UNIVERSIDADE ESTADUAL DE CAMPINAS
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MARCELO DE ARRUDA FABER

HISTERECTOMIA TOTAL VERSUS SUBTOTAL PARA CONDIÇÕES GINECOLÓGICAS BENIGNAS – UMA ATUALIZAÇÃO DA REVISÃO COCHRANE

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Dissertação apresentada ao Programa de Pós-Graduação em Tocoginecologia da Faculdade de Ciências Médicas da Universidade Estadual de Campinas como parte dos requisitos exigidos para a obtenção do Título de Mestre em Ciências da Saúde, área de concentração em Fisiopatologia Ginecológica

Dissertation submitted to the Post-Graduate Program in Obstetrics and Gynecology, School of Medical Sciences, University of Campinas as part of the criteria to obtaining the title of Master on Health Sciences, area of Gynecological Pathophysiology

ORIENTADOR: Prof. Dr. Luiz Gustavo Oliveira Brito
CO-ORIENTADORA: Profa. Dra. Cassia Raquel Teatin Juliato

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MARCELO DE ARRUDA FABER

ORIENTADOR: PROF. DR. LUIZ GUSTAVO OLIVEIRA BRITO

CO-ORIENTADOR: PROFA. DRA. CASSIA RAQUEL TEATIN JULIATO

MEMBROS:

1. PROF. DR. LUIZ GUSTAVO OLIVEIRA BRITO
2. PROFA. DRA. LUCIA HELENA SIMÕES DA COSTA PAIVA
3. PROF. DR. PAULO AUGUSTO AYROZA GALVÃO RIBEIRO

Programa de Pós-Graduação em Tocoginecologia da Faculdade de Ciências Médicas da Universidade Estadual de Campinas.

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RESUMO

Introdução: A retirada cirúrgica do útero por patologias ginecológicas benignas pode ser realizada com ou sem a remoção do colo uterino no mesmo tempo cirúrgico. A histerectomia total (HT) consiste na remoção do corpo e colo uterinos, já a histerectomia subtotal (HST) preserva o colo uterino. Ambos os procedimentos podem ser realizados por mais de uma via de acesso. Devido a maior dissecção envolvida na retirada do colo, acredita-se que a HST resulte menor repercussão nas estruturas adjacentes ao útero, trazendo menor morbidade para as mulheres a curto e a longo prazo. As funções urinária, sexual, intestinal e qualidade de vida podem ser afetadas caso o cirurgião opte pela HT ou HST. **Objetivos:** Comparar os resultados a curto e a longo prazo sobre os sintomas urinários, intestinais, função sexual e qualidade de vida da histerectomia subtotal com a histerectomia total devido a doenças ginecológicas benignas. **Métodos:** Atualização de uma revisão Cochrane. Foram selecionados ensaios clínicos randomizados dos seguintes bancos de dados: Cochrane Central Register of Controlled Trials, CENTRAL, MEDLINE, EMBASE, CINAHL, Biological Abstracts, National Research Register, a partir de dezembro de 2010 até dezembro 2019. Os artigos incluídos passaram por análise de risco de viés e a qualidade de evidência foi avaliada pelo sistema GRADE. Variáveis dicotômicas foram analisadas em Odds Ratio enquanto variáveis contínuas foram avaliadas pelas diferenças entre as médias, ambas com intervalo de confiança de 95%. O processamento de dados e a análise estatística foram realizados atraves do programa Review Manager **Resultados:** Um total de 2922 artigos foram encontrados na somatória das bases de dados; 35 artigos foram lidos de forma completa, e destes 8 foram selecionados e um artigo foi

adicionado das listas de referências, totalizando 9 artigos avaliados. Novos dados adicionados mostram um risco aumentado, a longo prazo, de desenvolver incontinência urinária de esforço após a realização de histerectomia subtotal abdominal (OR 1.53, 95% IC 1.08 a 2.18). A histerectomia subtotal abdominal apresentou, também, menor risco para febre (OR 0.48, 95% IC 0.31 a 0.75) e retenção urinária (OR 0.23, 95% IC 0.06 a 0.81) no pós-operatório recente. A histerectomia subtotal laparoscópica, em relação a histerectomia total laparoscópica, apresentou uma redução significativa do tempo cirúrgico (MD -16.61, 95% CI -30.50 to - 2.72) e menor tempo de retorno às atividades normais (MD -1.15, 95% CI -2.14 a -0.16). **Conclusão:** A HST possui um tempo menor de cirurgia tanto na via abdominal quanto na laparoscópica. A HST laparoscópica reduz o tempo de retorno as atividades normais em relação à HT laparoscópica. A HST abdominal reduz o risco de febre e retenção urinária no pós-operatório recente, porém aumentou o risco para incontinência urinária de esforço.

Palavras-chave: histerectomia total, histerectomia subtotal, incontinência urinária, função sexual, incontinência fecal, revisão sistemática; meta-análise

ABSTRACT

Introduction: the surgical removal of the uterus for benign gynecological diseases can be performed with or without the removal of the cervical stump. The total hysterectomy is the complete removal of uterus and cervical stump, the subtotal hysterectomy preserves the cervical stump. Both procedures can be done by more than one surgical access. Is believed that the subtotal hysterectomy could be a surgical choice of minimal damage to the adjacent structures since the cervical stump does not need to be removed, resulting in minor morbidity in short and long follow-up. Urinary, sexual, bowel function and quality of life may be compromised if the gynecologist chooses to perform a total or a subtotal hysterectomy. **Objective**: evaluate the short- and long-term results in benign gynecological conditions after total and subtotal hysterectomies. **Methods**: Update a Cochrane systematic review of randomized clinical trials selected from the following data base: Cochrane Gynaecology and Fertility Group Specialised Register of controlled trials, CENTRAL, MEDLINE, EMBASE, CINAHL, Biological Abstracts, National Research Register, and relevant citation lists. Risk of bias was assessed independently by two review authors and the quality of evidence was evaluated by the GRADE system Dichotomous data were expressed as an odds ratio and continuous data were expressed as the mean difference between groups, both with 95% confidence interval. All the data analysis was made by the Review Manager software. **Results**: 2922 studies were found at the databases, 35 full text reviews after initial abstracts screening and 8 selected. One additional study was selected from the refference lists. New data included shows a higher chance of stress incontinence in long term follow up of

subtotal abdominal hysterectomy (OR 1.53, 95% IC 1.08 to 2.18). Subtotal abdominal hysterectomy offers lower risk of fever (OR 0.48, 95% IC 0.31 to 0.75) and urinary retention (OR 0.23, 95% IC 0.06 to 0.81) in the immediate post-operative. Between laparoscopic hysterectomies, subtotal hysterectomy was faster (MD - 16.61, 95% CI -30.50 to - 2.72) and demanded less time to return normal activities (MD -1.15, 95% CI -2.14 to -0.16). **Conclusion**: Subtotal hysterectomy has shorter length of time required for surgery for both abdominal and laparoscopic routes. Laparoscopic subtotal hysterectomy has shorter time to resume normal activities than laparoscopic total hysterectomy. Abdominal subtotal hysterectomy has less chance of pyrexia and urinary retention at short term but increases chance of stress urinary incontinence at long term.

Keywords: total hysterectomy; subtotal hysterectomy; urinary incontinence; sexual function; fecal incontinence; systematic review; meta-analysis

SUMÁRIO

1. INTRODUÇÃO

1.1. Epidemiologia e histórico

A histerectomia é um dos procedimentos cirúrgicos mais realizados ao redor do mundo, sendo a segunda cirurgia mais frequente na rotina do tocoginecologista, atrás apenas do parto cesariano (1-4). No Brasil aproximadamente 100 mil histerectomias são realizadas por ano (5, 6), sendo o mesmo número aproximado do Reino Unido (7), enquanto nos Estados Unidos esse número sobe para quase 600 mil histerectomias por ano (3, 8) e, entre 2000 e 2004, as causas benignas para a realização da histerectomia neste país foram: leiomiomas uterinos sintomáticos (51.4%), sangramento uterino anormal (41.7%), endometriose (30%) e prolapso de órgãos pélvicos (18.2%) (2).

No período de 1998 a 2010, nos Estados Unidos, houve uma redução na taxa de histerectomias abdominais de 65% para 54% devido à promoção de técnicas menos mórbidas e algumas vezes mais rápidas (3). Esta queda se deve ao aumento da realização das técnicas cirúrgicas menos invasivas, além de técnicas não cirúrgicas para tratamento das condições que levavam à histerectomia como embolização de artérias uterinas, ablação endometrial histeroscópica e o uso dos dispositivos intra uterinos liberadores de levonorgestrel (5). A preferência de cirurgiões e pacientes pela abordagem abdominal parece ser cultural, uma vez que na Alemanha, Áustria e Suíça as taxas de histerectomia por via abdominal foram de 15.7%, 28% e 23.9% respectivamente no ano de 2012, sendo que nos EUA, no mesmo ano, a taxa foi de 56% (4).

A cirurgia consiste na retirada do corpo acompanhada ou não da remoção do colo uterino. Quando a remoção é completa, incluindo o colo uterino, tal procedimento é denominado histerectomia total (HT) enquanto a remoção cirúrgica poupando o colo uterino é chamada de histerectomia subtotal (HST), ou supra cervical em alguns países. A primeira descrição moderna de histerectomia eletiva foi realizada em 1813 por Conrad Langenbeck por via vaginal. Tal procedimento já era descrito em manuscritos gregos de Themison (50 AC) e Soranus (120 DC), mas esta foi a primeira vez que a cirurgia foi cientificamente registrada e com a sobrevivência da paciente após o procedimento (8, 9). A primeira histerectomia abdominal foi realizada 30 anos após, em 1843, por Charles Clay, porém, só em 1853, Burnham teve a primeira paciente a sobreviver a uma histerectomia (8). As causas mais frequentes de morte das pacientes submetidas à histerectomia nesta época eram sepse, peritonite, hemorragia e exaustão, não necessariamente nesta ordem. É necessário lembrar que durante todo o século XIX as técnicas anestésicas eram extremamente rudimentares e o primeiro antibiótico descrito data de 1893 (10, 11). Estas cirurgias e as próximas realizadas foram todas HST sendo a primeira HT abdominal realizada em 1929 por E.H. Richardson, logo acrescida da recém inventada incisão transversa de Johanns Pfannenstiel (12,13).

1.2. Vias de Histerectomia

A HT pode ser realizada pelas vias abdominal, vaginal ou, após Reich em 1989 (14), pela via endoscópica, sendo essa última via laparoscópica ou, mais recentemente, via robótica (4). As abordagens vaginal e laparoscópica podem ser realizadas simultaneamente, recebendo a denominação de histerectomia

vaginal vídeo assistida. Quando optando por preservar o colo uterino na técnica HST, a opção vaginal deixa de existir, pois um dos primeiros passos clássicos desta técnica consiste na ligadura e secção dos ligamentos cardinais e vasos sanguíneos laterais ao colo (2).

Além da experiência e habilidade do cirurgião, a opção por uma destas formas de abordagem deve levar em conta o tamanho, formato e mobilidade do útero, da elasticidade vaginal, do ângulo subpubico ou deformidades da pelve óssea e da existência de procedimentos adicionais que demandem uma abordagem específica. A opção da paciente deve ser sempre respeitada caso não acrescente risco ao procedimento (15, 16). As vias endoscópica ou vaginal são consideradas minimamente invasivas, por não demandar o trauma cirúrgico de uma incisão abdominal, são associadas a menor tempo de hospitalização e mais rápida recuperação pós cirúrgica (2). Por esses motivos, as duas são opções mais recomendadas caso a abordagem abdominal não seja mandatória (17).

Quando optado pela HT vaginal, a salpingectomia bilateral (remoção das duas tubas uterinas) pode não ser um procedimento fácil, pois é dificultada pela própria distância entre os anexos e a incisão de abertura, além de depender da mobilidade das mesmas, mas possui uma viabilidade de aproximadamente 80% (18). A salpingectomia bilateral é um procedimento fortemente recomendado devido as evidências de diminuição de risco para neoplasia ovariana em pacientes que tiveram as trompas removidas ao longo da vida (19). Já nas histerectomias abdominais e laparoscópicas, tal passo se tornou altamente recomendado dado a facilidade de abordagem e mínimo acréscimo de tempo cirúrgico (19).

A retirada do útero via laparoscópica, uma vez que não existe uma abertura na parede abdominal suficientemente grande para a passagem da peça cirúrgica, pode ser realizada pelo fundo vaginal seguido do seu fechamento ou pode ser realizada por um dos trocartes após o morcelamento da peça. O morcelamento consiste na destruição intra-abdominal de um órgão sólido seguido da sua aspiração através de um dos trocartes (20). Tal procedimento deve ser realizado de forma segura em relação a prevenção oncológica, evitando que fragmentos uterinos caiam na cavidade abdominal, o que poderia disseminar focos neoplásicos mecanicamente. Para tal, bolsas plásticas são inseridas na cavidade e toda a destruição do espécime é realizada dentro destas bolsas. Esta é uma opção para a HST laparoscópica, porém ainda demanda muito debate devido os seus riscos oncológicos (2, 4).

Tratamentos alternativos para as indicações mais comuns de histerectomia ganharam espaço nas últimas décadas, como a embolização da artéria uterina para diminuição de miomas uterinos sintomáticos, o uso de técnicas ablativas de endométrio para tratamento de sangramento uterino anormal (3, 4, 8) e o uso de técnicas cirúrgica para correção de prolapsos de órgãos pélvicos sem envolver a histerectomia (4). Acompanhando também essa linha de tratamentos, as sociedades de oncologia ginecológica vêm estabelecendo novos protocolos com preservação uterina para o tratamento de displasias e algumas neoplasias do colo uterino e para casos iniciais de hiperplasias endometriais (3).

Tais técnicas mais conservadoras ganharam espaço também devido à expectativa de se evitar alterações da circulação sanguínea local, secção de ligamentos de sustentação do assoalho pélvico e danos neurológicos, que são

situações inerentes ao procedimento cirúrgico (1, 2). Pensando nas possíveis repercussões destas lesões para as mulheres, muitos estudos começaram a avaliar a influência da histerectomia a curto e a longo prazo nos mais diversos órgãos adjacentes ao útero.

Antes de se pensar em técnicas terapêuticas que não envolvessem a remoção do corpo uterino ou que pudessem ser realizadas por vias menos invasivas, a simples dúvida entre se optar ou não pela remoção do colo uterino já estimulava a pesquisa científica. Tal opção surgiu com a queda da obrigatoriedade da realização da histerectomia total pensando em prevenção de câncer de colo uterino, que ocorre em menos de 0,1% das histerectomias subtotais (12, 21), frequência que deve diminuir ainda mais com a vacinação sistemática da população contra o papiloma vírus humano (HPV) iniciada nos últimos anos (22).

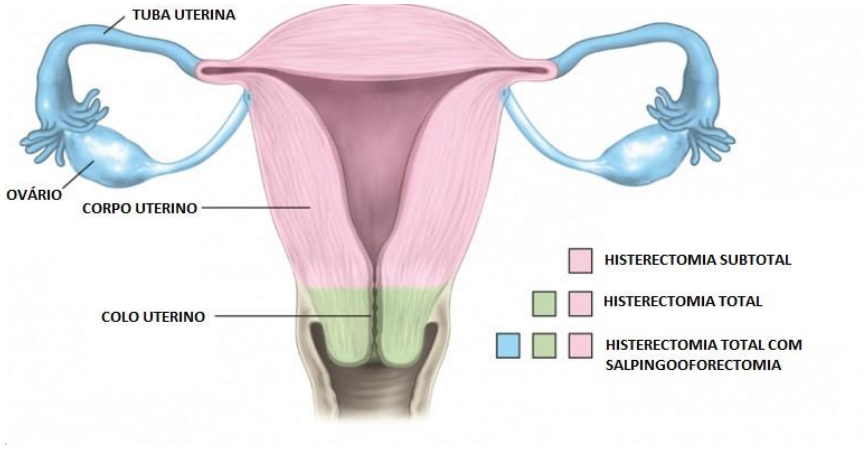

Figura 1 – Ilustração das estruturas removidas nos tipos de histerectomias
https://westlondongynaecologyclinic.co.uk/services/hysterectomy/

1.3. Remoção do colo ou não – fatores influenciadores e nível de evidência

Nas descrições clássicas das histerectomias total e subtotal é reportado que a opção pela preservação do colo é associada a menor mobilização da

bexiga e menor incidência de lesão de ureteres, hematoma de cúpula vaginal e deiscência de sutura de cúpula vaginal, além de ser considerada uma boa opção para cirurgias que demandem menor tempo cirúrgico (8, 12, 21). Pesquisadores nas últimas décadas se voltaram para a avaliação das funções sexuais, urinárias e intestinais das mulheres que realizaram uma ou outra técnica.

Diversos estudos e revisões da literatura avaliaram a resposta sexual das mulheres após a realização de histerectomia baseados na teoria de que o colo uterino teria alguma função na performance sexual das mulheres, porém nenhuma diferença foi encontrada entre as mulheres submetidas a HT ou a HST (16, 21, 23). Quanto a incontinência urinária e surgimento de prolapsos apicais pós histerectomia, teoricamente ambos aumentarão após o procedimento, sendo ainda mais frequentes após a histerectomia total. Tal pensamento se deve a teoria integral de Petros (24) que trouxe a comunidade científica a teoria de forças e contra forças que mantém a estática pélvica feminina, prevenindo prolapsos e incontinência caso esse balanço de forças esteja preservado. Estudos começam a questionar se a HST seria uma causa menos importante que a HT no surgimento da incontinência urinária (25).

Uma revisão da Cochrane de 2003, liderada por Anne Lethaby do Cochrane Gynaecology and Fertility Group (CGF), avaliou as diferenças encontradas em estudos que avaliavam as funções urinária, sexual e intestinal em mulheres submetidas a HT e HST, tanto a curto e a longo prazo (12). Foram avaliados ensaios clínicos randomizados que abordassem o tema integralmente ou parcialmente, sendo que apenas estudos de mulheres submetidas a histerectomia por condições ginecológicas benignas foram incluídas. Inicialmente os resultados foram avaliados nos pós-operatórios de 6, 12 e 24

meses, porém em 2011, ao se realizar uma atualização desta revisão, foram incluídos novos estudos com tempo de seguimento das pacientes muito superiores a dois anos. Por esse motivo, mudou-se o corte de avaliação, sendo condensado em curto prazo o período todo de 2 anos pós cirurgia e elevado a longo prazo toda avaliação realizada após 2 anos (12).

Um vasto banco de dados foi utilizado para levantar artigos publicados sobre o assunto, sendo que apenas os que cumpriam os pré-requisitos e tinham qualidade suficiente foram incluídos na análise inicial e na primeira atualização. Um total de 1533 mulheres foram avaliadas ao se somar os números de participantes dos estudos selecionados.

Esta revisão de Lethaby não encontrou diferenças na literatura em relação as funções urinária, sexual e intestinal entre pacientes submetidas a HT ou HST. Os fatores encontrados que favoreceriam a opção pela HST foram o menor tempo cirúrgico e a menor perda sanguínea, calculado em necessidade de transfusão sanguínea. Com o passar de quase uma década, fez-se necessária uma nova atualização desses dados encontrados em 2011. Novos estudos foram conduzidos e os resultados de longo prazo de estudos previamente feitos foram divulgados, podendo assim responder dúvidas sobre a orientação da remoção do colo durante processo de decisão para a histerectomia.

2. OBJETIVOS

2.1. OBJETIVO GERAL

Comparar os resultados a curto e a longo prazo da histerectomia subtotal versus histerectomia total para condições benígnas.

2.2. OBJETIVOS ESPECÍFICOS

- Avaliar a presença de sintomas urinários (incontinência de esforço, urgência micconal, disfunção de esvaziamento – esvaziamento incompleto) no pós-operatório de curto e longo prazo entre histerectomia subtotal versus histerectomia total
- Avaliar a função sexual no pós-operatório de curto e longo prazo entre histerectomia subtotal versus histerectomia total
- Avaliar a função intestinal (constipação e incontinência fecal) no pós-operatório de curto e longo prazo entre histerectomia subtotal versus histerectomia total
- Avaliar os desfechos intra-operatórios, qualidade de vida, readmissão e complicações entre histerectomia subtotal versus histerectomia total

3. MATERIAL E MÉTODOS

3.1 LOCAL

Estudo de atualização feito pela equipe da Divisão de Ginecologia, Departamento de Tocoginecologia da Universidade Estadual de Campinas (UNICAMP) com apoio e coordenação da Cochrane Library. Houve um cadastro do primeiro autor na plataforma Cochrane, conforme email (Anexo 1). Tendo em vista que o estudo em questão é uma revisão sistemática da literatura, termo de consentimento livre e esclarecido foi dispensado.

3.2 DESENHO DO ESTUDO

Trata-se de uma atualização de uma revisão sistemática Cochrane sobre resultados a curto e longo prazo da realização de histerectomia subtotal ou total. Existe uma parceria da base de revisões sistemáticas PROSPERO com a iniciativa COCHRANE, onde todas as revisões prévias são imediatamente consideradas para publicação (Anexo 2). Dessa forma, não houve necessidade de registro desse protocolo pois a mesma já apresentou edições prévias de publicação.

3.3 CRITÉRIOS DE INCLUSÃO E EXCLUSÃO

Foram incluídos ensaios clínicos randomizados (RCT) e atualizações de longo prazo de ensaios clínicos randomizados previamente avaliados pelo grupo de estudos Cochrane sobre mulheres submetidas a HT ou HST por doenças ginecológicas benignas. Foram excluídos estudos transversais, retrospectivos,

revisões sistemáticas, relatos de caso e metanálises. Estudos avaliando histerectomia em mulheres com câncer ginecológico.

3.4 SELEÇÃO DOS ESTUDOS

Um total de 2922 estudos foram selecionados para análise pela busca nos bancos de dados, deste total, 830 duplicatas foram excluídas, totalizando 2092 estudos para análise de resumos. Ao todo, 2057 estudos foram excluídos e 35 selecionados para análise completa. 27 trabalhos foram excluídos nesta fase por não cumprirem os critérios de inclusão ou por já terem sido incluídos ou excluídos nas primeiras atualizações desta revisão. Ensaios clínicos randomizados não encontrados nestas redes, porém listados nas referências de artigos previamente incluídos também foram analisados, sendo um novo artigo incluído desta forma. Ao total, nove artigos foram incluídos nesta nova atualização, sendo três RCT originais e seis artigos avaliando o seguimento a longo prazo (5 a 14 anos) de estudos originais previamente incluídos na revisão na primeira publicação e na primeira atualização de 2011 (Figura 1).

3.5 EXTRAÇÃO, PROCESSAMENTO E ANÁLISE DOS DADOS

A pesquisa foi realizada pelo coordenador de pesquisa de ensaios clínicos da Cochrane Gynaecology and Fertility Group (CGF) nas seguintes bases de dados: Cochrane Central Register of Controlled Trials, CENTRAL, MEDLINE, EMBASE, CINAHL, Biological Abstracts e National Research Register. Utilização da plataforma COVIDENCE para a avaliação dos resumos selecionados. Dois pesquisadores (M.A. Faber e L.G.O. Brito) foram responsáveis pela seleção dos

resumos para leitura do artigo completo e um terceiro avaliador (A. Lethaby) foi responsável por resolver qualquer desavença. Os dados extraídos dos artigos foram organizados em uma planilha própria.

O processamento de dados foi realizado através do programa Review Manager, versão 5.4, após término do treinamento específico para pesquisadores realizado na plataforma Cochrane. Apenas após a aprovação nos 8 níveis de treinamento foi iniciada a inserção de dados no programa. Tal inserção foi supervisionada pelo orientador durante todo o período do estudo.

3.6 VARIÁVEIS

3.6.1 PRIMARIAS

- Função urinária

- Incontinência de esforço – perda urinária aos esforços, tosse, espirro, referida pela mulher ou clinicamente diagnosticada por manobra de valsava ou cistometria.
- Incontinência de urgência - incontrolável vontade de urinar resultando ou não em perda urinária, referida pela mulher.
- Disfunções de esvaziamento (esvaziamento incompleto) – sensação de presença de urina após término da micção, referida pela mulher.

- Função intestinal

- Constipação – diminuição referida da frequência evacuatória para menos de 3 vezes por semana.

- Incontinência fecal – incapacidade de controlar a eliminação de fezes, referida pela mulher.

- Função sexual

- Dispareunia – dor durante a atividade sexual durante penetração, seja no introito, seja de profundidade, referida pela mulher.
- Satisfação, relacionamento e performance sexual.

3.6.2. SECUNDÁRIAS

- Qualidade de vida – calculada segundo o questionário validado SF-36

- Tempo cirúrgico – calculado em minutos

- Recuperação pós cirurgia

- Tempo de internação – em dias
- Retorno as atividades normais – em semanas

- Complicações pré alta hospitalar

- Lesão cirurgica – lesão inadvertida de trato urinário, intestinal ou de grandes vasos.
- Perda sanguínea (quantidade em mL) – estimada de forma visual ou através de aspiração inloco cirúrgico ou através de pesagem de compressas
- Necessidade de transfusão sanguínea
- Hematoma pélvico
- Sangramento vaginal

- Infecção urinária
- Qualquer outra infecção
- Febre
- Retenção urinária
- Obstrução intestinal

- Complicações intermediarias (após a alta até 2 anos pós cirurgia)

- Sangramento vaginal cíclico persistente
- Dor crônica
- Remoção do colo residual
- Prolapso pélvico – estágio 2 ou maior
- Câncer ginecologico

- Complicações tardias (> 2 anos pós cirurgia)

- Fístula urogenital
- Prolapso pélvico – estágio 2 ou maior
- Câncer ginecológico

- Melhora dos sintomas pré cirurgia

- Dor lombar
- Pressão pélvica
- Dor pélvica
- Sangramento uterino anormal

- Readmissão hospitalar (relacionada à cirurgia)

3.7 ANÁLISE DO RISCO DE VIÉS

A análise do risco de viés foi realizada separadamente pelos dois pesquisadores responsáveis pela seleção dos artigos (M.A FABER e L.G.O. BRITO) levando em consideração a qualidade reportada nos artigos usando a ferramenta de Julian Higgins. Os domínios avaliados foram: randomização (se foi realizada de forma correta como por programa computadorizado de randomização, por jogo de dados, por cara-e-coroa...), ocultação de alocação (se os dados estavam adequadamente ocultados, seja por envelopes numerados opacos, containers numerados...), cegamento das participantes, pesquisadores e auxiliares, existência de dados incompletos (se a falta de informações em determinados passos da análise estatística foram devidamente apontados, omissão seletiva de dados (se o estudo está livre de ocultações seletivas de dados indesejados ao autor) e existência de outros tipos de vieses. Cada domínio foi avaliado como: baixo risco (quando o estudo cumpre os critérios), risco incerto (se existe dúvida quanto o cumprimento dos critérios) e alto risco (quando o estudo não cumpre os critérios).

3.8 ANÁLISE DA QUALIDADE DE EVIDÊNCIA – SISTEMA GRADE

Após a análise do risco de viés, os estudos selecionados foram inseridos no Sistema GRADE para análise da sua qualidade de evidência científica.

3.9 ANÁLISE ESTATÍSTICA

Variáveis dicotômicas foram expressas através de Odds Ratio com intervalo de confiança de 95%. Variáveis ordinais foram transformadas em variáveis dicotômicas. Variáveis contínuas foram avaliadas segundo o guia

Cochrane Handbook for Systematic Reviews of Interventions e quando as suas médias e desvios padrões estavam disponíveis, foi calculada diferença entre médias dos grupos, com 95% de intervalo de confiança.

Os estudos foram avaliados quanto a presença de heterogeneidade entre os participantes, intervenções, resultados e duração do seguimento. Tal heterogeneidade foi avaliada pelo teste Chi² usando um valor de p inferior a 0.1 como valor de heterogeneidade significativa. O valor de I^2 também foi utilizado para graduar o grau de heterogeneidade entre os estudos, sendo I^2 de 25% representando baixa heterogeneidade, 50% sendo moderada e 75%, extrema. Variáveis dicotômicas foram combinadas para meta analise através do método Peto-modified Mantel-Haenszel pelo software RevMan. Já as variáveis contínuas foram combinadas pelo mesmo software através do método de variança inversa para estimar a junção das diferenças entre as médias.

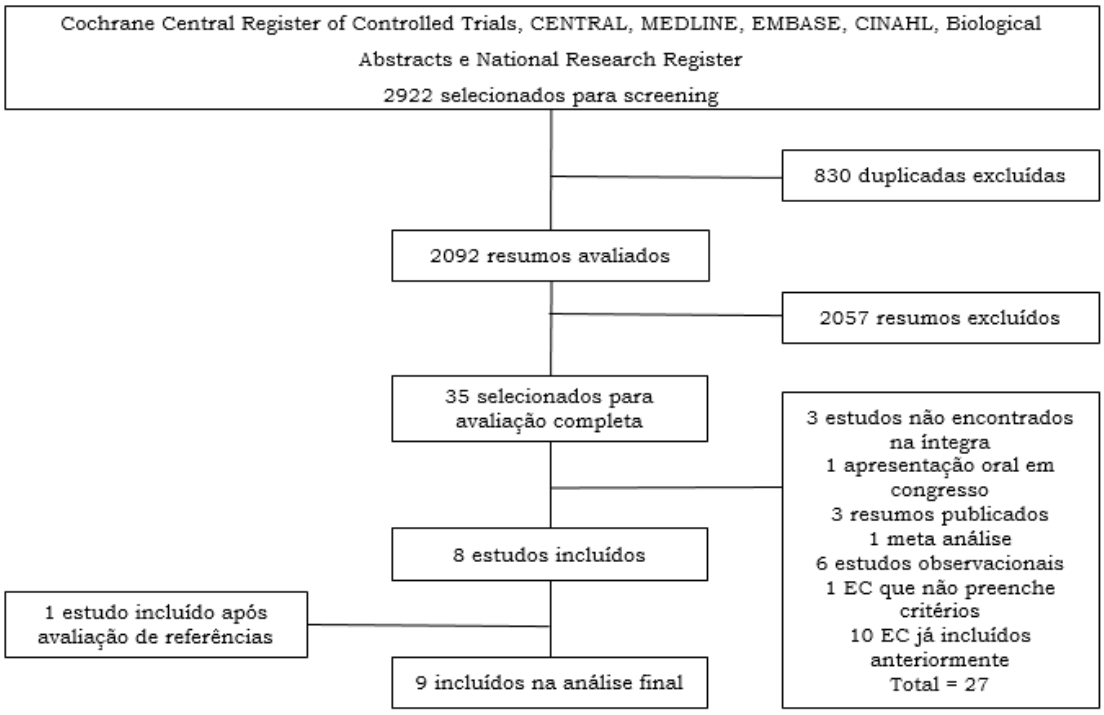

Figura 1. Fluxograma PRISMA.

4. RESULTADOS

Os dados dessa revisão foram parcialmente apresentados no Congresso Internacional de Uroginecologia (IUGA) esse ano (Anexo 3) em forma de short oral abstract e deram origem ao Artigo aqui apresentado – formato em e-proof preparado pela plataforma RevMan.

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Cochrane Database of Systematic Reviews

Total versus subtotal hysterectomy for benign gynaecological conditions (Review)

Faber M, Lethaby A, Naik R, Juliato C, Brito LG

Faber M, Lethaby A, Naik R, Juliato C, Brito LG.
Total versus subtotal hysterectomy for benign gynaecological conditions.
Cochrane Database of Systematic Reviews 2020, Issue 11. Art. No.: CD004993. DOI: 10.1002/14651858.CD004993.pub4.

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TABLE OF CONTENTS

[Intervention Review]

Total versus subtotal hysterectomy for benign gynaecological conditions

Marcelo Faber[1], Anne Lethaby[2], Raj Naik[3], Cássia Juliato[4], Luiz Gustavo Brito[5]

[1]Department of Gynaecology, State University of Campinas (UNICAMP), Campinas, Brazil. [2]Department of Obstetrics and Gynaecology, University of Auckland, Auckland, New Zealand. [3]Gynaecological Oncology, Northern Gynaecological Oncology Centre, Gateshead, UK. [4]Brazil. [5]Department of Gynecology and Obstetrics, State University of Campinas (UNICAMP), Campinas, Brazil

Contact address: Anne Lethaby, a.lethaby@auckland.ac.nz.

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10.1002/14651858.CD004993.pub4.

ABSTRACT

Background

Hysterectomy using an abdominal approach removes either the uterus alone (subtotal or supracervical hysterectomy) or both the uterus and the cervix (total hysterectomy). The latter is more common and there are controversies about the best strategy to be considered with regard to outcomes (sexual function, risk for urinary incontinence, pelvic organ prolapse, intraoperative complications) in the short and long-term.

Objectives

To compare short and long term outcomes of subtotal/supracervical hysterectomy (STH) with total hysterectomy (TH) for benign gynaecological conditions.

Search methods

We searched the Cochrane Menstrual Disorders and Subfertility Group Specialised Register of controlled trials (December 2019), CENTRAL (December 2019), MEDLINE (1966 to December 2019), EMBASE (1980 to December 2019), CINAHL (January 2005 to December 2019), Biological Abstracts (1980 to December 2005), the National Research Register and relevant citation lists. We also hand searched the reference lists of included studies and similar reviews.

Selection criteria

Only randomised controlled trials of women undergoing either total or subtotal hysterectomy for benign gynaecological conditions were included. whether performed by open, vaginal or laparoscopic/robotic approach.

Data collection and analysis

Independent selection of trials, assessment for risk of bias and data extraction were undertaken by two review authors. Quality of evidence was assessed by the GRADE criteria.

Main results

Nine trials including 1170 participants and long-term follow up studies of these trials were included. Within two years after surgery, there was no evidence of effect between STH and TH for stress urinary incontinence (odds ratio (OR)=1.45, (95% confidence interval (CI) 0.85 to 2.47), p=0.17, 5 studies, 955 women, moderate quality evidence), incomplete bladder emptying (OR=0.94, (95% CI 0.59 to 1.47), p=0.77,

4 studies, 768 women, moderate quality evidence), urinary urgency (OR=1.05 (95%CI 0.47 to 2.37),p=0.90, 2 RCTs, 254 women, moderate quality evidence), constipation (OR=0.80 (95% CI 0.49 to 1.31), p=0.38, 2 studies, 555 women, low quality evidence) and satisfaction with sex (OR=1.04 (95% CI 0.68 to 1.59), p=0.79, 2 studies, 454 women, moderate quality evidence). Dyspareunia and quality of life did not statistically differ between the groups. After two years of surgery, women that underwent STH presented a higher odds for stress urinary

incontinence (OR 1.53, (95% CI 1.08 to 2.18), p=0.02, 4 studies, 540 women, moderate quality evidence) than women with TH. Incomplete bladder emptying, urinary urgency, constipation, fecal incontinence, satisfaction with sex, dyspareunia and quality of life remained without statistically significant difference between groups. Operating time was shorter (mean difference (MD)=-13.11 minutes, (95% CI -17.56 to -8.66), p<0.001, 8 studies, 991 women) in the STH group (within abdominal, laparoscopic subgroups and combined analyses), as well as a smaller estimated blood loss during surgery (MD=-81.22 ml (95%CI -153.23 to -9.22), p=0.03, 5 studies, 780 women) and a shorter lenght of stay (MD=-0.24(95%CI -0.44 to -0.04), p=0.02, 7 studies, 1030 women) in the STH group. However, these differences are unlikely to constitute a clinical benefit. With regard to complications, post-operative fever (OR=0.48 (95% CI 0.31 to 0.75), p=0.001, 5 studies, 933 women) and urinary retention (OR 0.23, (95% CI 0.06 to 0.81), p=0.02, 5 studies, 933 women) were less like to occur in the STH group. However, ongoing cyclical vaginal bleeding up to two years after surgery was more likely (OR 12.18, 95% CI 5.58 to 26.60, p<0.0001, 7 studies, 1068 women) in the STH group versus TH. The odds for occurring pelvic organ prolapse did not differ between groups within 2 and 5 years after surgery (OR=1.16 (95%CI 0.52 to 2.58), p=0.71, 5 studies, 898 women) and after 5 years of surgery (OR=0.98 (95%CI 0.63 to 1.51), p=0.93, 3 studies, 445 women). No differences were also seen between the groups with regard to alleviation of pre-surgery symptoms (OR=1.09 (95%CI 0.72 to 1.64), p=0.69, 2 studies, 814 women) and readmission rates (OR=1.21 (95%CI 0.75 to 194), p=0.44, 6 studies, 1069 women). Trials comparing the laparoscopic route were underpowered to detect some differences.

Authors' conclusions

Differently from previous versions, TH seems to cause less stress urinary incontinence after two years of surgery when compared to STH. Women are more likely to experience ongoing cyclical bleeding up to a year after surgery with STH compared to TH. A shorter operative time and lenght of stay as well as a smaller estimated blood loss was also found in the STH group, although this statistcal difference may lack clinical significance.

P L A I N L A N G U A G E S U M M A R Y

Subtotal versus total hysterectomy

Hysterectomy is when we remove the uterus by surgery. Anatomically, the uterus consists of two parts, the uterine body and the cervix. When we plan a hysterectomy, we can remove just the uterine body (subtotal hysterectomy) or the uterine body and the cervix (total hysterectomy). It has been suggested that not removing the cervix (subtotal hysterectomy) would reduce the chances of sexual disorders, pelvic organ prolapse (bulging sensation on the vagina) or problems with passing urine or stools. This review has found no evidence of a difference between these two different operations for sexual and bowel function, but women that undergo total hysterectomy seems to have more stress urinary incontinence (urine loss during strain or effort). We have also found that surgery is faster for women that undergo subtotal hysterectomy and there is less blood loss during subtotal hysterectomy, although these benefits are still unknown for women when we discuss the clinical significance. Women that undergo subtotal hysterectomy are less likely to experience fever or urinary retention (difficult to void) after surgery but are more likely to have long-term ongoing menstrual bleeding when compared with women that undergo total hysterectomy. Futures studies are still needed to confirm some of the findings that have changed the results of the previous version.

SUMMARY OF FINDINGS

Summary of findings 1. Subtotal hysterectomy compared to total hysterectomy for benign gynaecological conditions

Subtotal hysterectomy compared to total hysterectomy for benign gynaecological conditions - Primary Outcomes

Patient or population: benign gynaecological conditions
Setting:
Intervention: Subtotal hysterectomy
Comparison: total hysterectomy

Primary outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	¼ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with total hysterectomy	Risk with Subtotal hysterectomy				
Prevalence of stress urinary incontinence within 2 years post surgery	Study population 52 per 1.000	74 per 1.000 (45 to 120)	OR 1.45 (0.85 to 2.47)	955 (5 RCTs)	⊕⊕⊕⊖ MODERATE [1]	
Prevalence of stress urinary incontinence >2 years post surgery	Study population 429 per 1.000	534 per 1.000 (448 to 620)	OR 1.53 (1.08 to 2.18)	540 (4 RCTs)	⊕⊕⊕⊖ MODERATE [1]	
Prevalence of incomplete bladder emptying within 2 years post surgery	Study population 115 per 1.000	109 per 1.000 (71 to 160)	OR 0.94 (0.59 to 1.47)	768 (4 RCTs)	⊕⊕⊕⊖ MODERATE [1]	
Prevalence of incomplete bladder emptying >2 years post surgery	Study population 217 per 1.000	158 per 1.000 (106 to 228)	OR 0.68 (0.43 to 1.07)	535 (4 RCTs)	⊕⊕⊕⊖ MODERATE [1]	
Prevalence of urinary urgency within 2 years post surgery	Study population 100 per 1.000	104 per 1.000 (50 to 208)	OR 1.05 (0.47 to 2.37)	254 (2 RCTs)	⊕⊕⊕⊖ MODERATE [1]	
Prevalence of urinary urgency >2 years post surgery	Study population		OR 1.05 (0.72 to 1.53)	536 (4 RCTs)	⊕⊕⊕⊖	

	369 per 1.000	380 per 1.000 (296 to 472)			MODERATE [1]
Prevalence of constipation within 2 years post surgery	Study population		OR 0.80 (0.49 to 1.31)	555 (2 RCTs)	⨁⨁◯◯ LOW [1,2]
	150 per 1.000	124 per 1.000 (80 to 188)			
Prevalence of constipation >2 years post surgery	Study population		OR 0.97 (0.55 to 1.70)	524 (3 RCTs)	⨁⨁⨁◯ MODERATE [1]
	111 per 1.000	108 per 1.000 (64 to 175)			
Prevalence of fecal incontinence >2 years post surgery	Study population		OR 0.63 (0.10 to 3.85)	294 (2 RCTs)	⨁⨁⨁◯ MODERATE [1]
	21 per 1.000	13 per 1.000 (2 to 76)			
Satisfaction with sex within 2 years post surgery	Study population		OR 1.04 (0.68 to 1.59)	454 (2 RCTs)	⨁⨁⨁◯ MODERATE [2]
	726 per 1.000	733 per 1.000 (643 to 808)			
Satisfaction with sex >2 years post surgery	Study population		OR 0.73 (0.43 to 1.23)	355 (2 RCTs)	⨁⨁⨁◯ MODERATE [1]
	446 per 1.000	370 per 1.000 (257 to 498)			

*__The risk in the intervention group__ (and its 95% confidence interval) is based on the assumed risk in the comparison group and the __relative effect__ of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio; **OR:** Odds ratio;

GRADE Working Group grades of evidence
High certainty: We are very confident that the true effect lies close to that of the estimate of the effect
Moderate certainty: We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different

Low certainty: Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect
Very low certainty: We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect

---

[1] Downgraded one level due to imprecision: number of events was lower than 300 (dichotomous outcome)
[2] Downgraded one level due to inconsistency: IT of 50% to 90%

Summary of findings 2. Subtotal hysterectomy compared to total hysterectomy for benign gynaecological conditions

Subtotal hysterectomy compared to total hysterectomy for benign gynaecological conditions - Secondary outcomes

Patient or population: benign gynaecological conditions
Setting:
Intervention: Subtotal hysterectomy
Comparison: total hysterectomy

Outcomes	Anticipated absolute effects* (95% CI)		Relative effect (95% CI)	¼ of participants (studies)	Certainty of the evidence (GRADE)	Comments
	Risk with total hysterectomy	Risk with Subtotal hysterectomy				
Prevalence of dyspareunia within 2 years post surgery	Study population 94 per 1,000	 79 per 1,000 (24 to 231)	OR 0.83 (0.24 to 2.90)	452 (2 RCTs)	⨁⨁⨁◯ MODERATE [1]	
Quality of life within 2 years post abdominal surgery (high better)	The mean quality of life within 2 years post abdominal surgery (high better) was 0	MD 0.12 higher (0.42 lower to 0.66 higher)	-	1961 (5 RCTs)	⨁⨁⨁◯ MODERATE [2]	
Quality of life within 2 years post abdominal surgery (low better)	The mean quality of life within 2 years post abdominal surgery (low better) was 0	MD 0.27 lower (1.39 lower to 0.84 higher)	-	663 (2 RCTs)	⨁⨁◯◯ LOW [2 3]	
Operating time (mins)	The mean operating time (mins) was 0	MD 13.11 lower (17.56 lower to 8.66 lower)	-	991 (8 RCTs)	⨁⨁⨁⨁ HIGH	
Length of hospital stay (days)	The mean length of hospital stay (days) was 0	MD 0.24 lower (0.44 lower to 0.04 lower)	-	1030 (7 RCTs)	⨁⨁⨁⨁ HIGH	
Return to normal activities (weeks)	The mean return to normal activities (weeks) was 0	MD 0.28 lower (0.64 lower to 0.08 higher)	-	355 (3 RCTs)	⨁⨁◯◯ LOW [1 2]	
Blood loss during surgery (mls)	The mean blood loss during surgery (mls) was 0	MD 81.22 lower (153.23 lower to 9.22 lower)	-	780 (5 RCTs)	⨁⨁⨁◯ MODERATE [1]	
Short term complications (predischarge)	Study population 48 per 1,000	 25 per 1,000 (19 to 34)	OR 0.51 (0.38 to 0.69)	5199 (6 RCTs)	⨁⨁⨁◯ MODERATE [2]	

Intermediate term complications (af- ter discharge and within 2 years post surgery)	Study population 87 per 1,000	OR 2.22 (1.15	3386 (7	⊕⊕⊖⊖ LOW [1]
Long term complications (>2 years post surgery)	Study population 318 per 1,000	OR 0.98 (0.63 to	445 (3 RCTs)	⊕⊕⊕⊖ MODE R- ATE
Alleviation of pre-surgery	Study population 148 per 1,000	OR 1.09 (0.72	814 (2	⊕⊕⊖⊖ LOW [2]
Readmission rate (related to	Study population 78 per 1,000	OR 1.21 (0.75	1069 (6	⊕⊕⊕⊕ HIG

*__The risk in the intervention group__ (and its 95% confidence interval) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RR:** Risk ratio; **OR:** Odds ratio;

GRADE Working Group grades of evidence
High certainty: We are very confident that the true effect lies close to that of the estimate of the effect
Moderate certainty: We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different
Low certainty: Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect
Very low certainty: We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect

[1] Downgraded one level due to inconsistency: Moderate heterogeneity
[2] Lack of blinding bias
[3] Downgraded one level due to imprecision: Small total sample size

BACKGROUND

Description of the intervention

Hysterectomy is the most frequently performed surgeries worldwide. A total hysterectomy involves the removal of both the uterine body and the cervix; a subtotal hysterectomy involves the removal of only the uterine body, leaving the cervix intact. Subtotal hysterectomy (STH) is also referred to as supracervical hysterectomy (SCH). In general, there has been a decline in the incidence of hysterectomies due to benign disease (Wright 2013).

The first reported elective hysterectomy was performed through a vaginal approach by Conrad Langenbeck in 1813. The first elective abdominal hysterectomy, a subtotal operation, was performed by Charles Clay of Manchester in 1863 (Sutton 1997). Subtotal abdominal hysterectomy remained the operation of choice until 1929, when Richardson performed the first total abdominal hysterectomy. Subsequent concerns over the potential for the development of cancer in a conserved cervix, combined with improvements in operative and anaesthetic techniques, meant that total hysterectomy almost completely replaced subtotal hysterectomy.

One of the few indications for subtotal hysterectomy was recto-vaginal endometriosis, which would have made removal of the cervix difficult or hazardous. However, consistent with developments in endometriosis surgery, it is now believed that retaining the cervix is likely to lead to residual disease and future symptoms. Therefore, subtotal hysterectomy should be seen as a relative contraindication for this type of endometriosis (Nezhat 1996). The other arguments presented in favour of subtotal hysterectomy include retaining the supporting structures of the uterus and vagina (cardinal and uterosacral ligaments) thereby in the long term reducing the risk of prolapse after a hysterectomy. In addition, by causing less damage to the nerves supplying the vagina, bladder and bowel, it is possible that subtotal hysterectomy might cause fewer urinary, bowel and sexual symptoms. For pelvic organ prolapse, there is also an assumption that maybe STH would maintain intact the pericervical ring, responsible for giving support to DeLancey's level I (Doshani 2007). A recent increase in the use of the laparoscopic approach to performing hysterectomies has led to an increase in numbers of subtotal procedures as well, as they would appear to be easier to perform than total hysterectomies. These proposed benefits of subtotal hysterectomy need to be reviewed and compared to outcomes with the standard procedure of total hysterectomy.

On the other hand, concern is often expressed regarding the risk of developing stump carcinoma of the cervix after performing subtotal hysterectomy. This has not been substantiated. The risk of cervical stump carcinoma in women with a previously normal Pap smear is no more than 0.3% (Storm 1992), approximately the same risk as for vaginal carcinoma after hysterectomy for a benign condition (Lyons 1993). However, caution should be taken so that women with subtotal hysterectomy fully understand the need for complying with the existing cervical screening program and they are not inappropriately excluded from screening.

How the intervention might work

Subtotal hysterectomy requires less dissection of surrounding tissue than total hysterectomy. Thus, there has been a suggestion it might be associated with:

- a reduced risk of bladder and ureter damage (Kilkku 1981; Parys 1990);
- a reduced risk of a post-operative pelvic haematoma (Nathorst- Boos 1992);
- a reduced risk of pelvic organ prolapse after surgery;
- better sexual function (Helstrom 1994); and
- less damage to neuro-anatomical structures compared to total hysterectomy (Thakar 2002), thereby preserving the nerve supply to vagina, bladder and bowel sphincters.

Both procedures could be considered to offer for patients.

Why it is important to do this review

Comparative rates of subtotal and total hysterectomy vary in different parts of the world. There has been some evidence of a resurgence in the use of subtotal hysterectomy, particularly in Scandinavia. In Sweden, the ratio of subtotal to total hysterectomy is 0.56 (Culhed 1993) and in Denmark, the number of total abdominal hysterectomies decreased by 38% and the number of subtotal hysterectomies increased by 458% during the years 1988 to 1998, by which time 22% of all hysterectomies were subtotal (Gimbel 2001). There has been a smaller rise in the proportion of subtotal hysterectomies performed in the United States from 0.7% in 1990 to 1.1% in 1993 (Farquhar 2002) and subsequently to 1.6% in 1997 and 7.5% in 2004 (Merrill 2008). Changes were more pronounced in California where the rate was 6.9% in 1994 and rose to 20.8% in 2003 (Jacobson 2006). In contrast, the rate in the United Kingdom remains very low with a ratio of only 0.04 (Gimbel 2005), although a UK survey suggests that the ratio of subtotal to total hysterectomy will increase in the future (Esdaile 2006). Given the wide global variation in rates, there is uncertainty about the potential advantages and disadvantages of subtotal hysterectomy when compared to a total procedure and a review is required to clarify the uncertainty. It is important to consider cultural and local factors that influence women's decision-making process.

OBJECTIVES

To compare short and long-term outcomes of subtotal hysterectomy with total hysterectomy for benign gynaecological conditions.

METHODS

Criteria for considering studies for this review

Types of studies

Randomised controlled trials (RCTs) where subtotal hysterectomy is compared with total hysterectomy, by any approach (laparoscopic, abdominal, vaginal or robotic/robotic-assisted laparoscopic) were eligible for inclusion. Prospective non-randomised studies and retrospective studies were excluded, as they present a high risk of bias.

Types of participants

Inclusion criteria

Women undergoing hysterectomy for benign gynaecological conditions. Subgroup analysis will be performed according to the indication for hysterectomy, if there are sufficient trials. Surgical approach will be also considered for subgroup analysis.

Exclusion criteria

Women with primary or metastatic gynaecological cancer.

Types of interventions

Two interventions are investigated: subtotal or supracervical versus total hysterectomy. No subgroups analyses regarding nerve-sparing techniques or other variations (extra versus intrafascicular technique, performing retrogade conization in the endocervical canal) were investigated. Moreover, the comparison of the surgical approaches to removing the uterus (abdominal versus vaginal, laparoscopic or robotic route) or adjuvant methods to improving intra-operative bleeding are the focus of another Cochrane review and such comparative trials will not be included in this review.

Types of outcome measures

After the publication of the protocol, the review authors decided to list outcomes according to their status as primary or secondary outcomes. In the 2011 update of the review, the outcomes were re-ordered and some new outcomes added. In the original review, outcomes were analysed at the time points six months, 12 months and 24 months, as described in the included studies. In the 'Implications for research' section of this review, the authors advised that longer term follow up was needed for full assessment of the comparative safety of subtotal versus total hysterectomy. In the 2011 update studies with longer term follow up (> five years post-surgery) were also considered eligible for the review. In order to avoid analysing too many outcomes in this update of the review, we have simplified the multiple follow-up times and defined 'short term' as outcomes occurring up to and including two years after surgery and 'long term' as outcomes occurring at longer follow-up times.

For some of the short term measures, for example, estimated blood loss, hospital stay and operating times, it is clinically relevant to assume that the outcome measures would be different when performed by the laparoscopic route as compared to the open approach. Also, compared to the original review, the more recent clinical trials are based on surgery by the laparoscopic route. Therefore, we have stratified the analysis under each outcome measure (both long term and short term) by the route of surgery, open or laparoscopic, where possible and wherever clinically relevant.

Studies were only included if they assessed one or more of the primary outcomes.

Primary outcomes

1. Urinary function

- stress urinary incontinence, defined as the involuntary loss of urine by effort, strain or cough, reported by the patient or objectively measured by Valsalva maneuver or cystometry.
- urinary urgency, defined as an irritative symptom and the uncontrolable desire to void, reported by the patient, with or without incontinence.
- voiding dysfunction (incomplete bladder emptying), as the sensation of not voiding completely, as if the patient felt that residual urine has remained in the bladder.

2. Bowel function

- constipation, described as having less than three bowel movements per week
- fecal incontinence, defined as the involuntary loss of stool by effort, strain or cough, reported by the patient

3. Sexual function

- Pain symptoms or dyspareunia (pain during sexual intercourse)
- Satisfaction, relationship and functioning combined

Secondary outcomes

1. Quality of life, defined by scores measured with any validated questionnaire. When multiple questionnaires were reported in studies, preference was given to SF-36, followed by any generic questionnaires and by condition-specific questionnaires.

2. Operative time (estimated in minutes)

3. Recovery from surgery

- length of hospital stay (days)
- return to normal activities (weeks)

4. Short term complications (pre-discharge)

- surgical injury (yes/no), defined as bladder, ureteral or intestinal injury
- estimated blood loss (amount in ml), defined by weighting gauzes or compresses or the volume aspirated by a suction cannister
- requirement for blood transfusion (yes/no)
- pelvic haematoma (yes/no)
- vaginal bleeding (yes/no), reported by the patient
- urinary tract infection (yes/no)
- any other infection
- pyrexia (fever)
- urinary retention
- bowel obstruction

5. Intermediate term complications (post-discharge, up to two years post-surgery)

- ongoing cyclical bleeding
- persistent pain
- removal of cervical stump
- pelvic prolapse, defined by POP-Q Stage 2 or more
- gynaecological cancer

6. Long term complications (> two years post-surgery)

- urogenital fistula
- pelvic organ prolapse, defined by POP-Q Stage 2 or more

- gynaecological cancer

7. Alleviation of pre-surgery symptoms

- back pain
- pelvic pressure
- pelvic pain
- menstrual abnormalities

8. Readmission to hospital (related to surgery), defined as the number of days since hospital discharge to the day that patient returns to the hospital and is decided that she needs to be interned.

Search methods for identification of studies

Electronic searches

The Trials Search Coordinator of the Cochrane Menstrual Disorders and Subfertility Group (MDSG) searched the following electronic databases for trials meeting the inclusion criteria:

- Cochrane Central Register of Controlled Trials (02/12/2019);
- MDSG specialised register (04/07/2011);
- MEDLINE (1966 to 02/12/2019);
- EMBASE (1980 to 02/12/2019);
- CINAHL (01/01/2005 to 02/12/2019);
- PsycINFO (01/01/2005 to 02/12/2019).

The search strategies for these searches are itemised in Appendix 1.

Searching other resources

1. AL searched the National Research Register (NRR), a register of ongoing and recently completed research projects funded by, or of interest to, the United Kingdom's National Health Service (NHS), as well as entries from the Medical Research Council's Clinical Trials Register, and details on reviews in progress collected by the NHS Centre for Reviews and Dissemination. The ClinicalTrials.gov register, a registry of federally and privately funded US clinical trials, was also searched.

2. The citation lists of relevant publications, review articles, abstracts of scientific meetings and included studies were also searched.

Data collection and analysis

Selection of studies

The independent selection of trials for inclusion in the review was performed by two review authors (VI and AL) in 2002, for the update in 2011 (AL and AM) and for the update in 2019 (MF and LB) after employing the search strategy previously described. DiNerences of opinion were to be resolved by consensus after consultation with a third review author (Cj) but this was unnecessary. A software was used for blinding selection (Covidence). Authors attempted to correspond with study investigators to clarify study eligibility when required. There were no limitations regarding language, publication date, or publication status.

Trials were excluded from the review if they did not meet the inclusion criteria and the references to these trials and the reasons for exclusion are listed in the table 'Characteristics of excluded studies'.

Data extraction and management

Data were extracted independently by two review authors, in 2002 (VI and AL), for the 2011 update (AL and AM) and for the update in 2019/2020 (MF and LB), using a form designed according to Cochrane guidelines. This information is presented in the table 'Characteristics of included studies' and provides a context for assessing the reliability of results. Any disagreements were solved by discussion. Additional information on trial methodology or actual original trial data were sought from the corresponding author of one trial which was initially published in a conference abstract but the information was subsequently published. Where studies had multiple publications, the authors collated multiple reports of the same study, so that each study rather than each report is the unit of interest in the review, and such studies had a single study ID with multiple references. We corresponded with study investigators for further data on methods and/or results, as required. The following information was extracted.

(1) Trial methods

1. Method of randomisation (either low risk, unclear risk or high risk)
2. Allocation concealment (either low risk, unclear risk or high risk)
3. Number of centres
4. Study design (parallel or crossover)
5. Blinding (of participants, investigators, assessors)
6. Number of participants randomised
7. Number of participants analysed
8. Methods used to describe missing data
9. Whether a power calculation was performed and adhered to 10.Whether 'intention-to-treat' analysis was performed by authors,
   possible from data but not performed by authors, not possible or uncertain
11. Source of funding stated or not

(2) Characteristics of the studyparticipants

1. Inclusion criteria
2. Exclusion criteria
3. Age of participants
4. Source of participants

(3) Interventions

1. Approach to hysterectomy - abdominal, vaginal, laparo-vaginal, laparoscopic, robotic
2. Timing of follow-up assessments after surgery

(4) Outcomes

1. Methods for measuring urinary, bowel and sexual function
2. Methods for measuring quality of life

Assessment of risk of bias in included studies

Risk of bias was assessed independently by two review authors (AL and AM) during the 2011 review and for the update in 2019/2020 (MF and LB), using the risk of bias tool developed by Julian Higgins (Higgins 2011). The following domains of the risk of bias tool were assessed:

- sequence generation (whether the allocation sequence was adequately generated, for example, random number table, computer random number generator, coin tossing, throwing dice);
- allocation concealment (whether the allocation was adequately concealed, for example, sequentially numbered containers of identical appearance, central allocation, sequentially numbered opaque sealed envelopes);
- blinding of participants, personnel and outcome assessors (whether knowledge of the allocated intervention was adequately prevented during the study, for example, by ensuring blinding of participants and key personnel or, where there is no blinding, knowledge of the intervention is not likely to influence the outcomes);
- incomplete outcome data (whether incomplete outcome data were adequately addressed, for example, missing data balanced in numbers across intervention groups, proportion of missing outcomes not sufficient to affect estimates, reasons for missing data unlikely to be related to the outcomes);
- selective outcome reporting (whether the reports of the study were free of suggestion of selective outcome reporting, for example, previous publication of a study protocol, other evidence that the study contains all of the prespecified outcomes);
- other sources of bias (whether the study was apparently free of other problems that could put it at a high risk of bias, for example, baseline imbalance, bias related to study design, early termination of the study).

Each domain was scored as either:

- low risk (criterion met);
- unclear risk (unclear whether criterion met);
- high risk (criterion not met).

The individual scores for each included study are found in the table 'Characteristics of included studies'. A summary is also included in Figure 1, and in graphic form in Figure 2. We took care to search for within-trial selective reporting, such as trials failing to report obvious outcomes, or reporting them in insufficient detail to allow inclusin. We have sought published protocols and compared the outcomes between the protocol and the final published study.

Figure 1. Methodological quality summary: review authors' judgements about each methodological quality item for each included study.

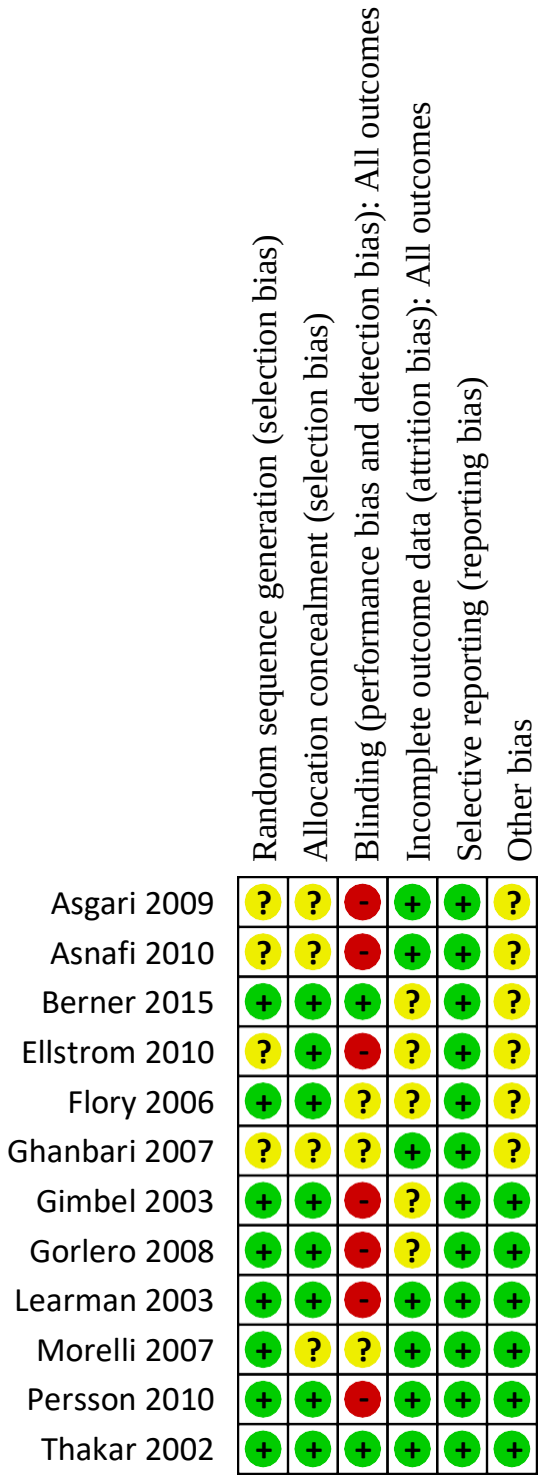
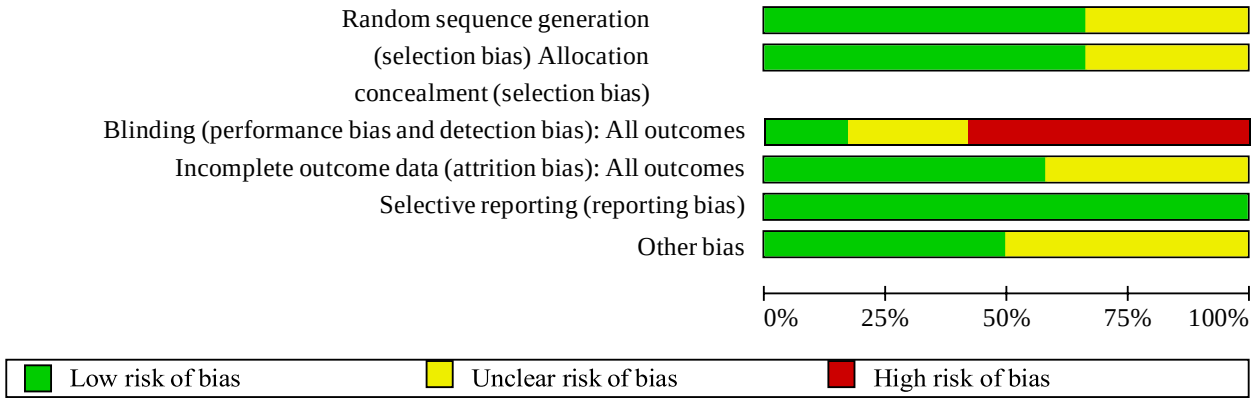


Figure 2. Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.



statistic was also checked to determine the percentage of total

Measures of treatment e6ect

Dichotomous data were expressed as an odds ratio with 95% confidence interval. Where ordinal data were used to measure outcomes, for example, satisfaction rates, the categories were collapsed and the data dichotomised. The distributions of continuous data from the included studies were inspected for evidence of skew according to guidance from the *Cochrane Handbook for Systematic Reviews of Interventions*. If means and standard deviations (SDs) were available, or could be calculated, continuous data were expressed as the mean difference between groups with 95% confidence interval, or if similar outcomes were reported in different scales, the standardized mean difference (SMD). Where there was strong evidence of skew in continuous data, results from the trial were not meta-analysed but expressed in narrative format in the text of the review.

Unit of analysis issues

The primary analysis was per randomized woman. However, this review is incorporating studies of long duration, and results were presented for several periods of follow-up. Therefore, it was defined a cut-off point for long-term outcomes (over 2 years) and we have selected the longest follow-up data from each study.

Dealing with missing data

Reasons for missing data in the included studies were documented and are included in the table 'Characteristics of included studies'. An assessment was made in the 'Risk of bias' table for each study whether the missing data in the trial were likely to affect the calculation of summary effect estimates.

Assessment of heterogeneity

The included studies were carefully inspected for evidence of clinical heterogeneity, in either the characteristics of the participants, the interventions, the outcomes or the trial duration. Where pooling the studies was appropriate, statistical heterogeneity between the results of different studies was examined by inspecting the scatter in the data points on the graphs and the overlap in their confidence intervals and, more formally, by checking the results of the Chi^2 test, using a P value of less than 0.10 as evidence of significant heterogeneity. The I^2

variation across studies that was due to heterogeneity rather than chance (Higgins 2003). These values can be categorised as follows: an I^2 of 25% represents mild heterogeneity, 50% represents moderate heterogeneity and 75% or more is evidence of extreme heterogeneity. In cases with extreme statistical heterogeneity which could not be explained by differences between studies, the estimates were not pooled in the meta-analyses.

Assessment of reporting biases

It was planned to check for evidence of publication bias by assessment of the amount of asymmetry in a funnel plot. However, there were insufficient number of trials identified to undertake this assessment.

Data synthesis

The outcome data were pooled in a meta-analysis where no significant clinical heterogeneity was apparent and there was no evidence of a major skew in the data.

Dichotomous data were combined for meta-analysis with RevMan software using the Peto-modified Mantel-Haenszel method to estimate pooled odds ratios. For negative outcomes (for example, urinary incontinence) an increase in the odds of a particular outcome for the experimental group (total hysterectomy) is displayed graphically in the meta-analyses to the right of the centre-line and a decrease in the odds of an outcome is displayed graphically to the left of the centre-line. For positive outcomes (for example, satisfaction with treatment) an increase in odds is shown on the reverse axis. Graphs have been labelled for ease of interpretation. Forest plots were built for outcomes with at least two studies that could be pooled.

Continuous data were combined for meta-analysis with RevMan software using an inverse variance method to estimate the pooled mean difference (MD) with 95% confidence interval. Fixed-effect models were used in the meta-analysis, except when there was a high heterogeneity.

Subgroup analysis and investigation of heterogeneity

Subgroup analysis was planned according to:
(a) indication for hysterectomy;
(b) time of follow up;

(c) hysterectomy approach (abdominal, laparoscopic, vaginal or robotic).

There were insufficient trials to undertake subgroup analysis according to indication for hysterectomy, but subgroups were used for separate analyses of those trials using abdominal procedures and those using laparoscopic procedures. Separate comparisons were made of outcomes assessed prior to two years post-surgery and outcomes assessed after two years post-surgery.

Statistical heterogeneity was assessed by the Chi^2 test (with $P < 0.1$ as evidence of significant heterogeneity) and the I^2 statistic. Where I^2 was found to be greater than 50%, sensitivity analysis was planned to compare results: we rechecked data and performed a random-effects meta-analysis.

Sensitivity analysis

It was planned to perform sensitivity analyses to examine the stability of the results in relation to:
(a) allocation concealment (adequate versus all trials);
(b) source of data (published only versus all trials);
(c) prior experience of the surgeon (experienced versus all trials).

There were insufficient trials to undertake these analyses. As non-randomised studies were excluded from the review, a sensitivity analysis could not be done to compare non-randomised versus randomised studies. Moreover, as we did not present many RCTs with unclear or high risk of bias, we decided not to undergo a sensitivity analysis on this regard.

Overall quality of the body of evidence: "Summary of findings" (SOF) table

We prepared two SOF tables (one for primary outcomes and other for secondary outcomes) using GRADEpro software. This table evaluated the overall quality of the body of evidence for the review outcomes, using GRADE criteria (study limitations (i.e. risk of bias), consistency of effect, imprecision, indirectness and publication bias) - Summary of findings 1 and Summary of findings table 2.

RESULTS

Description of studies

Results of the search

We identified 10 trials that were potentially relevant to the original publication of the review. Of these 10 studies, three were excluded, one because it was not randomised (Lyons 1993) and two because they did not measure any of the major outcomes in the review (Lalos 1986; Showstack 2004). Of the seven remaining studies, four were subsequent publications of a primary study (mostly assessing different outcomes from the primary publication). Thus, three RCTs met our inclusion criteria and were included in the original publication of the review.

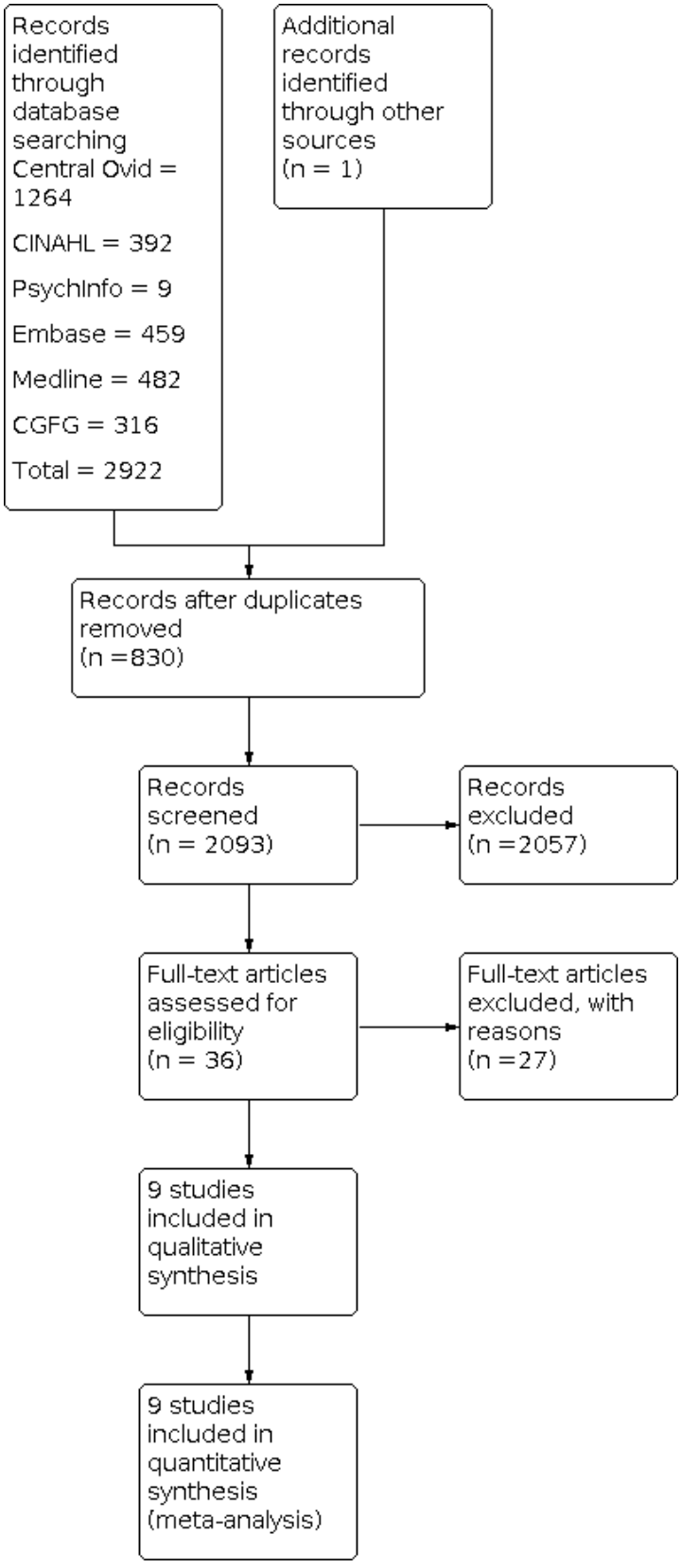
For the 2011 update, an additional 15 trials were identified that were potentially relevant to the review. Of these 15 studies, two were excluded because they were meta-analyses, one was excluded because it was a guideline, one was excluded because it was not randomised, and two were unobtainable and have been included in the awaiting classification section of the review. Of the remaining nine trials, one was a duplicate, one was a longer term follow up of a trial already included, one was a publication giving more details of a trial already included and six were new trials.

Ten studies were identified as potentially relevant to the review for the 2020 update. One was excluded because it was a poster abstract published in an international journal and the full study was not sent by the author after direct contact. Of the remaining nine trials, three were new trials and the other six were longer follow-ups of trials already included at the review.

Included studies

For the 2011 update, nine trials met the inclusion criteria and were included in the review. The nine trials randomised a total of 1553 women, but not all participants were included in the analysis of every outcome. For the 2020 update, nine other trials were included in the review, with the data of 1170 women. Figure 3 depicts the pathway of the selected studies. From 2922 retrieved studies, 830 were excluded as duplicates, 2093 were screened and 36 were eligible for full-text analysis; of these manuscripts, nine were included for the analysis.

Figure 3. Study flow diagram.



Study design

All trials were randomised parallel group studies. Eight trials were undertaken in a single centre, one trial involved 11 different centres in Denmark, one trial involved eight different centres in Sweden, one trial had four different centres in the US and one trial had two different centres in the UK. Two trials were undertaken in North America, two in Italy, two in Sweden, one in Denmark, three in Iran, one in Norway and one in the UK. Power calculations for sample size were reported for eight of the included studies and were appropriate (although one study was concluded prematurely because of difficulties in recruitment); for the other two trials it was not clear whether power calculations were undertaken.

Six studies claimed that analysis of outcomes was by intention to treat. One study had true intention to treat for the primary outcomes but minimal loss to follow up for secondary outcomes (Learman 2003). Another study performed four analyses: 'regular' intention to treat (based on outcome data only for those participants whose results were known, that is, excluding exclusions from the analysis and those lost to follow-up); 'best case scenario' intention to treat (the analysis considered all randomised participants and estimated dropouts as not having the primary undesirable outcome of interest); 'worst case scenario' intention to treat (the analysis considered all randomised participants and estimated dropouts as having the primary undesirable outcome of interest); and 'carry forward' intention to treat (analysis considered the last registered information on the outcome of interest among those dropping out as being the result at the end of the study period). Conclusions were based on the 'regular' intention to treat analysis, which excluded 13.2% of participants after randomisation (Gimbel 2003). Two studies (Thakar 2002; Morelli 2007) assessed peri-operative outcomes, but not other outcomes, in full intention-to-treat (ITT) analyses. Dropouts and withdrawals, where reported, were similar between randomised groups but analysis of the primary outcomes was only undertaken where data were available. Two other studies claiming ITT analyses (Ellstrom 2010; Persson 2010) had exclusions from all analyses that were similar between randomised groups. Three studies did not have any ITT analyses and for two other studies ITT analysis was not reported. There was no evidence that funding of the trials was from groups that could have benefited from the results of the studies; eight trials reported the source of their funding and two did not report how funding was provided. Follow up after surgery ranged from six to seven months (Flory 2006; Asnafi 2010), one year (Gimbel 2003; Gorlero 2008; Ellstrom 2010; Persson 2010; Berner 2015), two years (Learman 2003; Morelli 2007; Ghanbari 2007; Asgari 2009) to five to 14 years (Thakar 2002; Gimbel 2003; Learman 2003; Persson 2010).

Participants

Two of the studies specified that participants needed to be between 30 and 50 years of age with evidence that they were pre-menopausal (follicle stimulating hormone (FSH) ≤ 30 mIU/mL) (Learman 2003; Morelli 2007), one study required participants to be less than 60 years (Thakar 2002), three studies enrolled only pre-menopausal women (Asnafi 2010; Ellstrom 2010; Berner 2015), one study required participants to be between 18 and 55 years (Flory 2006), one study accepted participants aged less than 75 years (Gorlero 2008) and two studies did not mention age criteria (Gimbel 2003; Persson 2010). The mean age of the women in the trials varied from 42 to 49 years, although one study undertook longer follow up (an average of nine years after surgery). All women were eligible for hysterectomy for benign conditions, mostly fibroids or heavy menstrual bleeding. Women were excluded if they had known or suspected malignant conditions or other pathology. Two trials (Thakar 2002; Gorlero 2008) excluded women with known endometriosis. One study (Berner 2015) excluded women with know deep endometriosis and the preoperative need of removal of both ovaries.

Interventions

Six studies compared total abdominal hysterectomy with subtotal abdominal hysterectomy (Thakar 2002; Gimbel 2003; Learman 2003; Gorlero 2008; Asnafi 2010; Persson 2010); for three studies the procedures were performed laparoscopically (Flory 2006; Morelli 2007; Berner 2015) and for one study the decision whether to use an abdominal, vaginal or laparoscopic approach was left to the surgeon (Ellstrom 2010). Two of the studies using the abdominal route specified that the total hysterectomy be done by the clamp-cut-ligate method (Kaser 1985) with polyglycolic sutures and antibiotic prophylaxis, and that the endocervical canal be electrocoagulated (surgical coagulation of tissue by an electrical heat process) after removing the uterus in subtotal hysterectomy. No other detailed instructions were provided and the remaining studies allowed surgeons to perform the operations using their customary techniques. Seven trials did not include any information on the experience or number of surgeons performing the procedures, one trial stated that only experienced surgeons were used (Thakar 2002) and one other trial stated that all the laparoscopic operations were performed by one experienced surgeon who was a consultant (Gorlero 2008). No studies using the robotic-assisted laparoscopic approach were found.

Outcomes

In one trial, the primary outcomes were various measures of peri-operative morbidity and sexual function at one and two years (Learman 2003), another trial assessed the effects of surgery on a wide range of urinary tract symptoms at one year follow up (Gimbel 2003), another assessed psychological wellbeing and sexual function together with clinical outcomes at one year (Persson 2010), and another evaluated measures of bladder, bowel and sexual function in detail both at one year and at an average of nine years follow up (Thakar 2002). For two other trials, the primary outcomes were satisfaction, sexual activity, body image and health status at one year follow up (Gorlero 2008; Ellstrom 2010), another assessed psychosocial functioning (defined as sexual, pain and psychological outcomes) at six months follow up (Flory 2006), another assessed sexual function as well as clinical outcomes at six months follow up (Asnafi 2010), one trial evaluated cyclic pelvic pain reduction, pelvic organ proplapse and vaginal bleeding at one year follow-up (Berner 2015) and the remaining trial measured a wide range of outcomes, pelvic and urinary symptoms, surgical complications and clinical outcome, at two years follow up (Morelli 2007).

Risk of bias in included studies

Each included study was assessed for risk of bias (see 'Risk of bias' tables after each study in the table 'Characteristics of included studies').

Allocation

Most included studies allocated participants randomly into groups using computer generated numbers; in two studies the method of randomisation was not reported (Asnafi 2010; Ellstrom 2010). Four studies used block randomisation (Gimbel 2003; Learman 2003; Flory 2006; Persson 2010). Eight studies had adequate concealment of allocation (Thakar 2002; Gimbel 2003; Learman 2003; Flory 2006; Gorlero 2008; Ellstrom 2010; Persson 2010; Berner 2015).

Blinding

One study (Thakar 2002) blinded participants and investigators for the first year of the study. Although self examination by participants could break the blinding, this was strongly discouraged and the investigators considered that the women were highly motivated and willing to participate in the interests of the study. One study (Berner 2015) blinded only participants for one year follow-up. Two other studies did not report whether blinding was undertaken, but it was considered unlikely (Asnafi 2010; Morelli 2007). Eight studies reported that there was no blinding (Learman 2003; Flory 2006; Gimbel 2003; Ghanbari 2007; Gorlero 2008; Asgari 2009; Ellstrom 2010; Persson 2010).

Incomplete outcome data

Four studies adequately addressed their incomplete data by clearly specifying reasons for dropouts, which were balanced between groups and thus unlikely to affect estimates (Thakar 2002; Learman 2003; Morelli 2007; Persson 2010). For five other studies, there was either insufficient reporting of attrition and exclusions to permit judgments of whether incomplete data were adequately addressed or incomplete data were substantial (> 20%) (Gimbel 2003; Flory 2006; Gorlero 2008; Ellstrom 2010; Berner 2015). In one study it appeared that there were no exclusions after randomisation (Asnafi 2010).

Selective reporting

No protocols were identified to check whether all specified outcomes were reported. However, all studies reported the results of the pre-specified outcomes in the methods sections of their publications.

Other potential sources of bias

Seven of the included studies had no evidence of other potential sources of bias. One study (Flory 2006) reported a greater percentage of women with fibroids in the group that had subtotal hysterectomy compared to the group that had total hysterectomy. Another study (Asnafi 2010) analysed outcomes only in subgroups of women who were sexually active or who had previous dyspareunia.

E6ects of interventions

See: **Summary of findings 1** Subtotal hysterectomy compared to total hysterectomy for benign gynaecological conditions; **Summary of findings 2** Subtotal hysterectomy compared to total hysterectomy for benign gynaecological conditions

Where relevant, analyses of outcomes were subgrouped according to type of surgery, abdominal or laparoscopic. Separate comparisons were made of outcomes measured up to two years after surgery (with the later time interval used where outcomes were measured at multiple time intervals) and outcomes measured greater than two years after surgery (all measured at a mean of nine years after surgery).

Primary outcomes

Urinary function

There was no evidence of a statistically significant difference between STH versus TH with regard to the prevalence of stress urinary incontinence within 2 years (Figure 4) of the surgery (OR 1.45, 95% CI 0.85 to 2.47; 5 studies; i^2:0%, moderate quality of evidence); incomplete bladder emptying (within 2 years: OR 0.94, 95% CI 0.59 to 1.47, four studies, moderate quality of evidence, i^2:22% (Figure 5); > 2 years: OR 0.68, 95% CI 0.43 to 1.07, 4 studies, i^2:0%, moderate quality of evidence (Figure 6) or urinary urgency (within 2 years: OR 1.05, 95% CI 0.47 to 2.37, 2 studies, i^2:0%, moderate quality of evidence (Figure 7); > 2 years: OR 1.05, 95% CI 0.72 to 1.53; 4 studies, i^2:0%, moderate quality of evidence (Figure 8)). However, the 2020 review found a statistically significant difference in the prevalence of stress urinary incontinence after 2 years that slightly increases the risk for the STH group in the open abdominal approach (OR 1.53, 95% CI 1.08 to 2.18; 4 studies, i^2:0%, moderate quality of evidence (Figure 4)); no laparoscopic studies were included in this analysis. Moreover, there was also no evidence of statistically significant differences between groups when performing a subgroup analysis according to the surgical route. There was moderate heterogeneity (i^2:22%) in the comparison of the abdominal subtotal with total hysterectomy with respect to incomplete emptying.

Figure 4. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.1 Prevalence of stress urinary incontinence within 2 years post surgery.

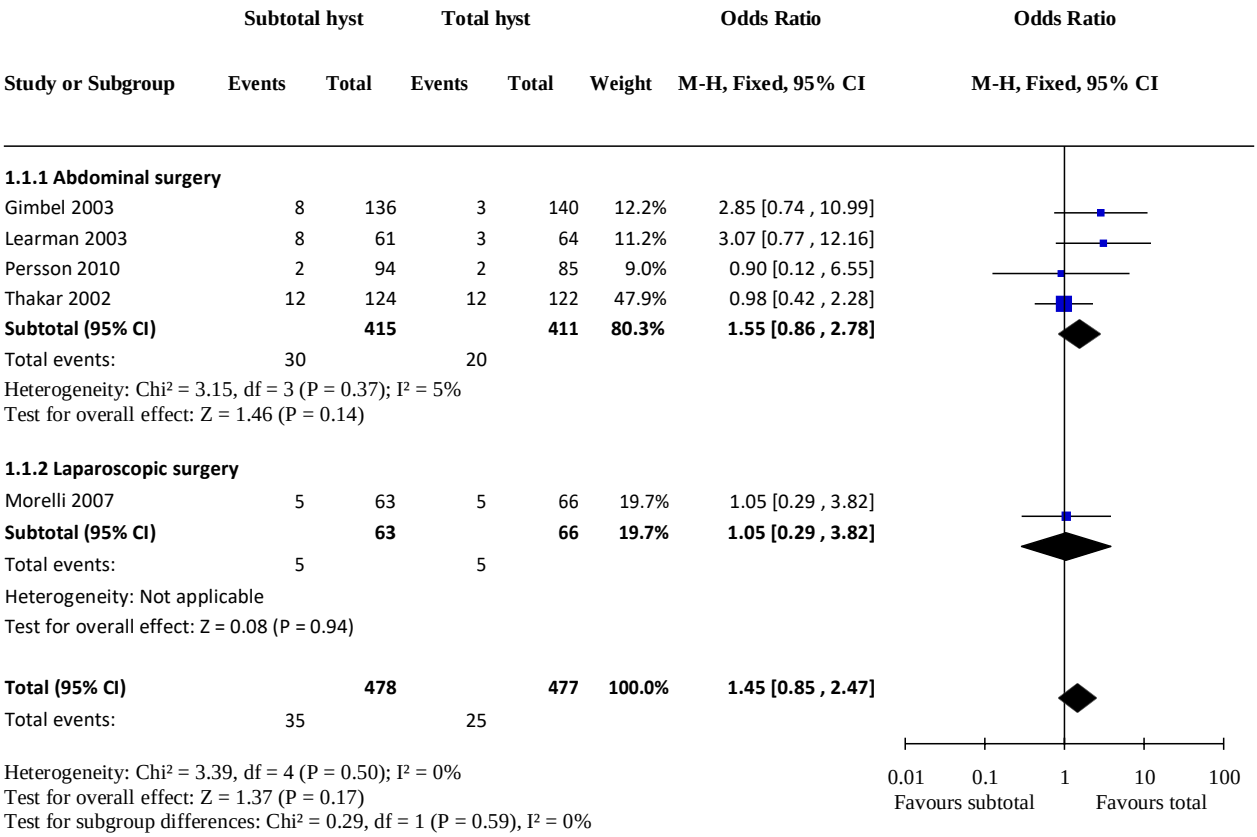
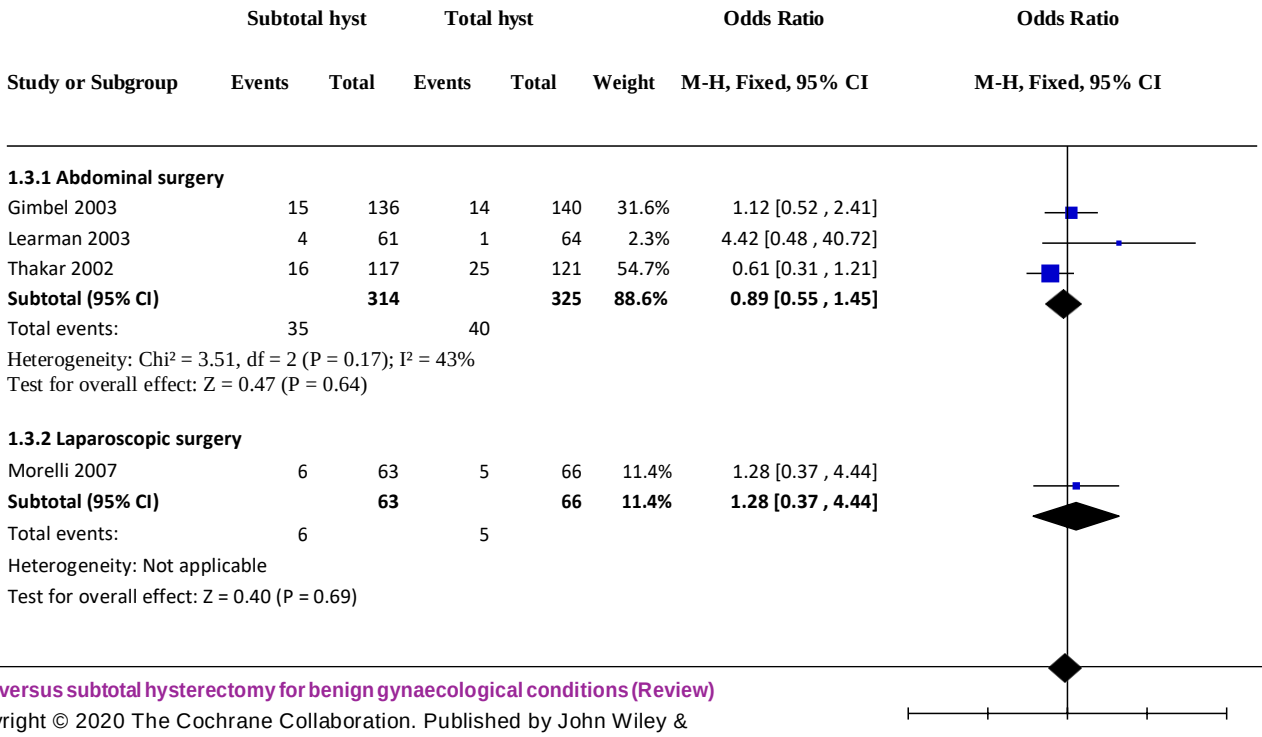


Figure 5. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.3 Prevalence of incomplete bladder emptying within 2 years post surgery.



Total (95% CI)	**377**	**391**	**100.0%**	**0.94 [0.59 , 1.47]**	
Total events:	41	45			

Heterogeneity: Chi² = 3.84, df = 3 (P = 0.28); I² = 22%
Test for overall effect: Z = 0.29 (P = 0.77)
Test for subgroup differences: Chi² = 0.29, df = 1 (P = 0.59), I² = 0%

0.01 0.1 1 10 100
Favours subtotal Favours total

Figure 6. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.4 Prevalence of incomplete bladder emptying >2 years post surgery.

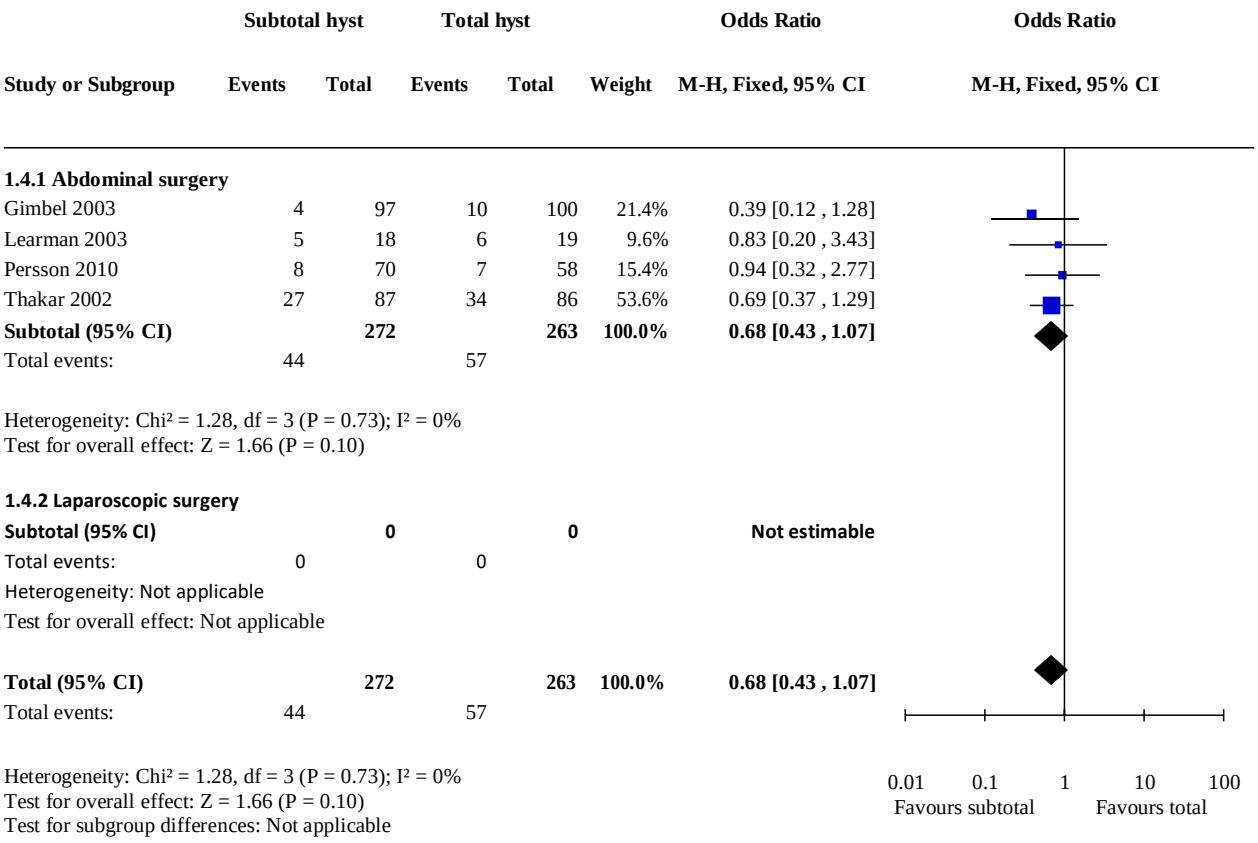
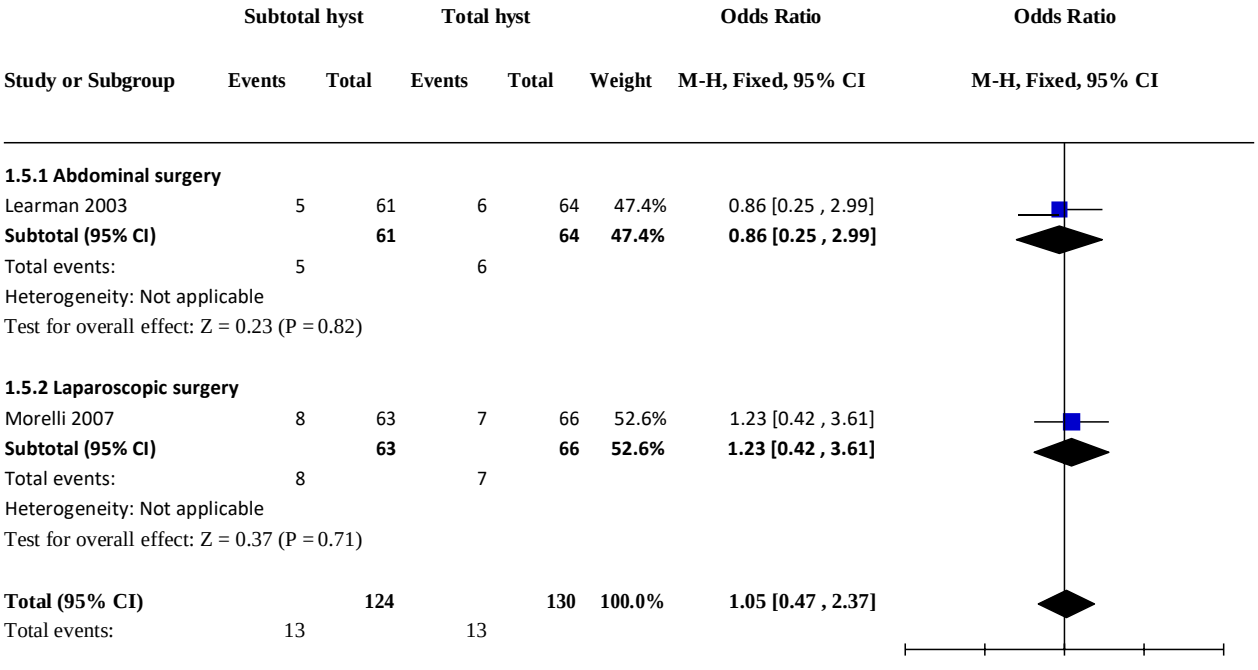


Figure 7. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.5 Prevalence of urinary urgency within 2 years post surgery.



Heterogeneity: Chi² = 0.17, df = 1 (P = 0.68); I² = 0%
Test for overall effect: Z = 0.13 (P = 0.90)
Test for subgroup differences: Chi² = 0.17, df = 1 (P = 0.68), I² = 0%

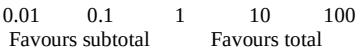
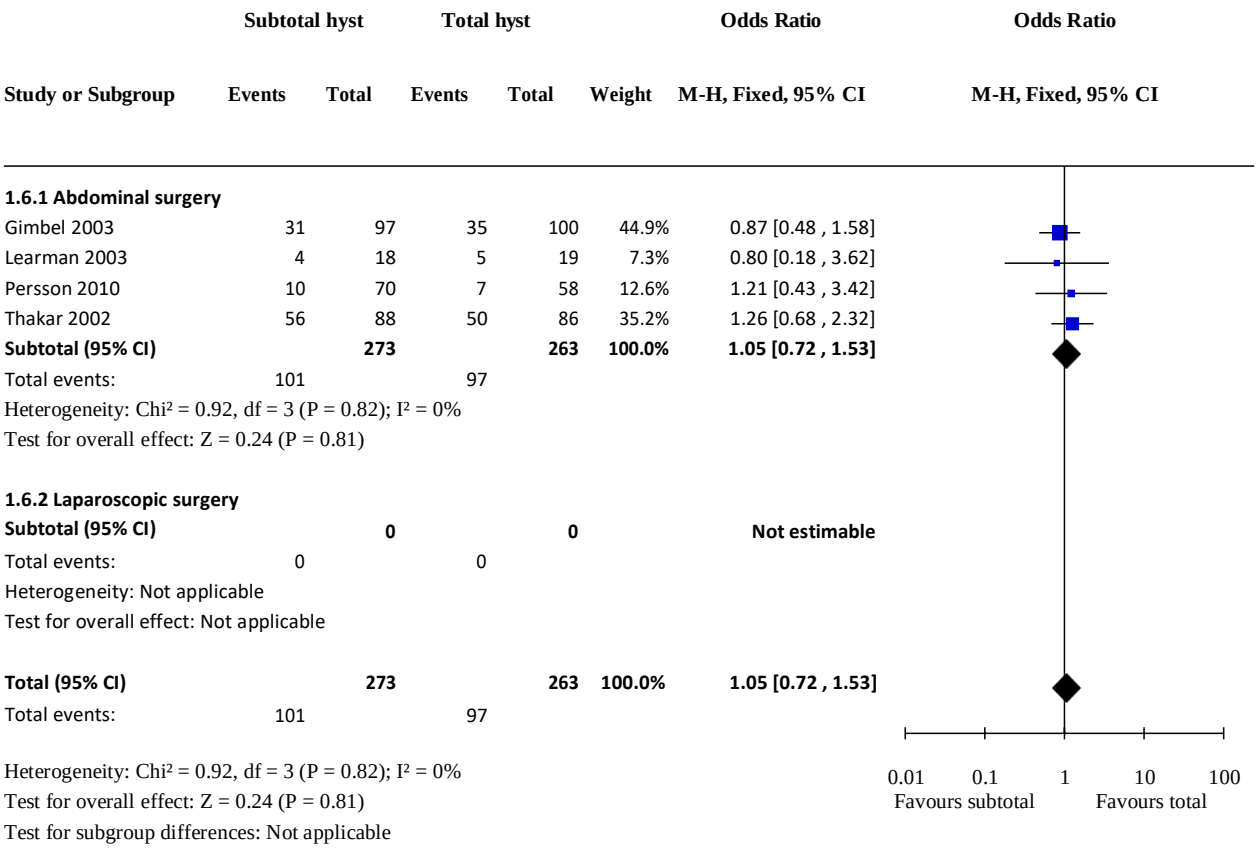


Figure 8. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.6 Prevalence of urinary urgency >2 years post surgery.



Bowel function

There was no evidence of a difference in the rates of constipation (within 2 years: OR 0.80, 95% CI 0.49 to 1.31, 2 studies, 555 women, i^2:73%, low quality evidence - Figure 9; > 2 years: OR 0.97, 95% CI 0.55 to 1.70, 3 studies, i^2:0%, 490 women, moderate quality of evidence - Figure 10) or fecal incontinence (> 2 years: OR 0.63, 95% CI 0.10 to 3.85, 2 studies, 294 women, i^2:0%, moderate quality of evidence -Figure 11). Bowel function outcomes were not measured by the trials where laparoscopic surgery was undertaken. Substantial heterogeneity (I^2 = 73%) was found in the analysis of constipation rates within two years between STH and TH. When data were carefully checked, the values for each outcome were dissimilar at baseline for groups in the Thakar trial. For neither outcome was there evidence of a significant difference between groups with or without the trial with imbalances at baseline. No studies were performed for this outcome using the laparoscopic approach.

Figure 9. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.7 Prevalence of constipation within 2 years post surgery.

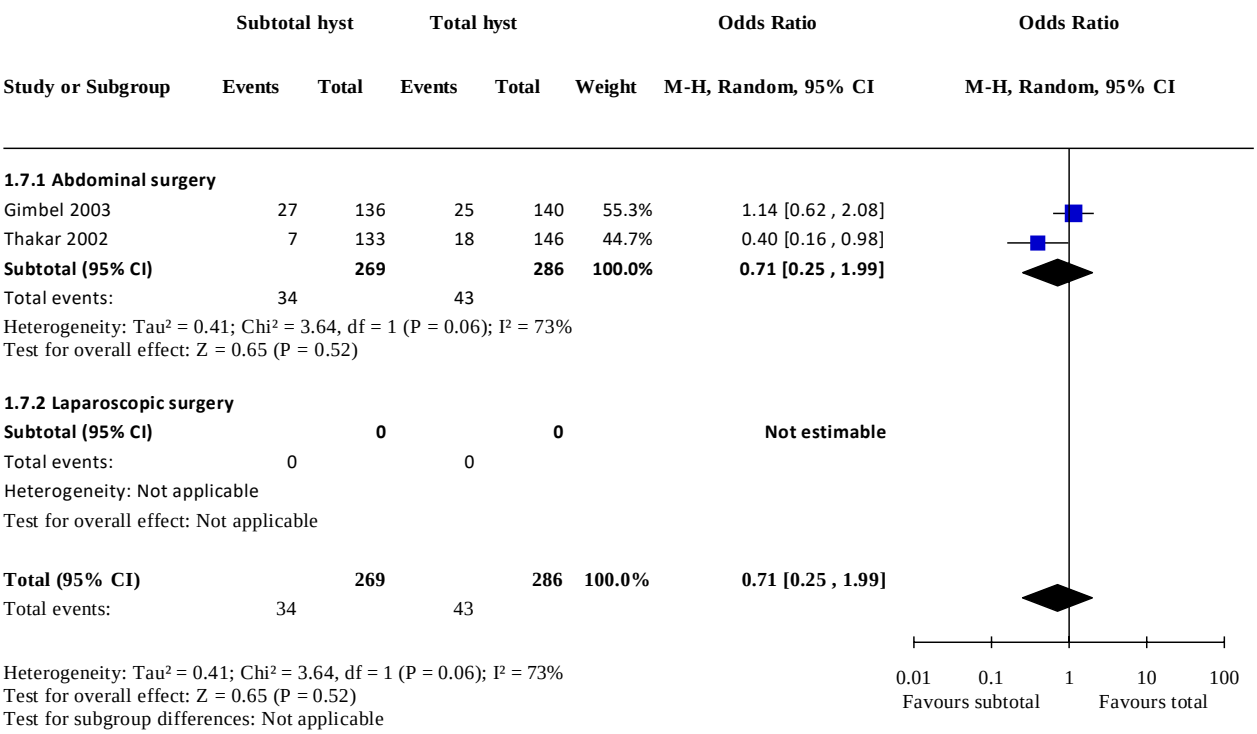


Figure 10. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.8 Prevalence of constipation >2 years post surgery.

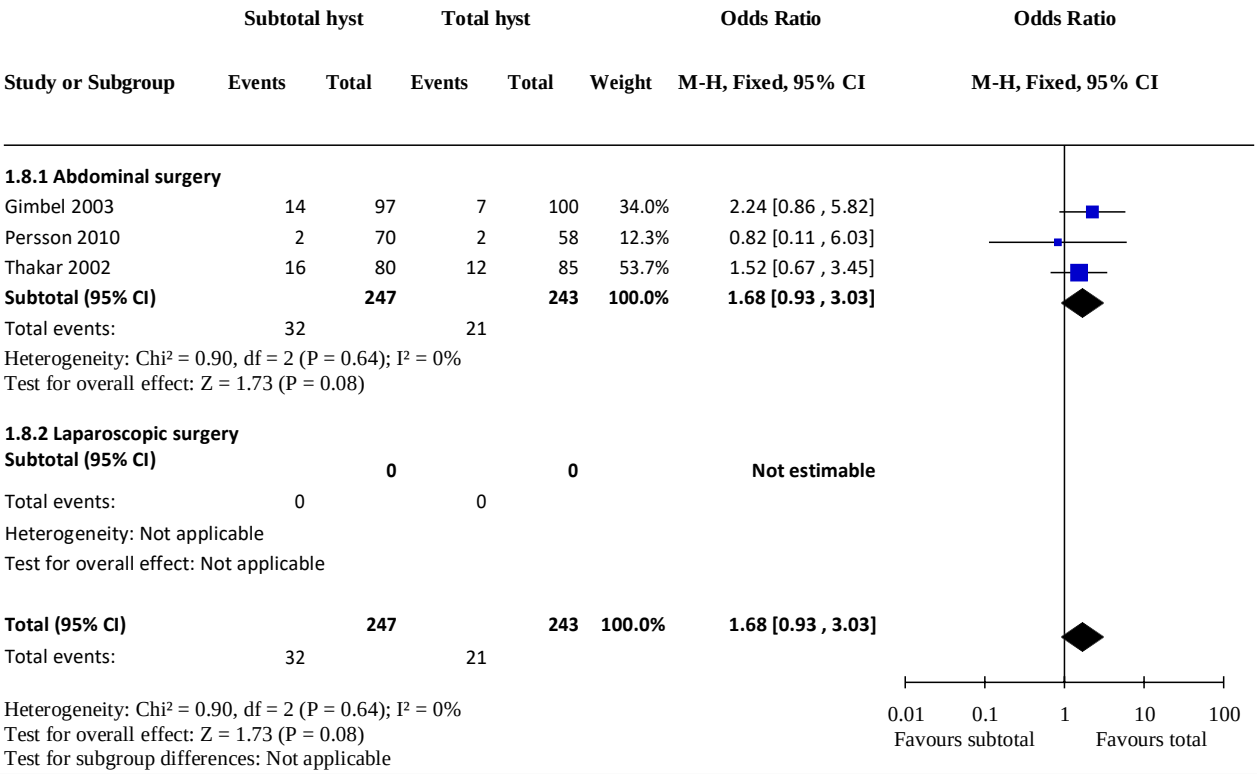
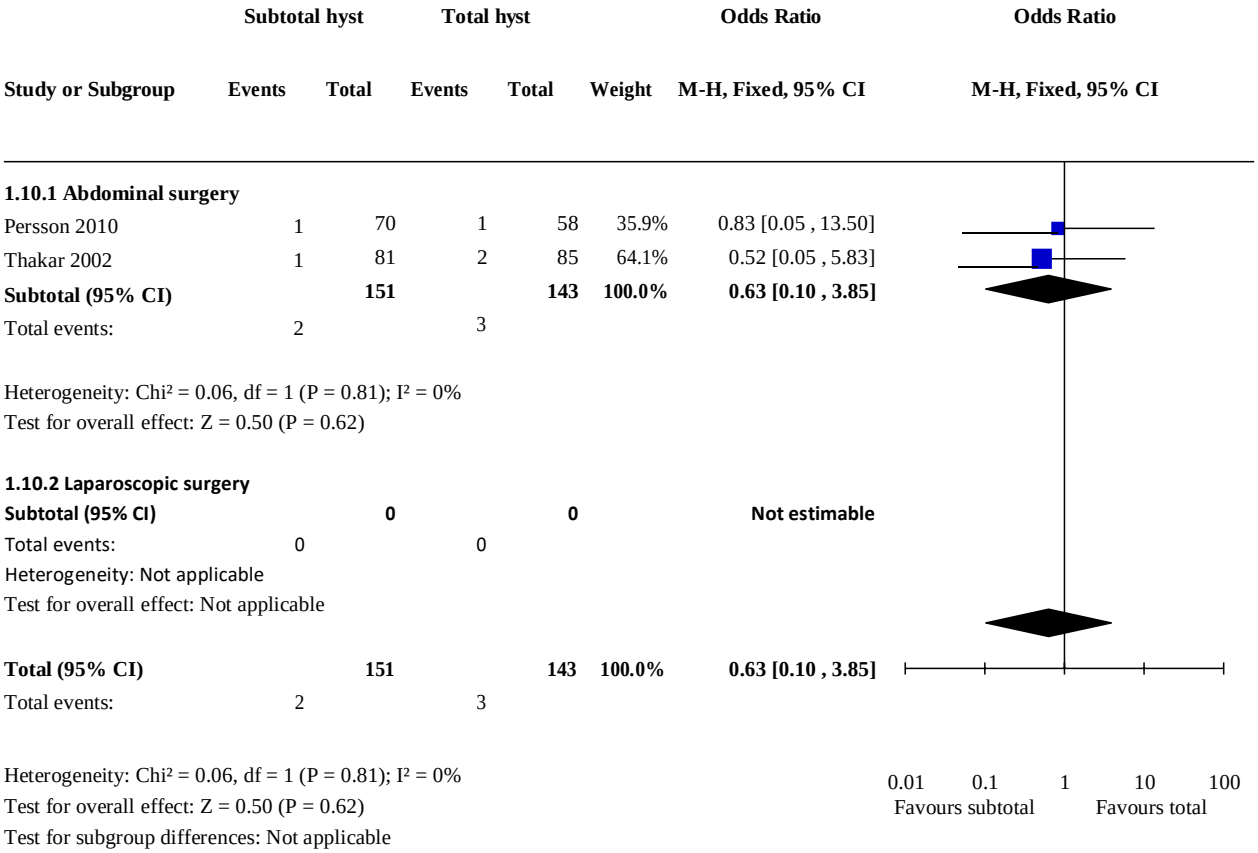


Figure 11. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.10 Prevalence of fecal incontinence >2 years post surgery.



Sexual function

Six trials measured multiple outcomes related to sexual function but the outcomes were measured in different ways, making it inappropriate to pool the results from some studies.

Sexual satisfaction was measured by six studies, using dichotomous or continuous data. There was no evidence of a difference in sexual satisfaction between randomised groups in meta-analyses (within 2 years - dichotomous data: OR 1.06, 95% CI 0.71 to 1.57, 3 studies, moderate quality of evidence - Figure 12; continuous data SMD -0.15, 95% CI -0.43 to 0.13, i^2:52%, 2 studies; Figure 13). One other trial that couldn't be pooled (Ellstrom 2010) also reported no evidence of significant differences. Substantial heterogeneity (I^2 = 76%) was found in the analysis of sexual satisfaction within two years (dichotomous data) between the abdominal subtotal and total hysterectomy. In these two pooled trials, satisfaction was assessed differently; one trial assessed whether women had a good sexual relationship with their partner and the other trial asked women whether they were satisfied with their sexual life, with or without a partner. Neither trial reported a significant difference between groups.

Figure 12. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.11 Satisfaction with sex (dichotomous data) within 2 years post surgery.

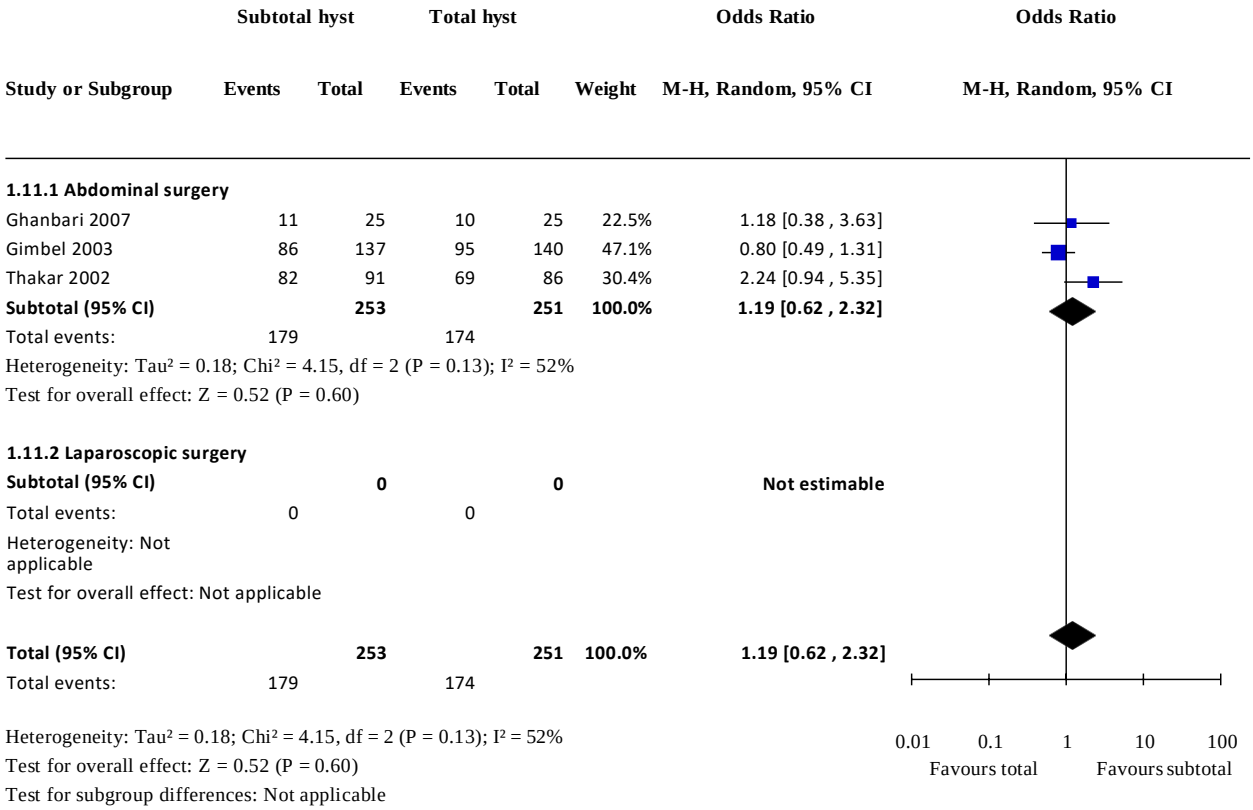
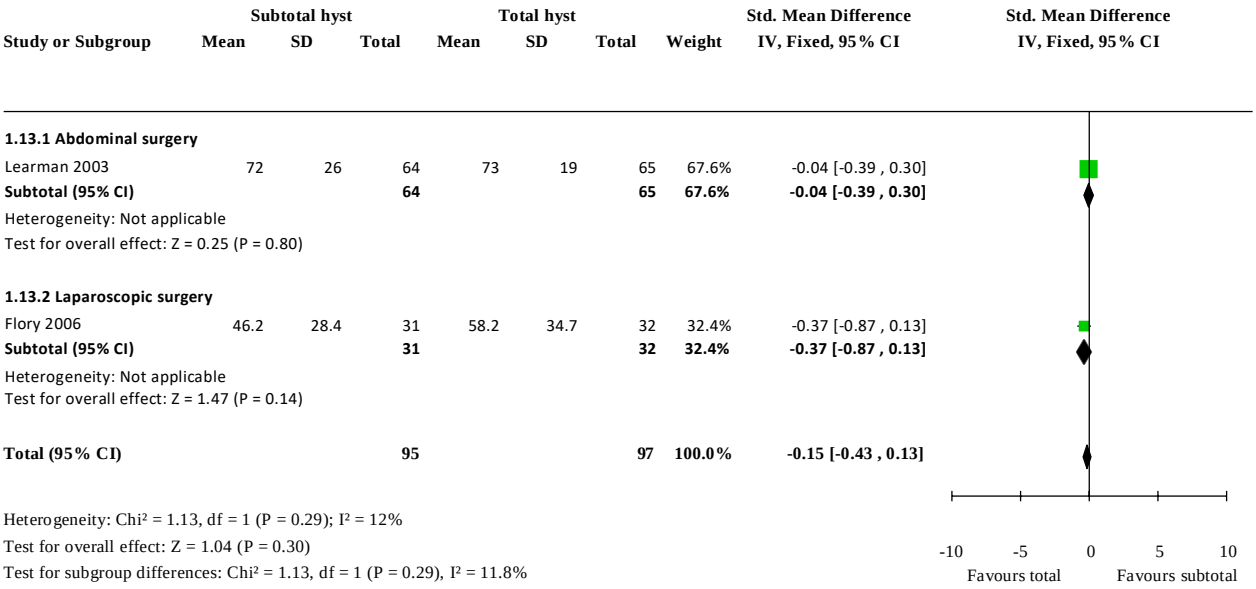
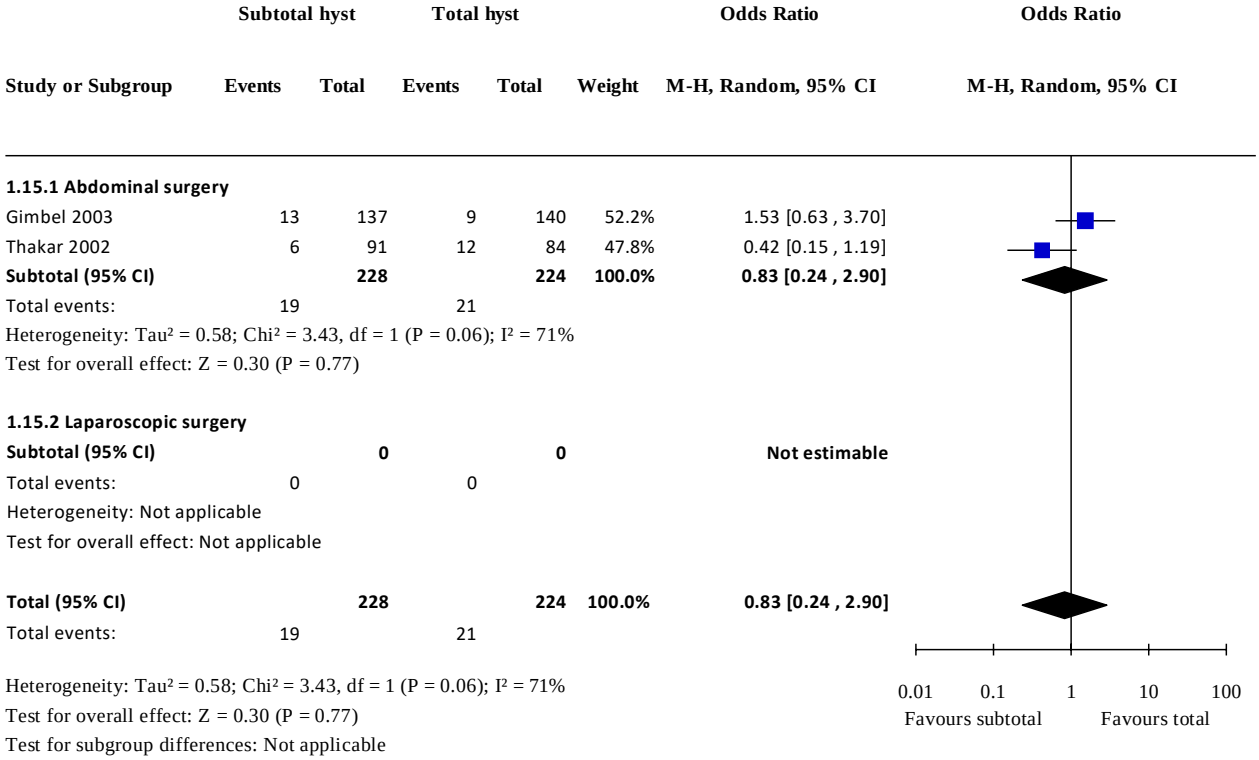


Figure 13. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.13 Satisfaction with sex (continuous data) within 2 years post surgery.



Dyspareunia (pain during intercourse) was measured by four trials. There was no evidence of a difference in dyspareunia (defined as either deep dyspareunia or dyspareunia not otherwise specified) between randomised groups (< 2 years: OR 0.87, 95% CI 0.46 to 1.67, 2 studies, moderate quality of evidence - Figure 14). Substantial heterogeneity (I^2 = 71%) was found in this analysis and the differences were likely to have arisen from different ways of measuring dyspareunia in the two trials. Two studies that couldn't be included in the meta-analyses (Flory 2006; Asnafi 2010) also confirmed that there were no significant differences between groups. One of these studies used a laparoscopic approach to surgery.

Figure 14. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.15 Prevalence of dyspareunia within 2 years post surgery.



Secondary outcomes

Quality of life

Quality of life was measured by five trials where women underwent abdominal surgery and one trial where women had laparoscopy. There was no evidence of a statistically significant difference in any of the quality of life scales measured within two years of surgery, although only a few studies contributed data to each outcome (General health (high better): MD 0.30, 95% CI -0.27 to 0.97, 3 studies; Physical domain (high better): MD -0.52, 95% CI -21.8 to 1.14, 3 studies; Mental domain (high better): MD -0.61, 95% CI -2.05 to 0.82, 4 studies - Figure 15; General health (low better): MD -1.0, 95% CI -4.92 to 2.92; 1 study; Anxiety (low better): MD 0.20, 95% CI -2.68 to 3.08, 1 study; Depression (low better): MD -0.27, 95% CI -1.55 to 1.00, 2 studies; Psychological domain (low better): MD -2.00, 95% CI -15.66 to 11.66, 1 study - Figure 16).

Figure 15. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.17 Quality of life within 2 years post abdominal surgery (high better).

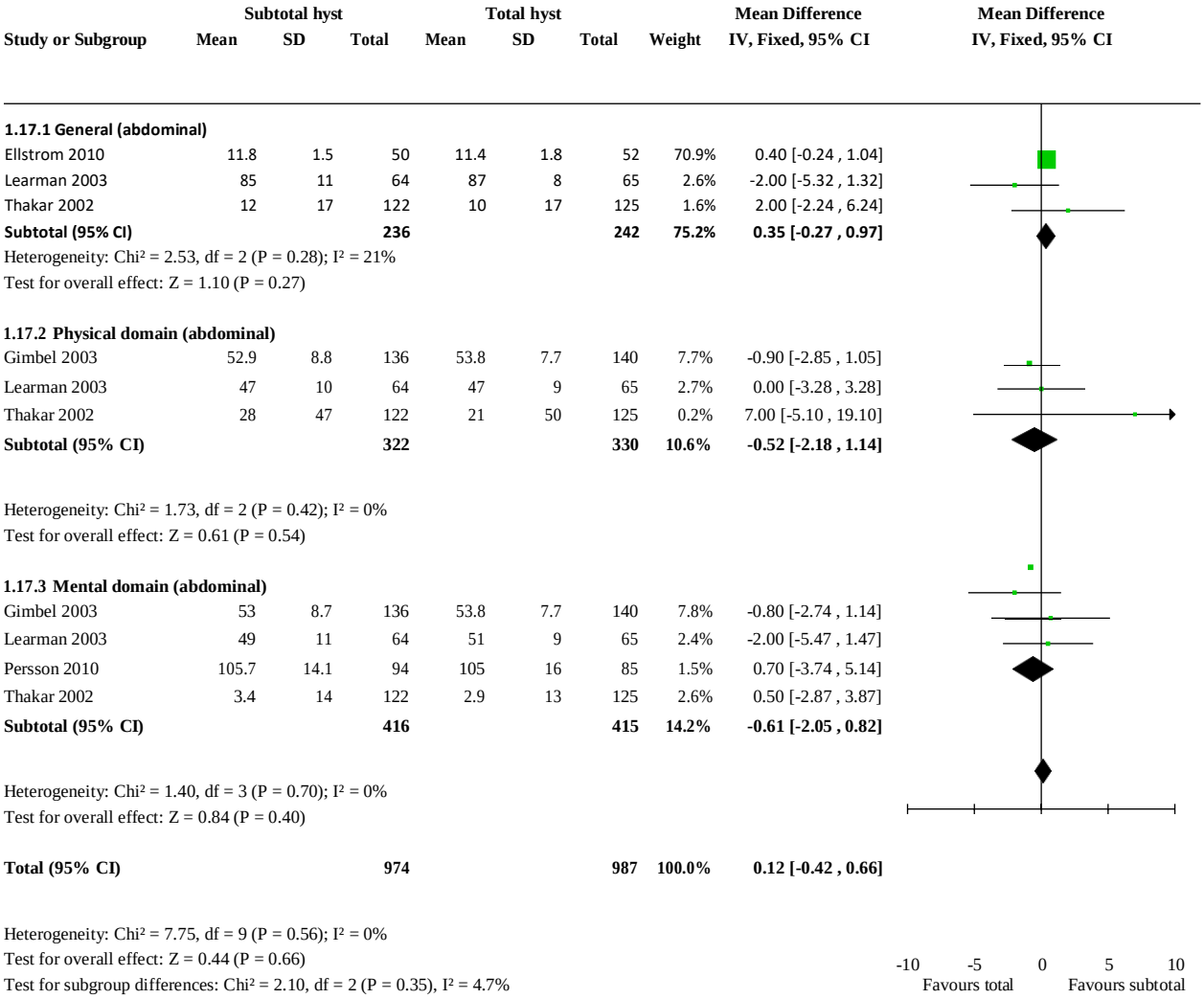
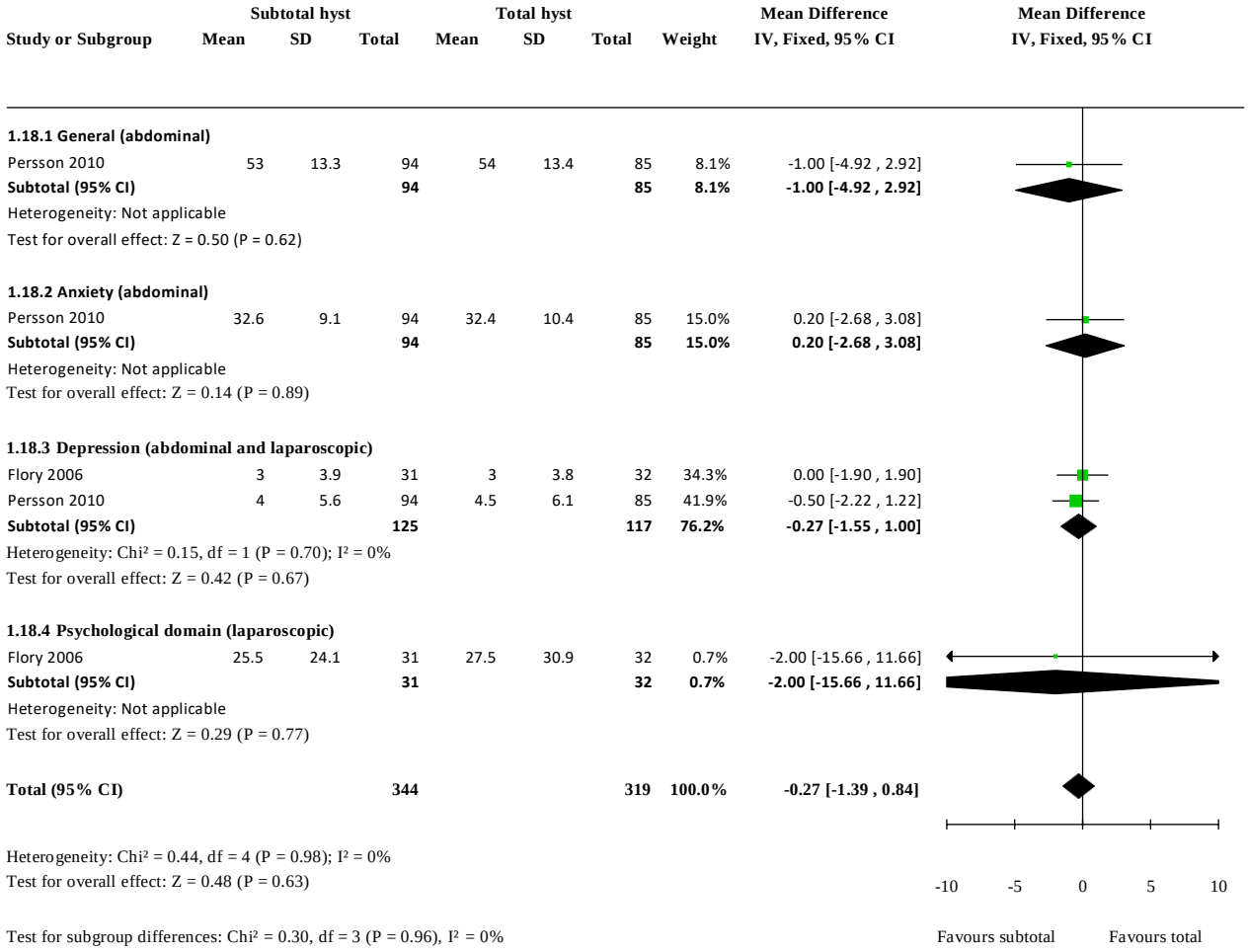


Figure 16. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.18 Quality of life within 2 years post abdominal surgery (low better).



The data from the study that assessed quality of life outcomes at a mean of nine years after surgery were not suitable for pooling; this study also reported no significant differences between groups on any quality of life scales measured (Short Form-36: Physical functioning, Mental Health and General Health and General Health Questionnaire: somatic and anxiety symptoms) (Thakar 2002).

In most of the studies, quality of life improved from baseline (before surgery), regardless of the surgical group.

Operative time, lenght of stay and return to normal activities

Operative time was significantly shorter for STH when compared with TH in general (MD=-13.11 (95%CI -17.56 to -8.66), 991 women, 8 studies, i^2:33% - Figure 17); this difference was perceived in five trials using the open abdominal approach(MD -11.81 mins, 95% CI -15.55 to -8.07) (Thakar 2002; Learman 2003; Gorlero 2008; Persson 2010; Ghanbari 2007), and between the laparoscopic approach (MD -16.61, 95% CI -30.50 to -2.72). There was evidence of statistically significant difference between STH and TH, with a shorter duration for the STH group (MD -0.24, 95% CI -0.44 to -0.04, 5 studies, i^2:12% - Figure 18), althought this might not be clinically or economically significant. No statistically significant difference was seen between the groups with regard to the return to normal activities (MD -0.28, 95% CI -0.64 to 0.08, i^2:47%, 3 studies, 355 women - Figure 19).

Figure 17. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.19 Operating time (mins).

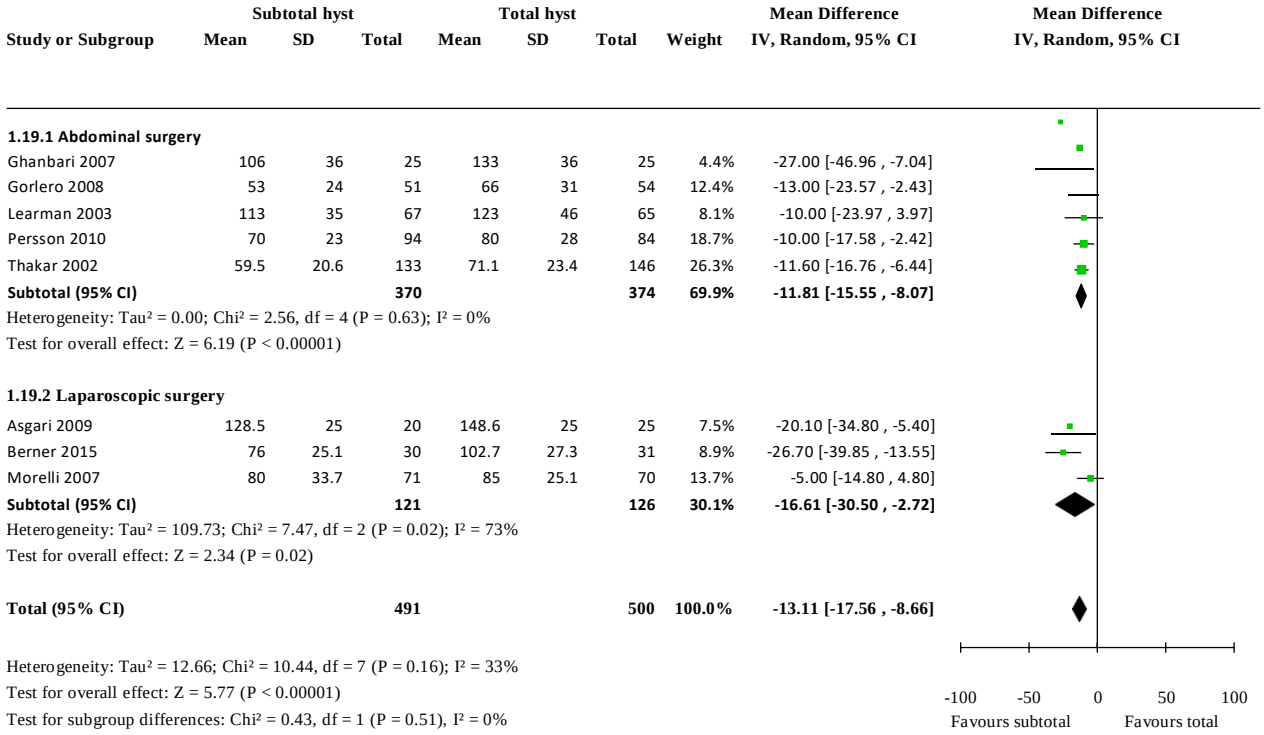


Figure 18. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.20 Length of hospital stay (days).

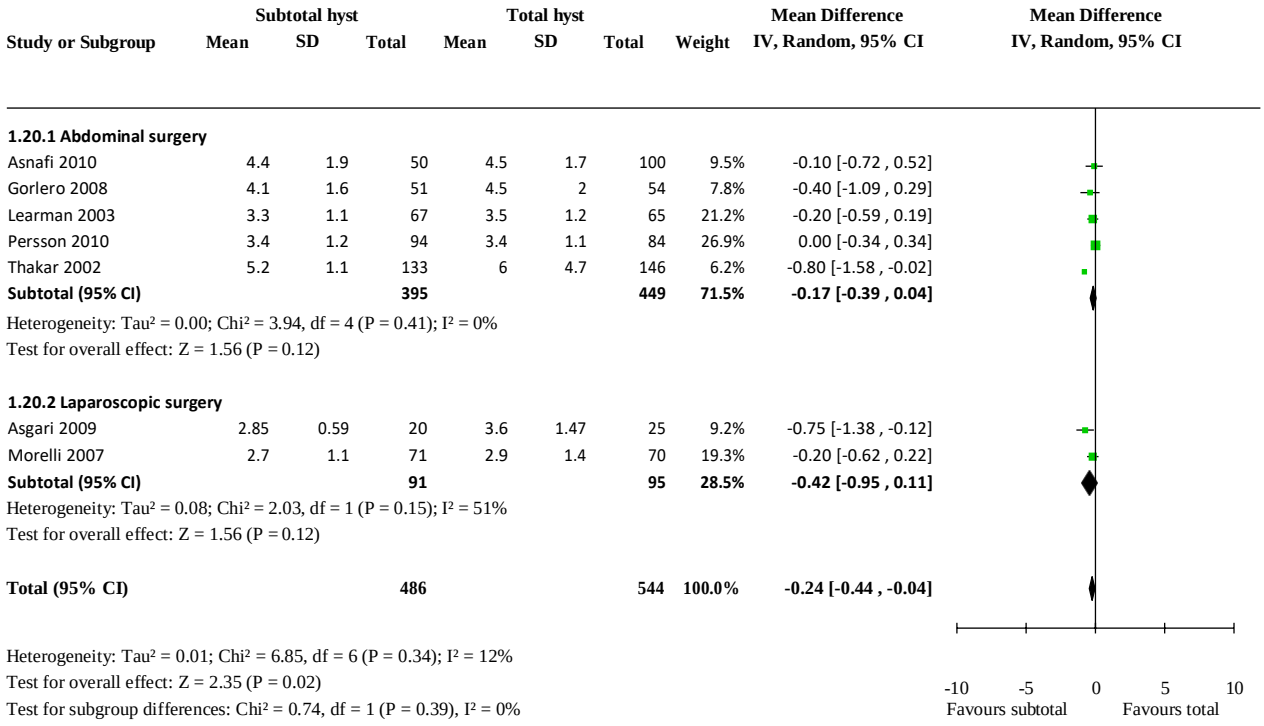
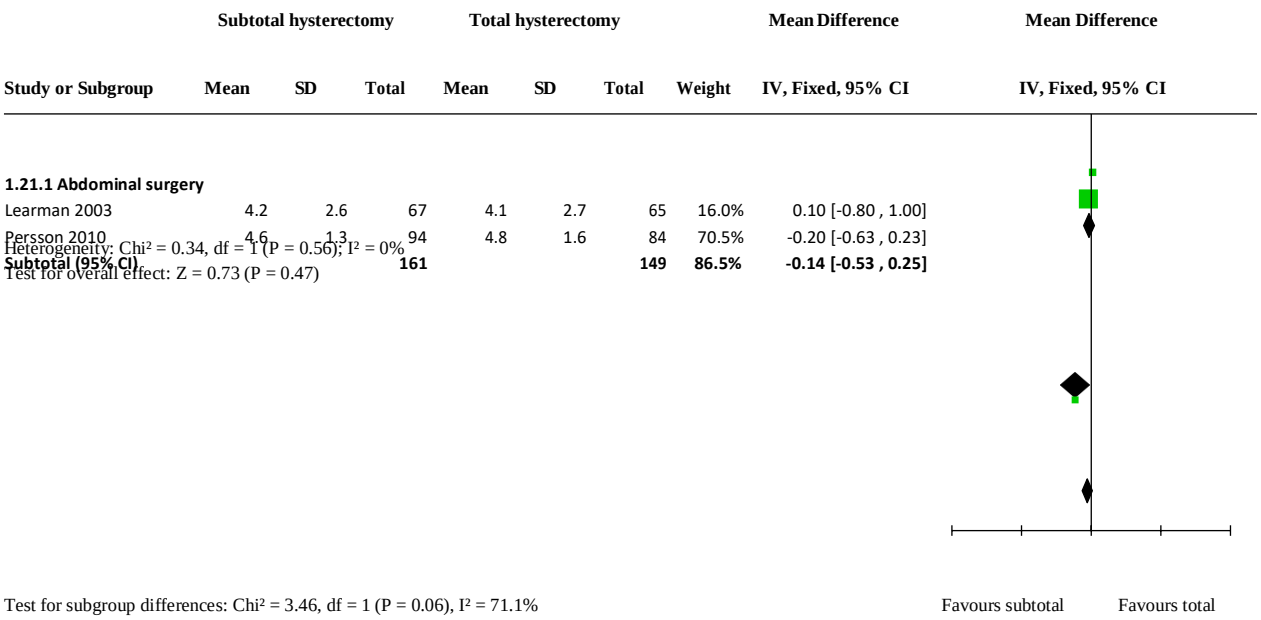


Figure 19. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.21 Return to normal activities (weeks).

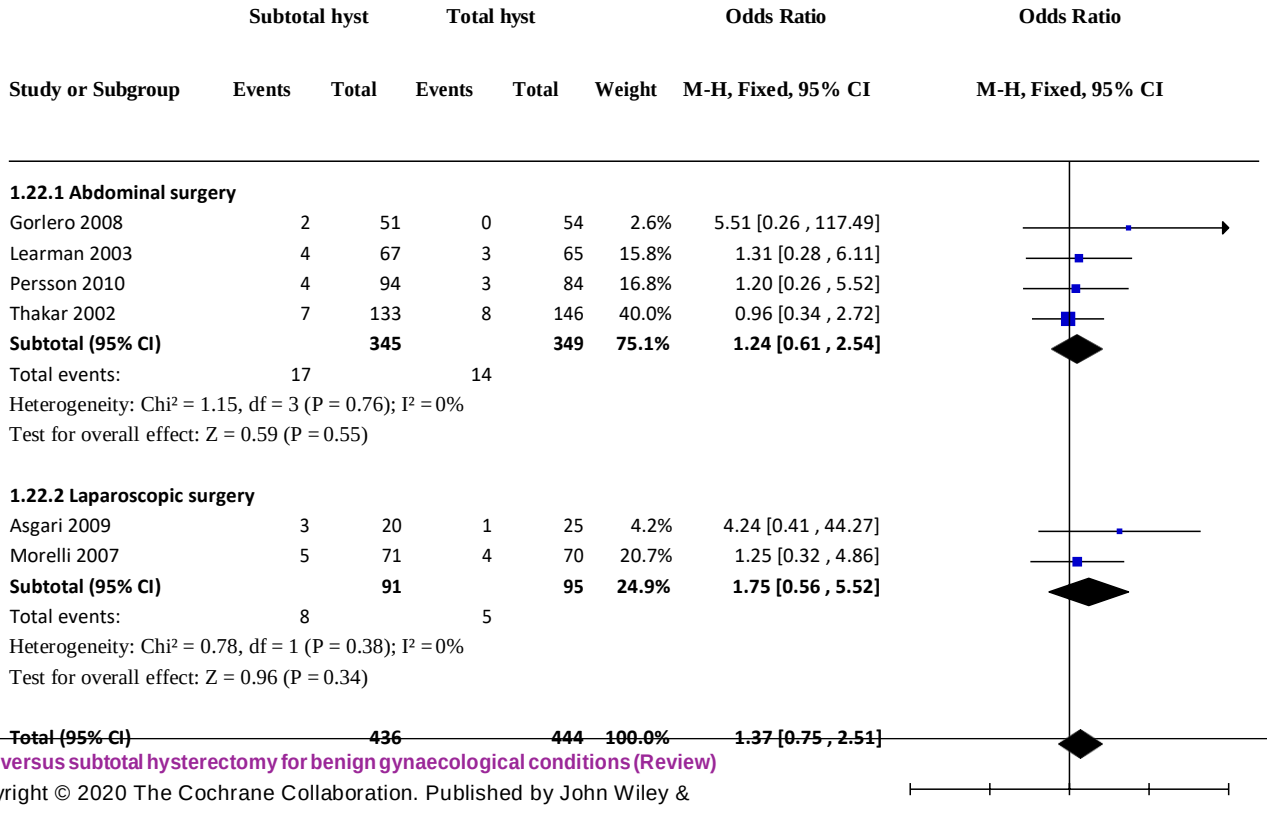


Complications

Short term outcomes

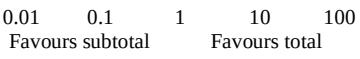
There was no evidence of significant differences between the groups with regard the number of women who required blood transfusions with laparoscopic (OR=1.75 (95% CI 0.56 to 5.52), 2 studies, i^2:0%,186 women), abdominal (OR=1.24 (95%CI 0.61 to 2.54), 4 studies, 694 women, i^2:0%) or both approaches pooled into analysis (OR=1.37 (95%CI 0.75 to 2.51), 6 studies, 880 women, i^2:0% - Figure 20).

Figure 20. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.22 Requirement for blood transfusion.



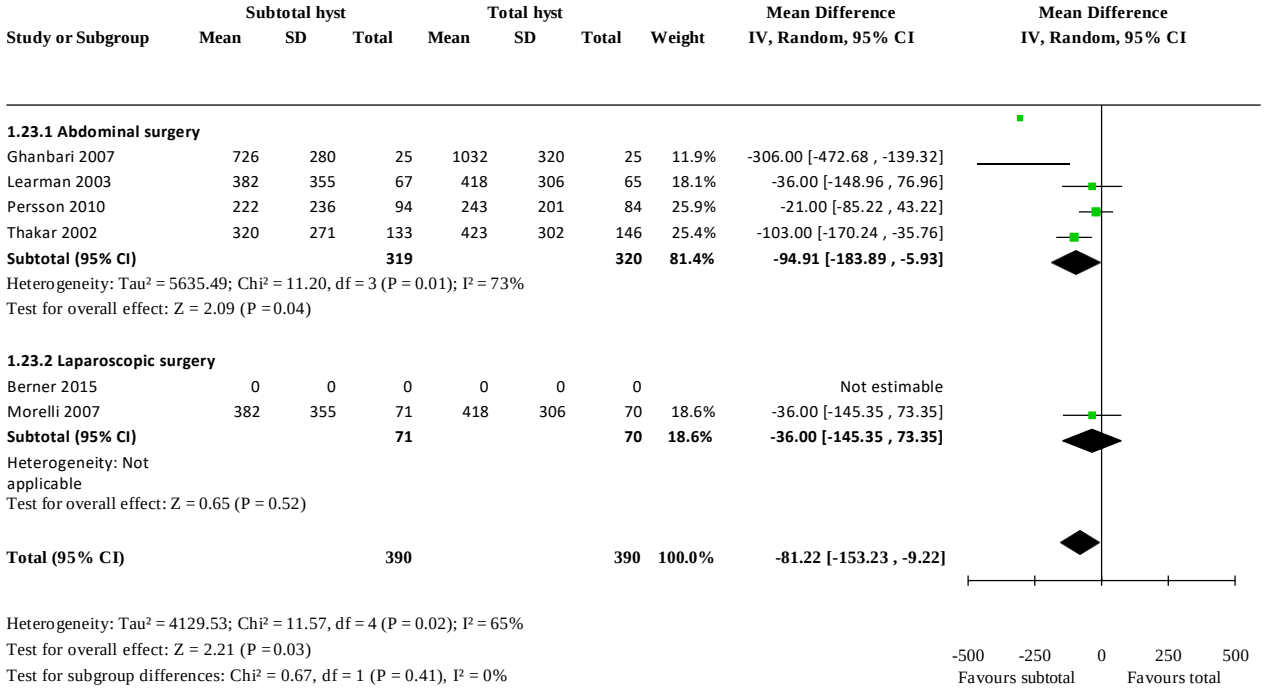
Total events:	25	19

Heterogeneity: Chi² = 2.18, df = 5 (P = 0.82); I² = 0%
Test for overall effect: Z = 1.02 (P = 0.31)
Test for subgroup differences: Chi² = 0.25, df = 1 (P = 0.62), I² = 0%



However, when we analyse estimated blood loss, STH presented less intra-operative blood loss than TH (MD -81.22, 95% CI -153.23 to -9.22, 5 studies, 780 women, i^2:65% -Figure 21); one other trial where the data were not suitable for pooling also found a reduction in blood loss with subtotal hysterectomy (Gimbel 2003). There was no evidence of a significant difference in blood loss between a subtotal and total laparoscopic hysterectomy in one trial.

Figure 21. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.23 Blood loss during surgery (mls).



Pyrexia (OR=0.48, 95%CI 0.31 to 0.75, 5 studies, 933 women, i^2:26%) and urinary retention (OR=23, 95%CI 0.06 to 0.81, 5 studies, 933 women, i^2:0%) were significantly reduced in the STH group when compared to TH. There was no evidence of significant differences in the rates of other short term complications such as surgical injury (OR=1, pelvic haematoma, vaginal bleeding, wound infection, or bowel obstruction between groups (Figure 22).

Figure 22. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.24 Short term complications (predischarge).

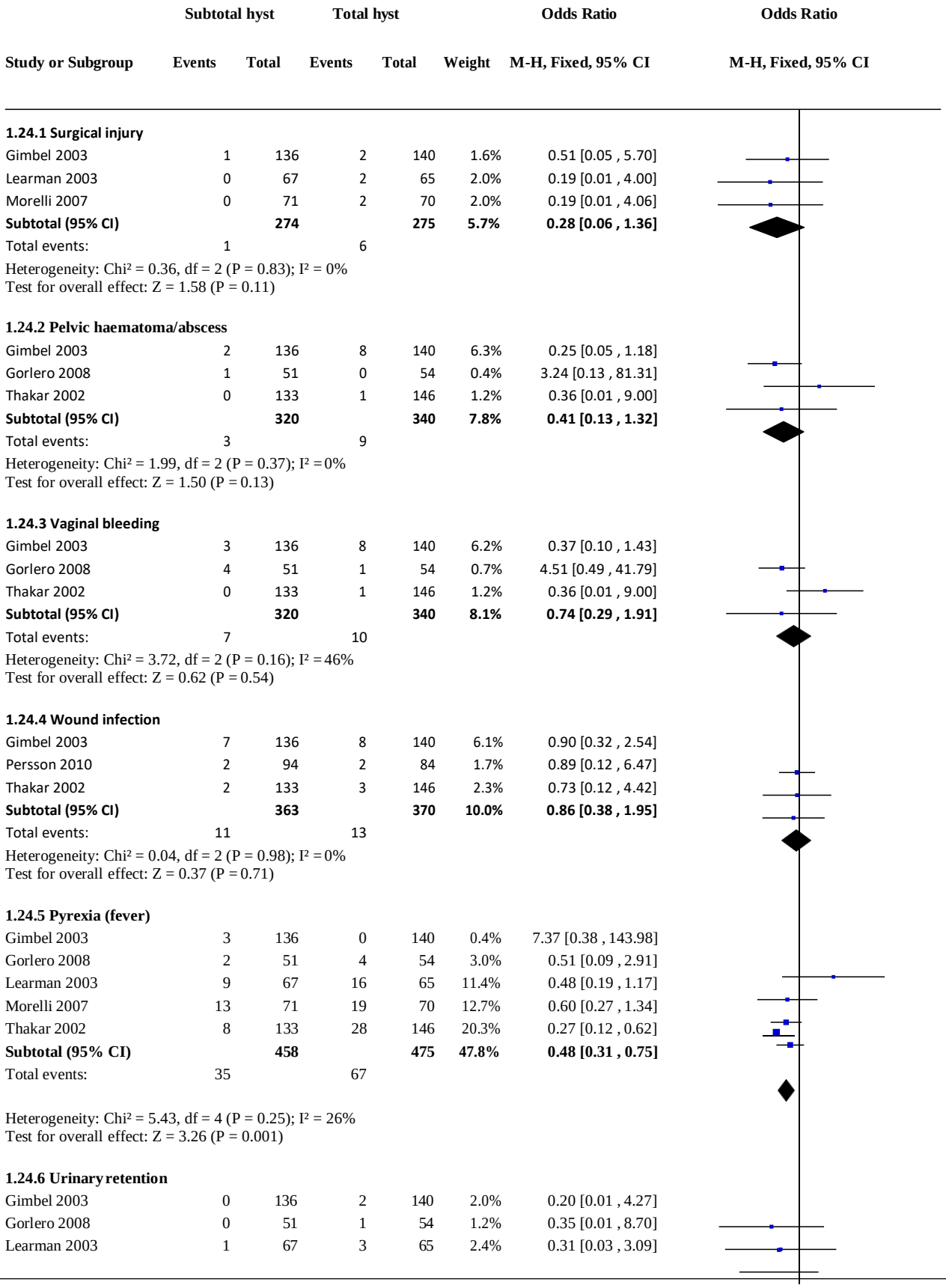
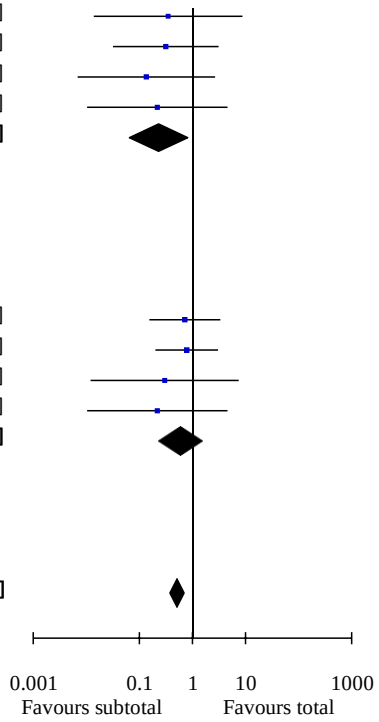


Figure 22. (Continued)

Gorlero 2008	0	51	1	54	1.2%	0.35 [0.01 , 8.70]
Learman 2003	1	67	3	65	2.4%	0.31 [0.03 , 3.09]
Morelli 2007	0	71	3	70	2.8%	0.13 [0.01 , 2.66]
Thakar 2002	0	133	2	146	1.9%	0.22 [0.01 , 4.55]
Subtotal (95% CI)		**458**		**475**	**10.4%**	**0.23 [0.06 , 0.81]**
Total events:	1		11			
Heterogeneity: Chi² = 0.26, df = 4 (P = 0.99); I² = 0%						
Test for overall effect: Z = 2.29 (P = 0.02)						
1.24.7 Bowel obstruction/ileus						
Learman 2003	3	67	4	65	3.1%	0.71 [0.15 , 3.33]
Morelli 2007	4	71	5	70	3.9%	0.78 [0.20 , 3.02]
Persson 2010	0	94	1	85	1.3%	0.30 [0.01 , 7.42]
Thakar 2002	0	133	2	146	1.9%	0.22 [0.01 , 4.55]
Subtotal (95% CI)		**365**		**366**	**10.2%**	**0.59 [0.24 , 1.46]**
Total events:	7		12			
Heterogeneity: Chi² = 0.80, df = 3 (P = 0.85); I² = 0%						
Test for overall effect: Z = 1.14 (P = 0.26)						
Total (95% CI)		**2558**		**2641**	**100.0%**	**0.51 [0.38 , 0.69]**
Total events:	65		128			
Heterogeneity: Chi² = 16.64, df = 25 (P = 0.89); I² = 0%						
Test for overall effect: Z = 4.40 (P < 0.0001)						
Test for subgroup differences: Chi² = 4.53, df = 6 (P = 0.61), I² = 0%						



Intermediate outcomes

Ongoing cyclical bleeding was significantly increased with the subtotal when compared to total hysterectomy (OR 12.18, 95% CI 5.58 to 26.6, 7 studies, i²:34% -Figure 23). There was no evidence of statistically significant differences in the rates of the other intermediate outcomes: persistent pain after discharge, removal of the cervical stump or pelvic organ prolapse. No studies on the incidence of gynaecological cancer after surgery were found.

Figure 23. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.25 Intermediate term complications (after discharge and within 2 years post surgery).

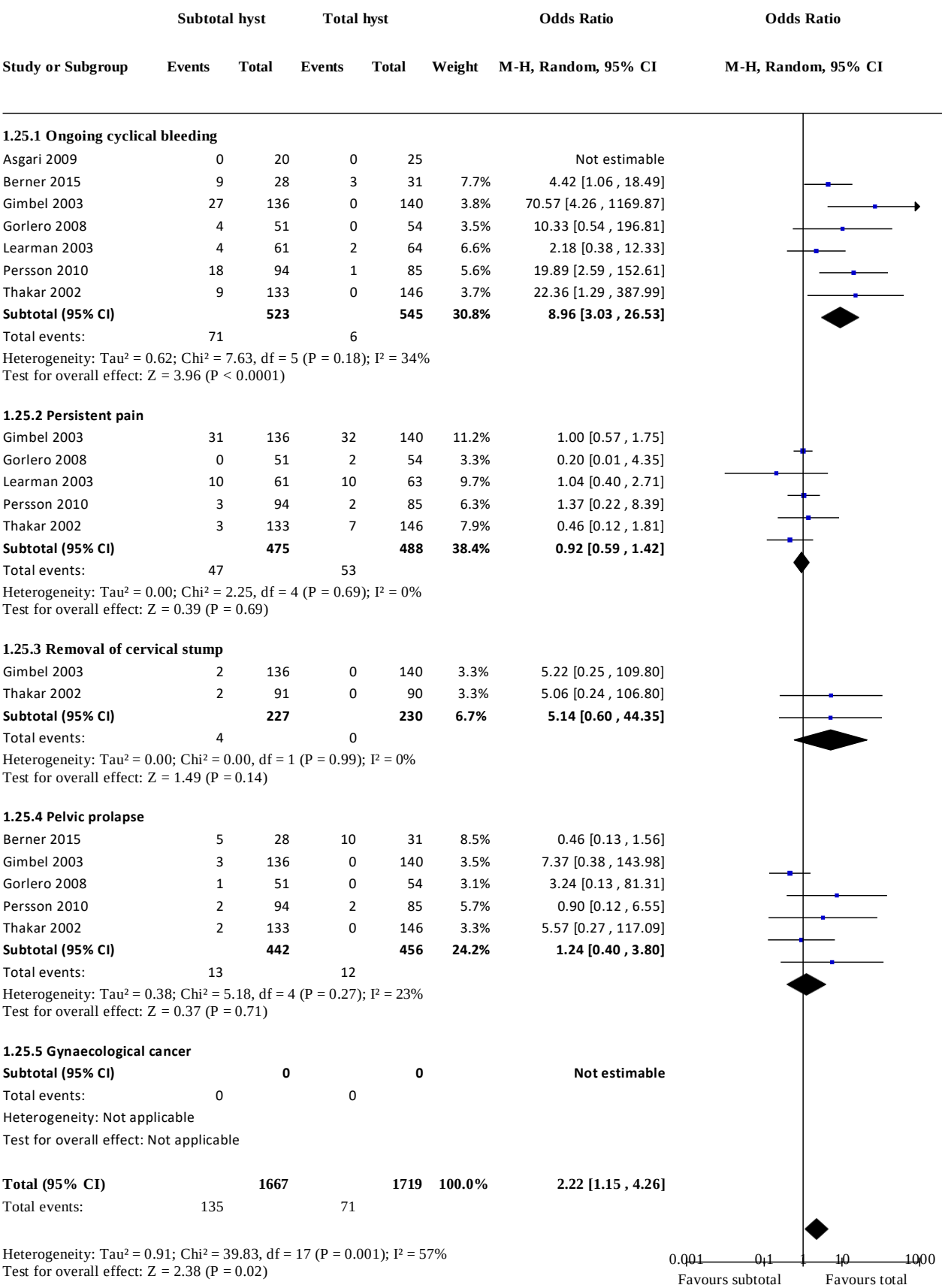
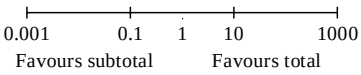


Figure 23. (Continued)

Heterogeneity: Tau² = 0.91; Chi² = 39.83, df = 17 (P = 0.001); I² = 57%
Test for overall effect: Z = 2.38 (P = 0.02)
Test for subgroup differences: Chi² = 16.18, df = 3 (P = 0.001), I² = 81.5%

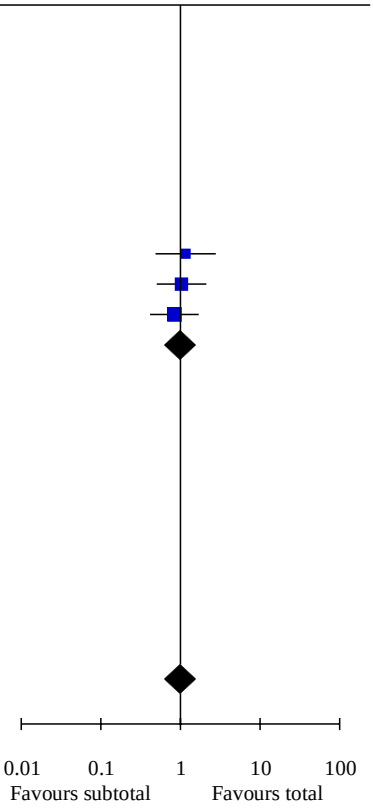


Long term outcomes

At a mean of nine years after surgery, three trials found no significant difference in the rate of pelvic prolapse between the groups (OR=0.98 (95%CI 0.63 to 1.51), 3 studies, 445 women, i²:0% -Figure 24). No studies analyzed the incidence of urogenital fistula after surgery.

Figure 24. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.26 Long term complications (>2 years post surgery).

Study or Subgroup	Subtotal hyst Events	Total	Total hyst Events	Total	Weight	Odds Ratio M-H, Fixed, 95% CI
1.26.1 Fistula						
Subtotal (95% CI)		**0**		**0**		**Not estimable**
Total events:	0		0			
Heterogeneity: Not applicable						
Test for overall effect: Not applicable						
1.26.2 Pelvic prolapse						
Gimbel 2003	12	93	11	97	22.8%	1.16 [0.48 , 2.77]
Persson 2010	27	70	22	58	36.0%	1.03 [0.50 , 2.10]
Thakar 2002	36	65	37	62	41.2%	0.84 [0.41 , 1.70]
Subtotal (95% CI)		**228**		**217**	**100.0%**	**0.98 [0.63 , 1.51]**
Total events:	75		70			
Heterogeneity: Chi² = 0.34, df = 2 (P = 0.84); I² = 0%						
Test for overall effect: Z = 0.09 (P = 0.93)						
1.26.3 Gynaecological cancer						
Subtotal (95% CI)		**0**		**0**		**Not estimable**
Total events:	0		0			
Heterogeneity: Not applicable						
Test for overall effect: Not applicable						
Total (95% CI)		**228**		**217**	**100.0%**	**0.98 [0.63 , 1.51]**
Total events:	75		70			
Heterogeneity: Chi² = 0.34, df = 2 (P = 0.84); I² = 0%						
Test for overall effect: Z = 0.09 (P = 0.93)						
Test for subgroup differences: Not applicable						



The included trials did not have long enough follow up or did not have the goal to compare the odds of gynaecological cancer in the two groups.

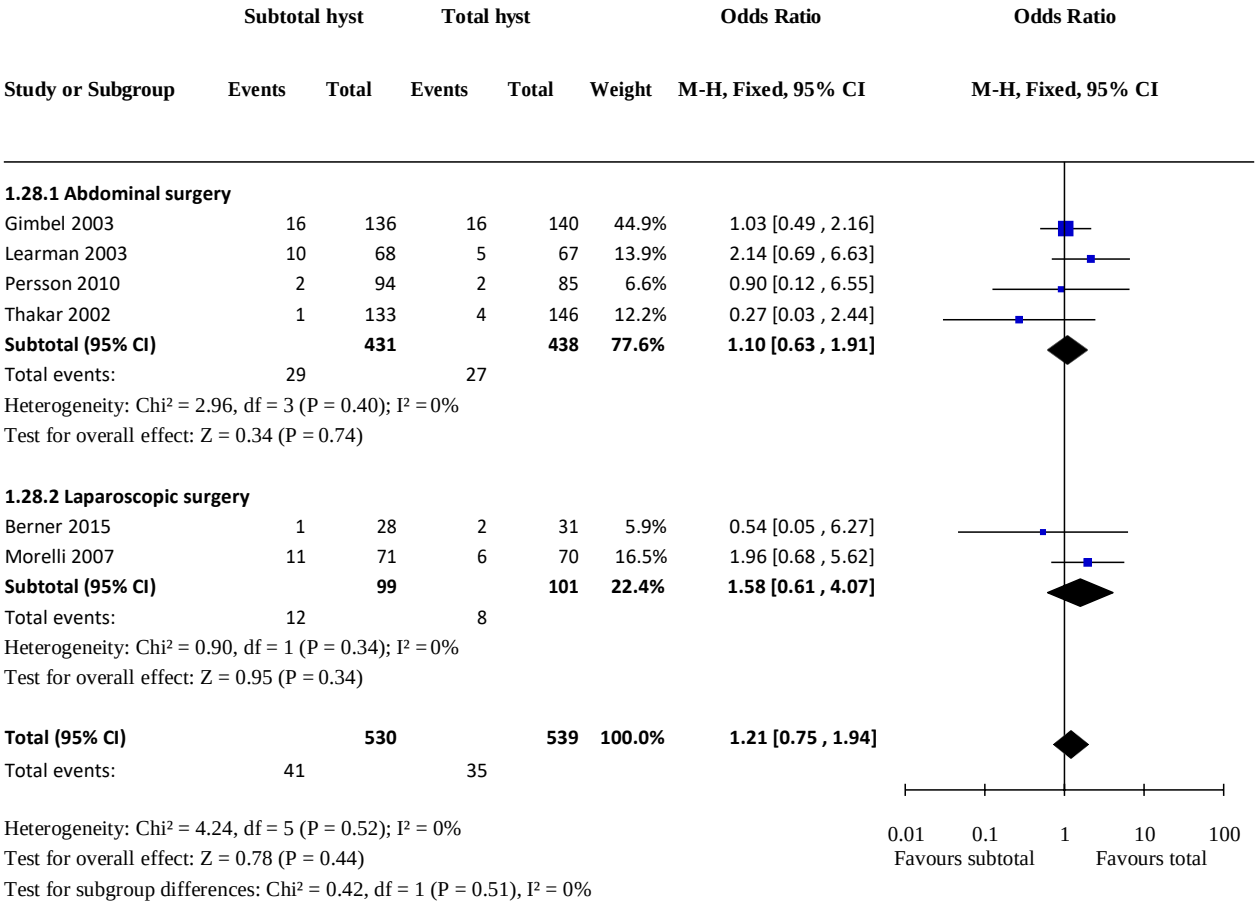
Alleviation of symptoms

There was no evidence of significant differences in the alleviation of pre-surgery symptoms (OR=1.09 995%CI 0.72 to 1.64), i²:0%, 2 studies, 814 women), such as back pain, pelvic pressure, menstrual abnormalities or pelvic pain according to whether a subtotal or total hysterectomy was performed. These outcomes were assessed by one to two trials.

Readmission rate

There was no evidence of a difference in the readmission rate between groups (OR=1.21 (95%CI 0.75 to 1.94), 6 studies, 1069 women, i^2:0% - Figure 25) and subgroup analysis with regard to surgical route presents the same results for the open abdominal (OR=1.10, 95%CI 0.63 to 1.91, 4 studies, 869 women) and laparoscopic (OR=1.58, 95%CI 0.61 to 4.07, 2 studies, 200 women) routes.

Figure 25. Forest plot of comparison: 1 Subtotal hysterectomy versus total hysterectomy, outcome: 1.28 Readmission rate (related to surgery).



Sensitivity analysis

There were too few trials in the analysis to conduct sensitivity analyses.

DISCUSSION

Summary of main results

Primary outcomes

The rationale for undertaking this review was to examine the perception by women and some gynaecologists and health professionals that the retention of the cervix was necessary to maintain sexual pleasure and that total hysterectomy may lead to damage of the pelvic nerves or pelvic support structures that potentially could increase the risk of urinary incontinence, bowel and sexual dysfunction (Thakar 2005). These were therefore considered the primary outcome measures.

This review has not demonstrated an indirect evidence of subtotal hysterectomy causing less damage to neuroanatomical structures than total hysterectomy. The outcomes most indicative of such damage, including urinary, bowel and sexual dysfunction, have shown no consistent evidence of a benefit in women undergoing subtotal hysterectomy after 2 years follow-up. However, the new data from follow-up longer than 2 years have found that subtotal abdominal hysterectomy slightly increases the occurrence of stress urinary incontinence alone. All the other primary outcomes still remain without statistically significant difference between groups. The use of a laparoscopic or abdominal approach to hysterectomy

did not alter the findings in most subanalyses, although some of these analyses were underpowered.

Secondary outcomes

Quality of life measures after surgery did not appear to vary according to type of hysterectomy, whether an abdominal or laparoscopic approach was used, and up to 14 years after surgery was completed. In all studies, quality of life improved significantly from baseline regardless of type of hysterectomy. This benefit of hysterectomy has been reported in another Cochrane systematic review evaluating the effect of hysterectomy for benign disease on women's well being (Lethaby 2009).

A significant benefit of subtotal, as compared to total, abdominal hysterectomy was reduced operating time and reduced blood loss, although no differences were reported in the requirement for blood transfusion. These benefits were not found for the laparoscopic approach possibly because only one trial contributed data. The average difference in operation time of 12 minutes was statistically significant between abdominal and laparoscopic approuaches, favouring the retention of the cervix, but these differences are unlikely to signify a clinically significant benefit. There was no evidence of any difference in recovery from abdominal surgery, either hospital stay or return to normal activities after surgery. One single study suggests that the return to normal activities is shorter after laparoscopic subtotal hysterectomy and two studies shows shorter hospital stay for subtotal laparoscopic hysterectomy .

Overall completeness and applicability of evidence

The findings in this review are based on only ten randomised trials including 1710 women and other studies that provide long term follow-up data from the original trials. A wide range of outcomes relating to urinary, bowel and sexual function have been studied comprehensively in some of the trials included in this review. However, in order to provide a focus to the review and to improve readability, we restricted the potential major outcomes. Nevertheless, inclusion of studies comparing both open and laparoscopic routes, as well as assessing both short term and long term outcomes, have improved the scope for external validity and generalisation of study results.

Quality of the evidence

The studies included in this review are mostly small, and with some methodological flaws. Many of the studies were underpowered to find differences, which is reflected in the wide confidence intervals in the findings. In particular, lack of blinding means we cannot exclude the likelihood that some outcomes may have been influenced by knowledge of the treatment. However, it is almost impossible to guarantee blinding in the comparison of a subtotal with total hysterectomy, because of the need for women with an intact cervix to continue screening for cervical cancer. Moreover, the quality of evidence was moderate in most of the primary outcomes, which suggests that the variables were carefully planned.

Potential biases in the review process

Many of the included studies assessed a multiplicity of outcomes, often correlated, relating to urinary, bowel and sexual function, and measured at a number of different time points without adjustment or correction. The risks of multiplicity of data and clinical heterogeneity among the studies in terms of the types of symptoms, time of reporting of symptoms, scales used to analyse the symptoms and route of surgery have been addressed by stratified analysis and avoiding inclusion of too many outcome measures. In general, a reporting bias could occur when combining outcome measures reported at various time points in the individual studies under a somewhat broad and arbitrary categorisation of less than two years and greater than two years. This is especially relevant for some of the time-related short term outcomes such as urinary symptoms, which potentially could have shown improvement or deterioration over time when measured at intervals like six months, 12 months or 24 months. While combining them all under the less than two years category, we have chosen the time point with the greatest interval since surgery to represent effects persisting after recovery from surgery; and a separate long term analysis more than two years after surgery for some outcomes where longer term information was provided. As mentioned above, this allowed us to reduce the bias due to multiplicity of variables. It will always be recommended to refer to the individual studies for detailed descriptions.

Agreements and disagreements with other studies or reviews

Four retrospective observational studies (Kilkku 1981; Kilkku 1985; Roovers 2001; Neumann 2004) and three systematic reviews (Brown 2000; Gimbel 2007; Robert 2008) have also assessed the effects of type of hysterectomy on various measures of urinary function after surgery. Results were inconsistent in the observational studies and two of the three systematic reviews confirmed most of the results of the RCTs in this review. There was new evidence of a difference in stress incontinence according to type of hysterectomy after 2 years follow up. Interpretation of this new finding must consider the fact that the majority of the long term follow ups were based on letter response rather than clinical evaluation. The Brown systematic review did suggest that, for women aged more than 60 years, urinary incontinence after hysterectomy is about 60% higher than for women in the same age group who had not undergone hysterectomy. This has not been confirmed by other studies, before the RCTs in this review which measured incontinence at baseline and post- surgery. It is possible that the conditions that may lead to hysterectomy adversely affect lower urinary tract function and surgery provides a benefit. The outcomes measured here were measures of women's perception of urinary symptoms rather than urodynamic investigation since the association between clinical symptoms and urodynamic findings is poor (Abrams 1983). The Robert systematic review suggested that although there was no evidence of statistical differences, their meta-analysis showed a non-significant trend toward increased risk of stress incontinence (RR 1.3, 95% CI 0.94, 1.78) and incomplete emptying (RR 0.9, 95% CI 0.59 to 1.38) in women who underwent a subtotal compared with total hysterectomy. They suggested that the included trials may have been underpowered to detect effects and that longer follow up was needed to allow symptoms to emerge. However, this present review has included additional data with much longer follow up (average of nine years), published since the Robert meta analysis, which indicates similar rates of stress incontinence and incomplete emptying regardless of whether subtotal or total hysterectomy was performed. The systematic review by Gimbel concluded that overall incontinence was less likely for women undergoing total hysterectomy. However, the Gimbel review included a trial which was excluded by this review and groups were not comparable at baseline; in this trial, 64% of those undergoing subtotal hysterectomy had stress incontinence prior to surgery compared to only 18% of women in the total hysterectomy group. Moreover, Gimbel assessed prevalence of total incontinence by pooling different types of incontinence, stress, urge and mixed. This approach is not appropriate as stress and urge incontinence are considered to develop from different causes.

Few studies have assessed bowel function according to type of hysterectomy surgery. One retrospective study not included in the review has reported an increased prevalence of disturbed bowel function within one month of hysterectomy that waned over time but no differences according to type of surgery (van Dam 1997). In a prospective multicentre study (Roovers 2007), defecation complaints such as constipation and incomplete evacuation were more prevalent in women undergoing subtotal hysterectomy when compared to women undergoing total hysterectomy.

Sexual response after hysterectomy has been extensively studied in a number of observational studies but results were inconsistent and some of the studies had methodological flaws (Kilkku 1983; Kilkku 1983a; Saini 2002; Roovers 2003; Roussis 2004; Lonnee-HoNmann 2006). The poorer quality retrospective studies (Kilkku 1983; Kilkku 1983a; Saini 2002) reported that women undergoing subtotal hysterectomy reported better sexual function and satisfaction than those undergoing total hysterectomy, but two more recent better quality prospective studies and one retrospective study (Roovers 2003; Roussis 2004; Lonnee-HoNmann 2006) reported no differences between groups. These latter three

studies also reported that perceived sexual function appeared to improve after hysterectomy regardless of technique.

AUTHORS' CONCLUSIONS

Implications for practice

There appears to be a limited resurgence in rates of subtotal hysterectomy in the Western world. This review, however, has not confirmed the perception that subtotal hysterectomy offers improved outcomes for urinary, sexual and bowel function when compared with total hysterectomy. Although surgery is significantly faster and blood loss reduced, these may not translate to clinical benefits. Post-operative febrile morbidity is reduced with subtotal hysterectomy but ongoing cyclical vaginal bleeding is likely to be increased up to a year after surgery. A consensus opinion published by the American College of Obstetricians and Gynecologists concluded that subtotal hysterectomy should not be recommended by the surgeon as superior to total hysterectomy when indicated for benign disease (ACOG 2007 (reaffirmed 2010)). Women requiring hysterectomy need to be given information based on the evidence presented in this review so that they can make well informed choices, and this is not often routine. An American survey reported that fewer than 20% of gynaecologists offered women a choice between subtotal and total hysterectomy (Zekam 2003). Women can be informed about the route of hysterectomy by reference to another Cochrane systematic review (Nieboer 2006).

One of the rationales for total, as opposed to subtotal, hysterectomy is the potential risk of cervical cancer when the cervix is left in place, although this review has not been able to assess this risk. The incidence of cervical cancer in women who have had subtotal hysterectomy is rare; a study of 1104 women having this surgery in Denmark between 1978 and 1988 found an incidence of 0.3% (Storm 1992). The same study, however, reported a 3.3 to 5 fold increased rate of cervical cancer if subtotal hysterectomy was carried out in women aged 50 years or older. Another study of cervical cancer screening in the Midwestern United States showed no differences in screening rates between women who did not have hysterectomy (Eaker 1998). This potential risk is not such an issue for women in countries that have routine cervical screening programs. However, it may be prudent to advise against subtotal hysterectomy in women with a history of high grade cervical lesions, a fear of developing cervical cancer, or cervical cancer screening that is not up to date or unlikely to occur regularly in the future. Even in countries where routine cervical screening exists, it is important that women are adequately counselled prior to and after subtotal hysterectomy.

Implications for research

Although this review has not confirmed the presumed superiority of subtotal hysterectomy for preserving urinary, sexual and bowel function, the conclusions are based on only nine RCTs, only one of which was blinded; with approximately 1500 women in total. There are difficulties in adequately measuring these complex outcomes and more research would be welcome to confirm the provisional conclusions of this review. Larger, double blinded randomised controlled trials with adequate assessment tools are needed because many of the important outcomes are subjective. One of the expected disadvantages of total hysterectomy, an increase in post-operative vaginal vault prolapse, has not been confirmed in this review and it is possible that the trials were underpowered to adequately assess this outcome. Prolapse may appear years after hysterectomy and more studies with long term follow up are needed to assess whether cervical preservation results in better support of the vaginal vault.

Four of the six studies in this review compared subtotal abdominal with total abdominal hysterectomy. The short term advantages of the laparoscopic approach have been well documented and it has been argued that these benefits may be even more apparent with subtotal laparoscopic hysterectomy. Thus, the comparative benefits of laparoscopic total and subtotal hysterectomy need to be tested in more blinded well designed RCTs.

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* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Asgari 2009

Study characteristics

Methods	RCT
Participants	Patients who were candidates for hysterectomy with benign disease with no contraindications for laparoscopic surgery; recruited from Arash Hospital from March 2007 to April 2009. N=45; 20 for subtotal and 25 for total hysterectomy
Interventions	(1) subtotal laparoscopic hysterectomy; (2) total laparoscopic hysterectomy
Outcomes	Duration of surgery, blood transfusion, length of hospital stay, post-operative pain, time to return to normal activities, sexual function, dyspareunia, cyclic bleeding, cervical prolapse, intra and post-operative complications

Asgari 2009 *(Continued)*

Notes

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding (performance bias and detection bias) All outcomes	High risk	No blinding
Incomplete outcome data (attrition bias) All outcomes	Low risk	No reported dropouts
Selective reporting (reporting bias)	Low risk	All prespecified outcomes reported
Other bias	Unclear risk	Possible translation bias

Asnafi 2010

Study characteristics

Methods	Randomisation method: Not reported No. of centres: 1 Design: Parallel group Blinding: Not reported but unlikely No. randomised: 150 No. analysed: 150 Power calculation: Yes (150 overall to detect a 20% difference between the groups with 80% power, alpha level of 0.95 and confidence level of 95%) Intention-to-treat analysis: Yes, except for sexual functioning/dyspareunia - analyses performed only in women who were sexually active or complained of dyspareunia Source of funding: Babol Medical University, Iran
Participants	Inclusion: Women >35 years; premenopausal; offered abdominal hysterectomy for symptomatic uterine fibroids with confirmation of the lesion or abnormal uterine bleeding without any response to hormone therapy of at least 3 months trial. Exclusion:

Asnafi 2010 *(Continued)*

	Age >50 years at screening; positive pregnancy test; genital tract carcinoma; body weight >100kg; diabetes mellitus; candidates for vaginal hysterectomy determined by a gynecologist; unlikely to remain geographically accessible for follow up. Age: 43 and 46 years (mean in each treatment group) Source: From Department of Gynecology in a teaching hospital associated with Babol Medical University in Iran
Interventions	(1) subtotal abdominal hysterectomy (2) total abdominal hysterectomy Follow up: 6 months after surgery
Outcomes	Fever; anaemia; duration of hospitalisation, changes in sexual function
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Stated as "randomly assigned"
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding (performance bias and detection bias) All outcomes	High risk	Lack of blinding could have affected outcomes such as sexual functioning and pain
Incomplete outcome data (attrition bias) All outcomes	Low risk	No reported dropouts
Selective reporting (reporting bias)	Low risk	All prespecified outcomes reported
Other bias	Unclear risk	Sexual functioning assessed only in subgroups of women - unclear if these subgroups groups were comparable at baseline. Short follow up for assessment of sexual functioning

Berner 2015

Study characteristics

Methods	Randomisation method: Allocation from sealed opaque envelopes No. of centres: 1 Design: Parallel group

Blinding: Participants blinded throughout the follow-up

No. randomised: 62

No. analysed: 59

Berner 2015 *(Continued)*

	Power calculation: Yes (62 participants with test power of 90% and level of significance of 0,05) Intention-to-treat analysis: Yes Source of funding: The Department of Gynaecology, Oslo University Hospital
Participants	Inclusion: Women; premenopausal; requiring a hysterectomy for a benign indication; occurrence of cyclical pelvic pain; Exclusion: Menopausal women; unable to communicate in Norwegian, previous history of CIN, cellular changes suggestive of CIN or malignancy; atypical hyperplasia or malignancy; substantially enlarged uterus; pelvic organ prolapse (POP) more than grade 1, women with a concomitant condition requiring removal of both ovaries; non-cyclic chronic pelvic pain; severe or deep infiltrating endometriosis. Age: 45.1 and 44.5 years (mean in each treatment group) Source: From Department of Gynecology, Oslo University Hospital
Interventions	(1) total laparoscopic hysterectomy (TLH) (2) Laparoscopic supracervical hysterectomy (LSH) Follow up: 12 months after surgery
Outcomes	Reduction of cyclic pelvic pain; amount and type of bleeding, occurrence and grade of POP, patient satsfaction, quality of life
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Randomisation plan generator
Allocation concealment (selection bias)	Low risk	Numbered opaque sealed envelopes opened after patient under general narcosis
Blinding (performance bias and detection bias) All outcomes	Low risk	Single blinded. Patient didn't know
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	Not informed
Selective reporting (reporting bias)	Low risk	All prespecified outcomes reported
Other bias	Unclear risk	Not informed

Ellstrom 2010

Study characteristics

Methods	Randomisation method: Method not described, other than allocation from sealed opaque envelopes No. of centres: 1 Design: Parallel group Blinding: No No. randomised: 132 No. analysed: 104 Exclusions from analysis: Subtotal: declined surgery or operated elsewhere (n=2); salphingoophorectomy (n=2); lost to follow up (n=10) Total: declined surgery or operated elsewhere (n=5); malignancy diagnosed perioperatively (n=1); lost to follow up (n=10) Protocol violations: Subtotal: Change of method due to surgical complications (n=2) Total: n=0 Power calculation: Yes (50-70 patients per treatment arm required, no other details reported) Intention to treat analysis: Stated as yes, but not true ITT analysis as lost to follow up not included Source of funding: Swedish Medical Research Council (B95-17X-11237-01A) and the Goteborg Medical Society Fund
Participants	Inclusion: Pre-menopausal patients scheduled for hysterectomy for benign disorders Exclusion: Previous cervical dysplasia; planned oophorectomy; previous symptomatic prolapse Age: 45 years (mean) Source: Patients requiring hysterectomy for benign disorders at the Department of Obstetrics and Gynaecology, Sahlgrenska University Hospital, Gothenburg, Sweden
Interventions	(1) subtotal hysterectomy (2) total hysterectomy For both treatment groups, abdominal hysterectomy was recommended when the diameter of the uterus was >11cm, otherwise vaginal or laparoscopic surgery was planned but the final decision was made by the surgeon. Follow up: 12 months after surgery
Outcomes	Changes in sexual health (measured by the McCoy Female Sexuality Questionnaire) and changes in psychological wellbeing (measured by the Psychological General Well-being index)
Notes	Lack of power

Ellstrom 2010 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	"Randomised in a ratio of 1:1" but method not described
Allocation concealment (selection bias)	Low risk	Sealed opaque envelopes; performed by a study nurse
Blinding (performance bias and detection bias) All outcomes	High risk	Blinding of participants was originally planned but proved impossible. Knowledge of treatment could have affected patients' perceptions of sexual function and health
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	>20% attrition in each group
Selective reporting (reporting bias)	Low risk	All prespecified outcomes reported
Other bias	Unclear risk	No adjustments made for multiple outcomes

Flory 2006

Study characteristics

Methods	Randomisation method: Computer generated block randomisation No. of centres: 1 Design: Parallel group Blinding: No No. randomised: 80 No. analysed: 63 Dropout at the end of follow up: 9/40 in subtotal group (2 after randomisation; 2 moved/wrong phone; 3 not interested; 4 other reasons); 8/40 in total group (1 after randomisation; 3 moved/wrong phone; 2 not interested; 3 other reasons) Power calculation: Yes (32 per treatment arm for moderate effect size (difference of 0.5 SD) gave 80% power, with alpha=0.05) Intention-to-treat analysis: No Source of funding: Canadian Foundation for Womens Health Institute of Health Research
Participants	Inclusion: 18-55 years old; pre-menopausal; fluent in French language Exclusion: Prior oophorectomy; prior uterine prolapse; prior chemotherapy; prior neoplasia in the uterus/cervix Age: 44 years (mean)

Flory 2006 *(Continued)*

	Source: From surgeons/gynaecologists and local media announcement, study undertaken at Department of Obstetrics and Gynecology, University of Montreal
Interventions	(1) subtotal laparoscopic hysterectomy (2) total laparoscopic assisted vaginal hysterectomy Follow up: 6 - 7 months after surgery
Outcomes	Sexual drive; sexual arousal; orgasm; sexual behaviour; overall sexual functioning; pain (Likert scale and MPQ); depression and other psychological symptoms (BDI and BSI); body image (SSS and BES); psychosocial functioning
Notes	

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer generated block randomisation
Allocation concealment (selection bias)	Low risk	Treatment assignment concealed in consecutively numbered sealed envelopes, opened by surgeons at the time of surgery
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not reported
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	>20% dropout but balanced between groups
Selective reporting (reporting bias)	Low risk	All prespecified outcomes reported
Other bias	Unclear risk	Groups not balanced at baseline (87% of women in subtotal group and 66% of women in total group had fibroids)

Ghanbari 2007

Study characteristics

Methods	Single blinded RCT
Participants	N=50; 25 randomised to subtotal abdominal hysterectomy and 25 randomised to total abdominal hysterectomy
Interventions	(1) subtotal abdominal hysterectomy; (2) total abdominal hysterectomy
Outcomes	Duration of surgery, volume of bleeding, duration of hospital stay, operative complications, dyspareunia, sexual satisfaction, ongoing bleeding

Notes

Risk of bias

Ghanbari 2007 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	Not reported
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Single blinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	No dropouts reported
Selective reporting (reporting bias)	Low risk	All prespecified outcomes reported
Other bias	Unclear risk	Possible translation bias

Gimbel 2003

Study characteristics

Methods	Randomisation method: Restricted, computer generated block randomisation No of centres: 11 Design: parallel group Blinding: No No. randomised: 319 No. analysed: 277 Dropout at end of follow up: 15% in subtotal group; 11% in total group Power calculation: yes Intention to treat analysis: Authors claimed both 'regular' ITT and per protocol analysis but 13% of randomised participants excluded from analysis Source of funding: Numerous trial groups/organisations and hospitals
Participants	Inclusion: Women who are scheduled for hysterectomy for benign disease Exclusion: Laparoscopic/vaginal hysterectomy; dysplasia (cervical); uterine prolapse; malignant disease; diabetes; participation in other research projects; unable to read/write Danish; former urological operation; cervix problems; psychological problems; poor mental function; neurological disease; chronic alcoholism. Age: 47 years (mean) Source: Departments of Obstetrics and Gynaecology in Denmark
Interventions	(1) subtotal hysterectomy (2) total abdominal hysterectomy Follow up 1 year
Outcomes	Primary: Perceived urinary incontinence Secondary: Quality of life (SF36); constipation; prolapse; satisfaction with sexual life; pelvic pain; vaginal bleeding; postoperative complications; dyspareunia

Gimbel 2003 *(Continued)*

Notes	A later publication compared the effects of interventions on sexual function (Zobbe 2003) and another later publication (Gimbel 2005) compared the effects of the interventions on a more detailed specification or urinary symptoms (stress, urge and mixed incontinence and incomplete bladder emptying)

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer generated randomisation procedure
Allocation concealment (selection bias)	Low risk	"The randomisation office was central and located outside the participating centres. Details of the generation and the generated randomisation were concealed from the Steering Committee as well as the participating centres until after the recruitment period ended".
Blinding (performance bias and detection bias) All outcomes	High risk	Authors acknowledged the "lack of blinding"
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	>10% lost to follow up - no reasons given
Selective reporting (reporting bias)	Low risk	All prespecified outcomes reported
Other bias	Low risk	Multiple sources of funding including Organon but unlikely bias because of independent data monitoring. No baseline imbalance between groups.

Gorlero 2008

Study characteristics

Methods	Randomisation method: computer generated numbers Number of centres: 1 Design: parallel group No. randomised: 117 No. analysed: 105 Dropout at end of follow up: 12/117 (10.3%) - reasons not given Power calculation: no Intention to treat analysis: no Source of funding: not stated
Participants	Inclusion: Women requiring an abdominal hysterectomy for a benign indication

Exclusion:

Gorlero2008 *(Continued)*

	2nd or 3rd degree uterine prolapse; age >75 years; malignancy; BMI>29; previous pelvic surgery; endometriosis or history of chronic pelvic pain; abnormal cervical smears; psychiatric disorders Age: subtotal hyst (mean 46 years); total hyst (mean 49 years) Source: Department of San Martino Hospital and University of Genoa in Genoa, Italy (Jan 2003 to December 2005)
Interventions	(1) subtotal hysterectomy (2) total hysterectomy Follow up: 1 year
Outcomes	Primary: Womens' satisfaction (evaluated by answers to a questionnaire on sexual activity, body image and health status) Secondary: Occurrence of surgical complications; postoperative recovery
Notes	Study measures 'satisfaction' by women's responses to questions on sexual activity, body image and quality of life

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer generated numbers
Allocation concealment (selection bias)	Low risk	Sealed opaque envelopes opened immediately before surgical incision
Blinding (performance bias and detection bias) All outcomes	High risk	Stated as not blinded
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	No reasons given for incomplete data and no information on distribution between groups
Selective reporting (reporting bias)	Low risk	All prespecified outcomes reported
Other bias	Low risk	Groups comparable at baseline and no other potential bias identified

Learman 2003

Study characteristics

Methods	Randomisation method: Computer generated random numbers sequence in blocks with sealed num-

bered opaque envelopes
Number of centres: 4
Design: parallel group
No randomised: 135

Learman 2003 *(Continued)*

	No analysed: 135 Drop out at end of follow up: 10% for subtotal hyst and 4% for total hyst Power calculation: yes Intention to treat analysis: Yes (for some outcomes) Source of funding: AHRQ Stratified by clinical centre
Participants	Inclusion: Pre-menopausal women with symptomatic fibroids who have decided to undergo abdominal hysterectomy OR pre-menopausal women who have abnormal bleeding and a minimum 3 month trial of hormonal management who want hysterectomy; if >/= 45 yrs, FSH </= 30 mIU/mL and negative biopsy within 6 months for hyperplasia/cancer Exclusion: Age >50 years; positive pregnancy test; desire for future childbearing; genital tract cancer (known or suspected); cervical dysplasia or carcinoma in situ; complex or atypical endometrial hyperplasia; candidate for vaginal hysterectomy; not geographically accessible for 4 yrs. Age: 41.8 (mean) Source: University gynaecological clinics affiliated with 4 universities in USA
Interventions	(1) subtotal hysterectomy (2) total abdominal hysterectomy Follow up: 2 yrs
Outcomes	Primary: Surgical complications and clinical outcomes: reduction in symptoms; hospital readmissions; rate of complications; degree of symptom improvement; activity limitation Secondary: Sexual function and health related quality of life
Notes	A later publication compared the effects of the interventions on sexual function and quality of life

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer generated random number sequence, stratified by centre, in blocks
Allocation concealment (selection bias)	Low risk	Sealed numbered opaque envelopes
Blinding (performance bias and detection bias) All outcomes	High risk	Unblinded
Incomplete outcome data (attrition bias) All outcomes	Low risk	Loss to follow up but reasons clearly specified
Selective reporting (reporting bias)	Low risk	All pre-specified outcomes reported
Other bias	Low risk	No baseline imbalance, funding by AHRQ

Morelli 2007

Study characteristics

Methods	Randomisation method: Computer generated No. of centres: 1 Design: Parallel group No. randomised: 141 No. analysed: 129 (primary outcome at 24 months); 141 for surgical outcomes Dropout at end of follow up: Subtotal group: 8/71 (11.3%) - 1 death, 7 lost to follow up. Total group: 4/70 (5.7%) - 1 death, 3 lost to follow up Power calculation: Not reported Intention to treat analysis: No for primary outcomes but surgical outcomes were ITT. Source of funding: Not reported
Participants	Inclusion: Age >30 years; pre-menopausal; abnormal uterine bleeding with previous hormonal treatment for at least 3 months and diagnosis confirmed by echo or hysteroscopy OR symptomatic uterine leiomyomas (bleeding, compression etc) with diagnosis confirmed by echo or hysteroscopy OR patients >45 years with FSH ≤30 mIU/ml and negative endometrial biopsy for hyperplasia or carcinoma. Exclusion: Pregnancy; age >50 years; planned pregnancy; diagnosed or suspected genital cancer; dysplasia; endometrial hyperplasia; candidate for vaginal hysterectomy Age: Mean 42 years Source: Not reported - all patients identified through a vaginal screening program in Catanzaro, Italy
Interventions	(1) subtotal laparoscopic hysterectomy (2) total laparoscopic hysterectomy (both using standard surgery procedures) Follow up: 24 months after surgery
Outcomes	Surgical outcomes: operation time, blood loss, other operative complications; readmission to hospital during follow up; irregular bleeding; pelvic pain; pelvic compression; lumbar pain; urinary urgency; sensation of incomplete emptying of bladder; stress incontinence
Notes	Publication translated from Italian into English by Lorenzo Moja of the Italian Cochrane Centre

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer generated
Allocation concealment (selection bias)	Unclear risk	Not reported
Blinding (performance bias and detection bias) All outcomes	Unclear risk	Not reported but unlikely

Incomplete outcome data (attrition bias)	Low risk	Reasons clearly specified for dropouts before the conclusion of the trial at 24 months

Morelli 2007 *(Continued)*

All outcomes		
Selective reporting (reporting bias)	Low risk	All prespecified outcomes reported
Other bias	Low risk	Groups balanced at baseline. No other possible bias identified.

Persson 2010

Study characteristics

Methods	Randomisation method: Random numbers table with block randomisation according to centre No. of centres: 8 Design: Parallel group No. randomised: 200 No. analysed: 178 Dropout at end of follow up: Subtotal group: 5/104 withdrew consent prior to surgery, 4/104 withdrew consent during study period and 1/104 missing diary. Total group: 3/96 withdrew consent prior to surgery, 2/96 intraoperative finding of cancer, 1/96 converted to subtotal hysterectomy, 1/96 protocol violation, 5/96 withdrew consent during study period, 1/96 missing diary Power calculation: Yes: difference in PGWB score of 8 points Intention to treat analysis: Stated as intention to treat but 10% of subtotal and 13% of total group not included in the analyses Source of funding: Medical Research Council of south-east Sweden and County Council of Ostergotland and Linkoping University
Participants	Inclusion: Planned hysterectomy for benign gynaecological condition, proficiency in Swedish, preservation of at least one ovary Exclusion: Malignancy in genital organs, previous or present cervical dysplasia, rapidly growing fibroids where malignancy could not be ruled out, preoperative treatment with GnRH analogues, postmenopausal women without hormone replacement therapy, severe psychiatric disorders Age: Mean 46 years Source: Patients identified from seven hospitals and one private gynaecological clinic in Sweden - admitted for hysterectomy because of benign gynaecological conditions
Interventions	(1) subtotal abdominal hysterectomy (2) total abdominal hysterectomy (both techniques according to surgeon discretion) Follow up: 12 months after surgery
Outcomes	Primary: General psychological wellbeing Secondary: Post-operative complications (including stress incontinence), surgical and clinical outcomes during surgery
Notes	Two publications

Persson 2010 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random numbers table with block randomisation according to centre
Allocation concealment (selection bias)	Low risk	"Opaque envelopes numbered sequentially in accordance with random table, opened consecutively"
Blinding (performance bias and detection bias) All outcomes	High risk	"Women informed about their assignment prior to surgery"
Incomplete outcome data (attrition bias) All outcomes	Low risk	"Missing outcome data balanced in numbers across intervention groups with similar reasons for missing data across groups"
Selective reporting (reporting bias)	Low risk	All prespecified outcomes reported
Other bias	Low risk	Comparison groups balanced at baseline. No pharmaceutical funding.

Thakar 2002

Study characteristics

Methods	Randomisation method: Computer generated numbers and sealed opaque envelopes opened after surgical incision made. No of centres: 2 Design: parallel group Blinding: double (participants and investigator for 1 year of trial) No randomised: 279 No analysed: 279 (only for peri-operative outcomes) Dropout at end of follow up: 8% in subtotal group; 14% in total group Power calculation for sample size: yes Intention to treat analysis: yes for some outcomes, but some data not available for analysis of primary outcomes Source of funding: Responsive Funding Program, Research and Development; NHS Executive; London.
Participants	Inclusion: Women offered abdominal hysterectomy for a benign indication Exclusion: >60 years; suspected carcinoma; body weight >100 kg; previous pelvic surgery; known endometriosis; abnormal cervical smears; symptomatic uterine prolapse; symptomatic urinary incontinence Age: 43-44 (mean) Source: 2 London hospitals in the UK (Jan 1996 to Apr 2000)
Interventions	(1) subtotal hysterectomy (2) total abdominal hysterectomy Follow up: 1 yr
Outcomes	Primary: Bowel, bladder and sexual function Secondary:

Thakar 2002 *(Continued)*

	Postoperative complications; intra-operative outcomes and complications; readmission rate; changes in psychological outcomes and health status/quality of life
Notes	A later publication (Thakar 2004) compared the effects of the interventions on health status/quality of life and psychological outcomes and another later publication (Thakar 2005) compared the effects of the interventions on longer follow up (7 to 11 years after surgery).

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer generated numbers
Allocation concealment (selection bias)	Low risk	Sealed opaque envelopes only opened after surgical incision
Blinding (performance bias and detection bias) All outcomes	Low risk	Participants and investigators blinded for 1 year
Incomplete outcome data (attrition bias) All outcomes	Low risk	Clear explanations given for missing data but analysis at 9 years undertaken on 65% of original study group
Selective reporting (reporting bias)	Low risk	All pre-specified outcomes reported
Other bias	Low risk	No baseline imbalance, funding by research program

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Ahmed 2017	ClinicalTrials register
Ala-Nissilä 2017	Not RCT
Andersen 2014	ClinicalTrials register
Berlit 2018	Not RCT
Einarsson 2010	Not RCT - does not mention randomisation to groups
Gimbel 2007	Meta-analysis, not RCT
Kives 2010	Guideline on subtotal hysterectomy, not RCT
Lalos 1986	Did not measure one or more of the primary outcomes for the review
Lyons 1993	Not randomised

Radosa 2014	Not RCT

Study	Reason for exclusion
Robert 2008	Meta-analysis, not RCT
Roussis 2004	Not RCT
Showstack 2004	Resource use for total and supracervical hysterectomy was compared. These outcomes are not relevant to the review
Wallwiener 2013	Not RCT

Characteristics of studies awaiting classification *[ordered by study ID]*

Wisa 2013

Methods	Double blinded RCT
Participants	N=50; N=? randomised to subtotal laparoscopic hysterectomy and N=? randomised to total laparoscopic hysterectomy
Interventions	(1) subtotal laparoscopic hysterectomy; (2) total laparoscopic hysterectomy
Outcomes	Sexual function, urinary symptoms,
Notes	Awaiting full study text - have contacted several times the authors

DATA AND ANALYSES

Comparison 1. Subtotal hysterectomy versus total hysterectomy

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.1 Prevalence of stress urinary incontinence within 2 years post surgery	5	955	Odds Ratio (M-H, Fixed, 95% CI)	1.45 [0.85, 2.47]
1.1.1 Abdominal surgery	4	826	Odds Ratio (M-H, Fixed, 95% CI)	1.55 [0.86, 2.78]
1.1.2 Laparoscopic surgery	1	129	Odds Ratio (M-H, Fixed, 95% CI)	1.05 [0.29, 3.82]
1.2 Prevalence of stress urinary incontinence >2 years post surgery	4	540	Odds Ratio (M-H, Fixed, 95% CI)	1.53 [1.08, 2.18]
1.2.1 Abdominal surgery	4	540	Odds Ratio (M-H, Fixed, 95% CI)	1.53 [1.08, 2.18]
1.2.2 Laparoscopic surgery	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable

Outcome or subgroup title	No. of studies	No. of partici-pants	Statistical method	Effect size
1.3 Prevalence of incomplete bladder emptying within 2 years post surgery	4	768	Odds Ratio (M-H, Fixed, 95% CI)	0.94 [0.59, 1.47]
1.3.1 Abdominal surgery	3	639	Odds Ratio (M-H, Fixed, 95% CI)	0.89 [0.55, 1.45]
1.3.2 Laparoscopic surgery	1	129	Odds Ratio (M-H, Fixed, 95% CI)	1.28 [0.37, 4.44]
1.4 Prevalence of incomplete bladder emptying >2 years post surgery	4	535	Odds Ratio (M-H, Fixed, 95% CI)	0.68 [0.43, 1.07]
1.4.1 Abdominal surgery	4	535	Odds Ratio (M-H, Fixed, 95% CI)	0.68 [0.43, 1.07]
1.4.2 Laparoscopic surgery	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
1.5 Prevalence of urinary urgency within 2 years post surgery	2	254	Odds Ratio (M-H, Fixed, 95% CI)	1.05 [0.47, 2.37]
1.5.1 Abdominal surgery	1	125	Odds Ratio (M-H, Fixed, 95% CI)	0.86 [0.25, 2.99]
1.5.2 Laparoscopic surgery	1	129	Odds Ratio (M-H, Fixed, 95% CI)	1.23 [0.42, 3.61]
1.6 Prevalence of urinary urgency >2 years post surgery	4	536	Odds Ratio (M-H, Fixed, 95% CI)	1.05 [0.72, 1.53]
1.6.1 Abdominal surgery	4	536	Odds Ratio (M-H, Fixed, 95% CI)	1.05 [0.72, 1.53]
1.6.2 Laparoscopic surgery	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
1.7 Prevalence of constipation within 2 years post surgery	2	555	Odds Ratio (M-H, Random, 95% CI)	0.71 [0.25, 1.99]
1.7.1 Abdominal surgery	2	555	Odds Ratio (M-H, Random, 95% CI)	0.71 [0.25, 1.99]
1.7.2 Laparoscopic surgery	0	0	Odds Ratio (M-H, Random, 95% CI)	Not estimable
1.8 Prevalence of constipation >2 years post surgery	3	490	Odds Ratio (M-H, Fixed, 95% CI)	1.68 [0.93, 3.03]
1.8.1 Abdominal surgery	3	490	Odds Ratio (M-H, Fixed, 95% CI)	1.68 [0.93, 3.03]
1.8.2 Laparoscopic surgery	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
1.9 Prevalence of fecal inconti-nence within 2 years post surgery	1	166	Odds Ratio (M-H, Fixed, 95% CI)	0.52 [0.05, 5.83]
1.9.1 Abdominal surgery	1	166	Odds Ratio (M-H, Fixed, 95% CI)	0.52 [0.05, 5.83]
1.9.2 Laparoscopic surgery	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
1.10 Prevalence of fecal inconti-nence >2 years post surgery	2	294	Odds Ratio (M-H, Fixed, 95% CI)	0.63 [0.10, 3.85]

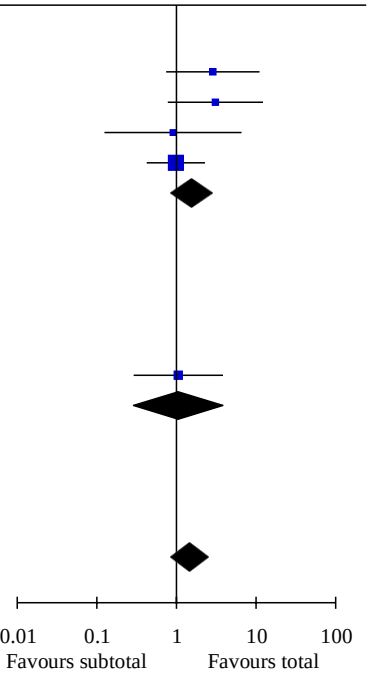
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.10.1 Abdominal surgery	2	294	Odds Ratio (M-H, Fixed, 95% CI)	0.63 [0.10, 3.85]
1.10.2 Laparoscopic surgery	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
1.11 Satisfaction with sex (dichotomous data) within 2 years post surgery	3	504	Odds Ratio (M-H, Random, 95% CI)	1.19 [0.62, 2.32]
1.11.1 Abdominal surgery	3	504	Odds Ratio (M-H, Random, 95% CI)	1.19 [0.62, 2.32]
1.11.2 Laparoscopic surgery	0	0	Odds Ratio (M-H, Random, 95% CI)	Not estimable
1.12 Satisfaction with sex (dichotomous data) >2 years post surgery	2	284	Odds Ratio (M-H, Fixed, 95% CI)	0.85 [0.45, 1.60]
1.12.1 Abdominal hysterectomy	2	284	Odds Ratio (M-H, Fixed, 95% CI)	0.85 [0.45, 1.60]
1.12.2 Laparoscopic hysterectomy	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
1.13 Satisfaction with sex (continuous data) within 2 years post surgery	2	192	Std. Mean Difference (IV, Fixed, 95% CI)	-0.15 [-0.43, 0.13]
1.13.1 Abdominal surgery	1	129	Std. Mean Difference (IV, Fixed, 95% CI)	-0.04 [-0.39, 0.30]
1.13.2 Laparoscopic surgery	1	63	Std. Mean Difference (IV, Fixed, 95% CI)	-0.37 [-0.87, 0.13]
1.15 Prevalence of dyspareunia within 2 years post surgery	2	452	Odds Ratio (M-H, Random, 95% CI)	0.83 [0.24, 2.90]
1.15.1 Abdominal surgery	2	452	Odds Ratio (M-H, Random, 95% CI)	0.83 [0.24, 2.90]
1.15.2 Laparoscopic surgery	0	0	Odds Ratio (M-H, Random, 95% CI)	Not estimable
1.16 Prevalence of dyspareunia >2 years post surgery	1	133	Odds Ratio (M-H, Fixed, 95% CI)	0.56 [0.25, 1.23]
1.16.1 Abdominal surgery	1	133	Odds Ratio (M-H, Fixed, 95% CI)	0.56 [0.25, 1.23]
1.16.2 Laparoscopic surgery	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
1.17 Quality of life within 2 years post abdominal surgery (high better)	5	1961	Mean Difference (IV, Fixed, 95% CI)	0.12 [-0.42, 0.66]
1.17.1 General (abdominal)	3	478	Mean Difference (IV, Fixed, 95% CI)	0.35 [-0.27, 0.97]
1.17.2 Physical domain (abdominal)	3	652	Mean Difference (IV, Fixed, 95% CI)	-0.52 [-2.18, 1.14]
1.17.3 Mental domain (abdominal)	4	831	Mean Difference (IV, Fixed, 95% CI)	-0.61 [-2.05, 0.82]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.18 Quality of life within 2 years post abdominal surgery (low better)	2	663	Mean Difference (IV, Fixed, 95% CI)	-0.27 [-1.39, 0.84]
1.18.1 General (abdominal)	1	179	Mean Difference (IV, Fixed, 95% CI)	-1.00 [-4.92, 2.92]
1.18.2 Anxiety (abdominal)	1	179	Mean Difference (IV, Fixed, 95% CI)	0.20 [-2.68, 3.08]
1.18.3 Depression (abdominal and laparoscopic)	2	242	Mean Difference (IV, Fixed, 95% CI)	-0.27 [-1.55, 1.00]
1.18.4 Psychological domain (laparoscopic)	1	63	Mean Difference (IV, Fixed, 95% CI)	-2.00 [-15.66, 11.66]
1.19 Operating time (mins)	8	991	Mean Difference (IV, Random, 95% CI)	-13.11 [-17.56, -8.66]
1.19.1 Abdominal surgery	5	744	Mean Difference (IV, Random, 95% CI)	-11.81 [-15.55, -8.07]
1.19.2 Laparoscopic surgery	3	247	Mean Difference (IV, Random, 95% CI)	-16.61 [-30.50, -2.72]
1.20 Length of hospital stay (days)	7	1030	Mean Difference (IV, Random, 95% CI)	-0.24 [-0.44, -0.04]
1.20.1 Abdominal surgery	5	844	Mean Difference (IV, Random, 95% CI)	-0.17 [-0.39, 0.04]
1.20.2 Laparoscopic surgery	2	186	Mean Difference (IV, Random, 95% CI)	-0.42 [-0.95, 0.11]
1.21 Return to normal activities (weeks)	3	355	Mean Difference (IV, Fixed, 95% CI)	-0.28 [-0.64, 0.08]
1.21.1 Abdominal surgery	2	310	Mean Difference (IV, Fixed, 95% CI)	-0.14 [-0.53, 0.25]
1.21.2 Laparoscopic surgery	1	45	Mean Difference (IV, Fixed, 95% CI)	-1.15 [-2.14, -0.16]
1.22 Requirement for blood transfusion	6	880	Odds Ratio (M-H, Fixed, 95% CI)	1.37 [0.75, 2.51]
1.22.1 Abdominal surgery	4	694	Odds Ratio (M-H, Fixed, 95% CI)	1.24 [0.61, 2.54]
1.22.2 Laparoscopic surgery	2	186	Odds Ratio (M-H, Fixed, 95% CI)	1.75 [0.56, 5.52]
1.23 Blood loss during surgery (mls)	5	780	Mean Difference (IV, Random, 95% CI)	-81.22 [-153.23, -9.22]
1.23.1 Abdominal surgery	4	639	Mean Difference (IV, Random, 95% CI)	-94.91 [-183.89, -5.93]
1.23.2 Laparoscopic surgery	1	141	Mean Difference (IV, Random, 95% CI)	-36.00 [-145.35, 73.35]
1.24 Short term complications (predischarge)	6	5199	Odds Ratio (M-H, Fixed, 95% CI)	0.51 [0.38, 0.69]
1.24.1 Surgical injury	3	549	Odds Ratio (M-H, Fixed, 95% CI)	0.28 [0.06, 1.36]
1.24.2 Pelvic haematoma/abscess	3	660	Odds Ratio (M-H, Fixed, 95% CI)	0.41 [0.13, 1.32]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.24.3 Vaginal bleeding	3	660	Odds Ratio (M-H, Fixed, 95% CI)	0.74 [0.29, 1.91]
1.24.4 Wound infection	3	733	Odds Ratio (M-H, Fixed, 95% CI)	0.86 [0.38, 1.95]
1.24.5 Pyrexia (fever)	5	933	Odds Ratio (M-H, Fixed, 95% CI)	0.48 [0.31, 0.75]
1.24.6 Urinary retention	5	933	Odds Ratio (M-H, Fixed, 95% CI)	0.23 [0.06, 0.81]
1.24.7 Bowel obstruction/ileus	4	731	Odds Ratio (M-H, Fixed, 95% CI)	0.59 [0.24, 1.46]
1.25 Intermediate term complications (after discharge and within 2 years post surgery)	7	3386	Odds Ratio (M-H, Random, 95% CI)	2.22 [1.15, 4.26]
1.25.1 Ongoing cyclical bleeding	7	1068	Odds Ratio (M-H, Random, 95% CI)	8.96 [3.03, 26.53]
1.25.2 Persistent pain	5	963	Odds Ratio (M-H, Random, 95% CI)	0.92 [0.59, 1.42]
1.25.3 Removal of cervical stump	2	457	Odds Ratio (M-H, Random, 95% CI)	5.14 [0.60, 44.35]
1.25.4 Pelvic prolapse	5	898	Odds Ratio (M-H, Random, 95% CI)	1.24 [0.40, 3.80]
1.25.5 Gynaecological cancer	0	0	Odds Ratio (M-H, Random, 95% CI)	Not estimable
1.26 Long term complications (>2 years post surgery)	3	445	Odds Ratio (M-H, Fixed, 95% CI)	0.98 [0.63, 1.51]
1.26.1 Fistula	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
1.26.2 Pelvic prolapse	3	445	Odds Ratio (M-H, Fixed, 95% CI)	0.98 [0.63, 1.51]
1.26.3 Gynaecological cancer	0	0	Odds Ratio (M-H, Fixed, 95% CI)	Not estimable
1.27 Alleviation of pre-surgery symptoms	2	814	Odds Ratio (M-H, Fixed, 95% CI)	1.09 [0.72, 1.64]
1.27.1 Back pain	2	266	Odds Ratio (M-H, Fixed, 95% CI)	1.33 [0.78, 2.27]
1.27.2 Pelvic pressure	2	266	Odds Ratio (M-H, Fixed, 95% CI)	0.69 [0.28, 1.68]
1.27.3 Menstrual abnormalities	1	141	Odds Ratio (M-H, Fixed, 95% CI)	3.00 [0.12, 74.90]
1.27.4 Pelvic pain	1	141	Odds Ratio (M-H, Fixed, 95% CI)	0.86 [0.31, 2.38]
1.28 Readmission rate (related to surgery)	6	1069	Odds Ratio (M-H, Fixed, 95% CI)	1.21 [0.75, 1.94]
1.28.1 Abdominal surgery	4	869	Odds Ratio (M-H, Fixed, 95% CI)	1.10 [0.63, 1.91]
1.28.2 Laparoscopic surgery	2	200	Odds Ratio (M-H, Fixed, 95% CI)	1.58 [0.61, 4.07]

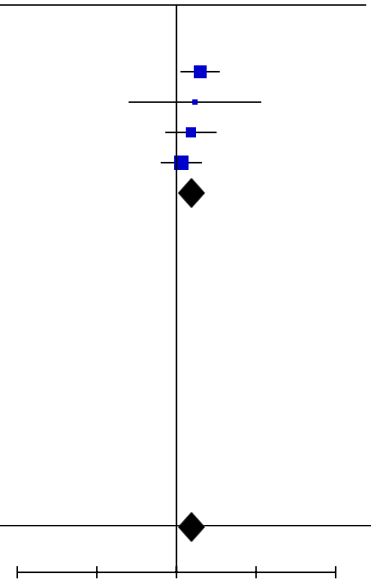
Analysis 1.1. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 1: Prevalence of stress urinary incontinence within 2 years post surgery

Study or Subgroup	Subtotal hyst Events	Subtotal hyst Total	Total hyst Events	Total hyst Total	Weight	Odds Ratio M-H, Fixed, 95% CI
1.1.1 Abdominal surgery						
Gimbel 2003	8	136	3	140	12.2%	2.85 [0.74 , 10.99]
Learman 2003	8	61	3	64	11.2%	3.07 [0.77 , 12.16]
Persson 2010	2	94	2	85	9.0%	0.90 [0.12 , 6.55]
Thakar 2002	12	124	12	122	47.9%	0.98 [0.42 , 2.28]
Subtotal (95% CI)		**415**		**411**	**80.3%**	**1.55 [0.86 , 2.78]**
Total events:	30		20			
Heterogeneity: Chi² = 3.15, df = 3 (P = 0.37); I² = 5%						
Test for overall effect: Z = 1.46 (P = 0.14)						
1.1.2 Laparoscopic surgery						
Morelli 2007	5	63	5	66	19.7%	1.05 [0.29 , 3.82]
Subtotal (95% CI)		**63**		**66**	**19.7%**	**1.05 [0.29 , 3.82]**
Total events:	5		5			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.08 (P = 0.94)						
Total (95% CI)		**478**		**477**	**100.0%**	**1.45 [0.85 , 2.47]**
Total events:	35		25			
Heterogeneity: Chi² = 3.39, df = 4 (P = 0.50); I² = 0%						
Test for overall effect: Z = 1.37 (P = 0.17)						
Test for subgroup differences: Chi² = 0.29, df = 1 (P = 0.59), I² = 0%						



Analysis 1.2. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 2: Prevalence of stress urinary incontinence >2 years post surgery

Study or Subgroup	Subtotal hyst Events	Subtotal hyst Total	Total hyst Events	Total hyst Total	Weight	Odds Ratio M-H, Fixed, 95% CI
1.2.1 Abdominal surgery						
Gimbel 2003	60	97	45	100	33.7%	1.98 [1.12 , 3.50]
Learman 2003	3	18	2	19	3.2%	1.70 [0.25 , 11.59]
Persson 2010	27	70	17	58	22.8%	1.51 [0.72 , 3.18]
Thakar 2002	53	89	50	89	40.3%	1.15 [0.63 , 2.08]
Subtotal (95% CI)		**274**		**266**	**100.0%**	**1.53 [1.08 , 2.18]**
Total events:	143		114			
Heterogeneity: Chi² = 1.70, df = 3 (P = 0.64); I² = 0%						
Test for overall effect: Z = 2.37 (P = 0.02)						
1.2.2 Laparoscopic surgery						
Subtotal (95% CI)		**0**		**0**		**Not estimable**
Total events:	0		0			
Heterogeneity: Not applicable						
Test for overall effect: Not applicable						



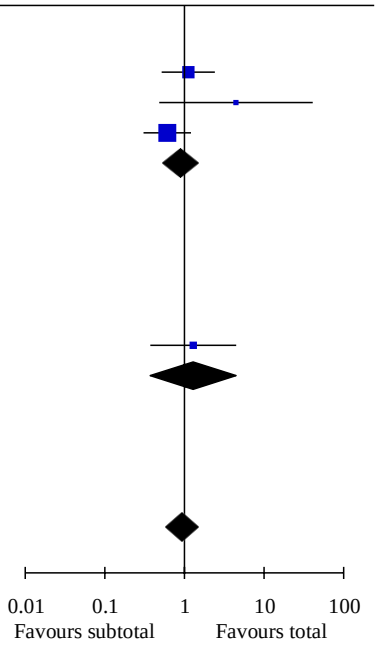
Total (95% CI)	**274**	**266**	**100.0%**	**1.53 [1.08 , 2.18]**	
Total events:	143	114			

Heterogeneity: Chi² = 1.70, df = 3 (P = 0.64); I² = 0%
Test for overall effect: Z = 2.37 (P = 0.02)
Test for subgroup differences: Not applicable

0.01 0.1 1 10 100
Favours subtotal Favours total

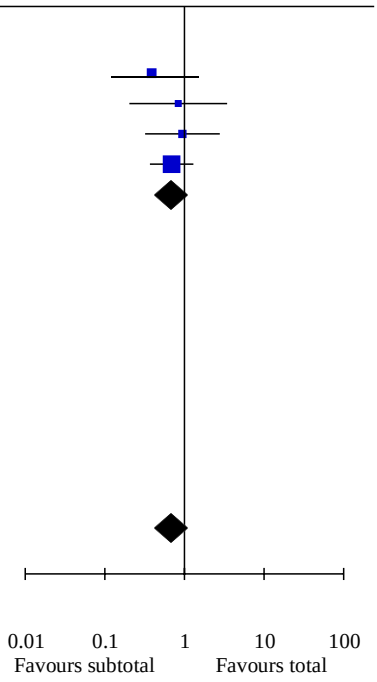
Analysis 1.3. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 3: Prevalence of incomplete bladder emptying within 2 years post surgery

Study or Subgroup	Subtotal hyst Events	Subtotal hyst Total	Total hyst Events	Total hyst Total	Weight	Odds Ratio M-H, Fixed, 95% CI
1.3.1 Abdominal surgery						
Gimbel 2003	15	136	14	140	31.6%	1.12 [0.52 , 2.41]
Learman 2003	4	61	1	64	2.3%	4.42 [0.48 , 40.72]
Thakar 2002	16	117	25	121	54.7%	0.61 [0.31 , 1.21]
Subtotal (95% CI)		**314**		**325**	**88.6%**	**0.89 [0.55 , 1.45]**
Total events:	35		40			
Heterogeneity: Chi² = 3.51, df = 2 (P = 0.17); I² = 43%						
Test for overall effect: Z = 0.47 (P = 0.64)						
1.3.2 Laparoscopic surgery						
Morelli 2007	6	63	5	66	11.4%	1.28 [0.37 , 4.44]
Subtotal (95% CI)		**63**		**66**	**11.4%**	**1.28 [0.37 , 4.44]**
Total events:	6		5			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.40 (P = 0.69)						
Total (95% CI)		**377**		**391**	**100.0%**	**0.94 [0.59 , 1.47]**
Total events:	41		45			
Heterogeneity: Chi² = 3.84, df = 3 (P = 0.28); I² = 22%						
Test for overall effect: Z = 0.29 (P = 0.77)						
Test for subgroup differences: Chi² = 0.29, df = 1 (P = 0.59), I² = 0%						



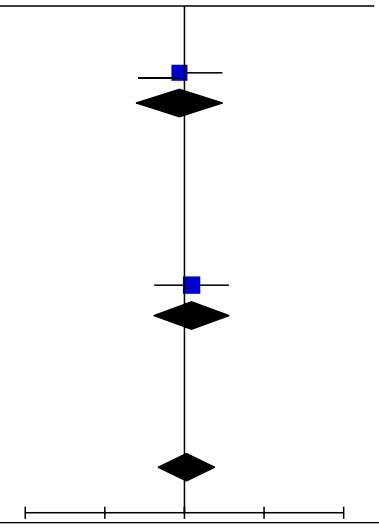
Analysis 1.4. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 4: Prevalence of incomplete bladder emptying >2 years post surgery

Study or Subgroup	Subtotal hyst Events	Subtotal hyst Total	Total hyst Events	Total hyst Total	Weight	Odds Ratio M-H, Fixed, 95% CI
1.4.1 Abdominal surgery						
Gimbel 2003	4	97	10	100	21.4%	0.39 [0.12 , 1.28]
Learman 2003	5	18	6	19	9.6%	0.83 [0.20 , 3.43]
Persson 2010	8	70	7	58	15.4%	0.94 [0.32 , 2.77]
Thakar 2002	27	87	34	86	53.6%	0.69 [0.37 , 1.29]
Subtotal (95% CI)		**272**		**263**	**100.0%**	**0.68 [0.43 , 1.07]**
Total events:	44		57			
Heterogeneity: Chi² = 1.28, df = 3 (P = 0.73); I² = 0%						
Test for overall effect: Z = 1.66 (P = 0.10)						
1.4.2 Laparoscopic surgery						
Subtotal (95% CI)		**0**		**0**		**Not estimable**
Total events:	0		0			
Heterogeneity: Not applicable						
Test for overall effect: Not applicable						
Total (95% CI)		**272**		**263**	**100.0%**	**0.68 [0.43 , 1.07]**
Total events:	44		57			
Heterogeneity: Chi² = 1.28, df = 3 (P = 0.73); I² = 0%						
Test for overall effect: Z = 1.66 (P = 0.10)						
Test for subgroup differences: Not applicable						

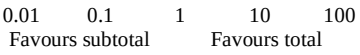


Analysis 1.5. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 5: Prevalence of urinary urgency within 2 years post surgery

Study or Subgroup	Subtotal hyst Events	Subtotal hyst Total	Total hyst Events	Total hyst Total	Weight	Odds Ratio M-H, Fixed, 95% CI
1.5.1 Abdominal surgery						
Learman 2003	5	61	6	64	47.4%	0.86 [0.25 , 2.99]
Subtotal (95% CI)		**61**		**64**	**47.4%**	**0.86 [0.25 , 2.99]**
Total events:	5		6			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.23 (P = 0.82)						
1.5.2 Laparoscopic surgery						
Morelli 2007	8	63	7	66	52.6%	1.23 [0.42 , 3.61]
Subtotal (95% CI)		**63**		**66**	**52.6%**	**1.23 [0.42 , 3.61]**
Total events:	8		7			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.37 (P = 0.71)						
Total (95% CI)		**124**		**130**	**100.0%**	**1.05 [0.47 , 2.37]**
Total events:	13		13			

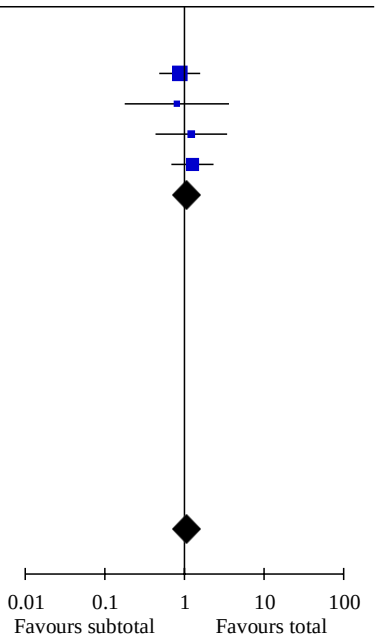


Heterogeneity: Chi² = 0.17, df = 1 (P = 0.68); I² = 0%
Test for overall effect: Z = 0.13 (P = 0.90)
Test for subgroup differences: Chi² = 0.17, df = 1 (P = 0.68), I² = 0%



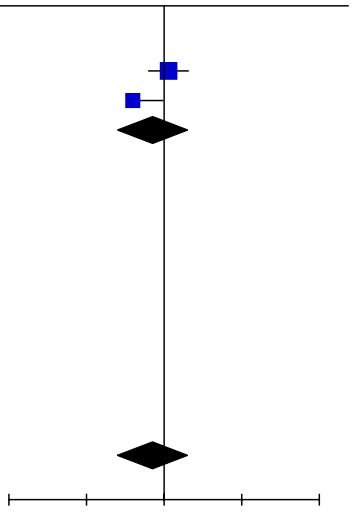
Analysis 1.6. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 6: Prevalence of urinary urgency >2 years post surgery

Study or Subgroup	Subtotal hyst Events	Total	Total hyst Events	Total	Weight	Odds Ratio M-H, Fixed, 95% CI
1.6.1 Abdominal surgery						
Gimbel 2003	31	97	35	100	44.9%	0.87 [0.48 , 1.58]
Learman 2003	4	18	5	19	7.3%	0.80 [0.18 , 3.62]
Persson 2010	10	70	7	58	12.6%	1.21 [0.43 , 3.42]
Thakar 2002	56	88	50	86	35.2%	1.26 [0.68 , 2.32]
Subtotal (95% CI)		**273**		**263**	**100.0%**	**1.05 [0.72 , 1.53]**
Total events:	101		97			
Heterogeneity: Chi² = 0.92, df = 3 (P = 0.82); I² = 0%						
Test for overall effect: Z = 0.24 (P = 0.81)						
1.6.2 Laparoscopic surgery						
Subtotal (95% CI)		**0**		**0**		**Not estimable**
Total events:	0		0			
Heterogeneity: Not applicable						
Test for overall effect: Not applicable						
Total (95% CI)		**273**		**263**	**100.0%**	**1.05 [0.72 , 1.53]**
Total events:	101		97			
Heterogeneity: Chi² = 0.92, df = 3 (P = 0.82); I² = 0%						
Test for overall effect: Z = 0.24 (P = 0.81)						
Test for subgroup differences: Not applicable						

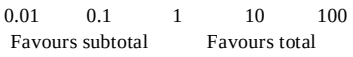


Analysis 1.7. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 7: Prevalence of constipation within 2 years post surgery

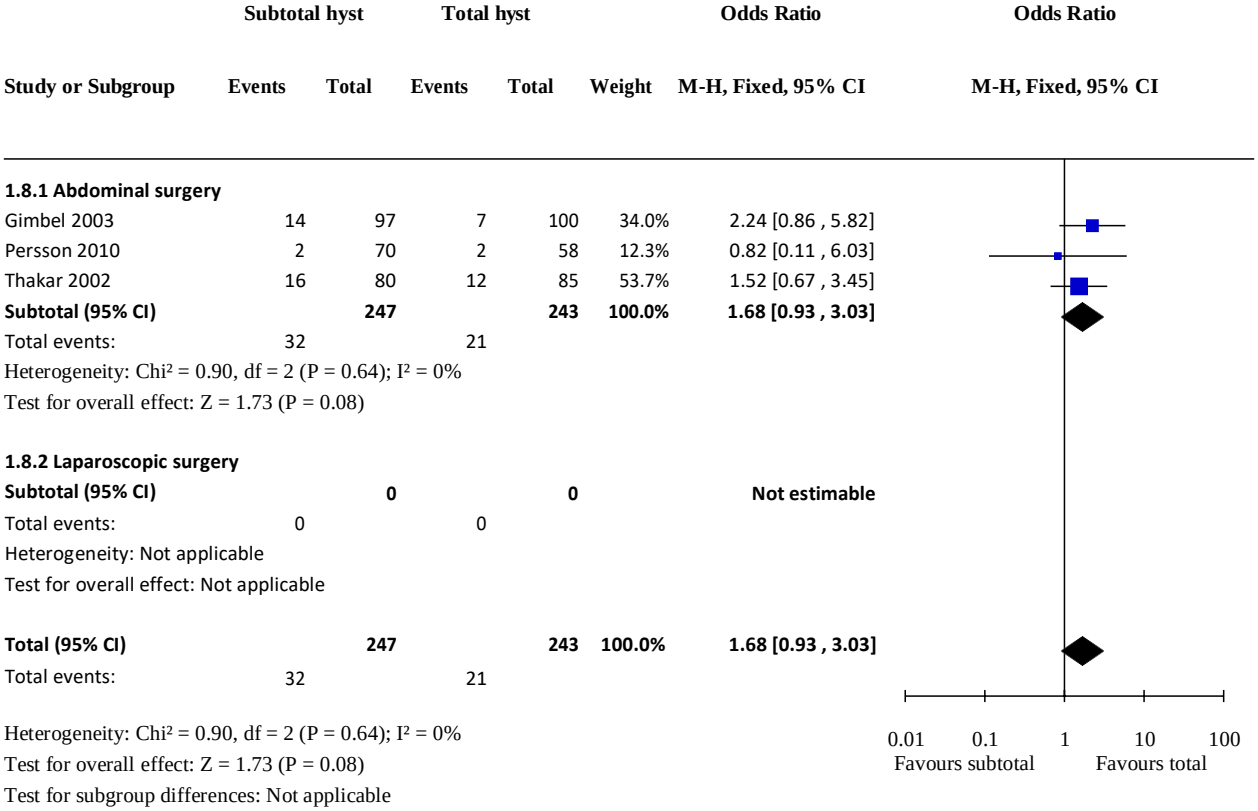
Study or Subgroup	Subtotal hyst Events	Total	Total hyst Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
1.7.1 Abdominal surgery						
Gimbel 2003	27	136	25	140	55.3%	1.14 [0.62 , 2.08]
Thakar 2002	7	133	18	146	44.7%	0.40 [0.16 , 0.98]
Subtotal (95% CI)		**269**		**286**	**100.0%**	**0.71 [0.25 , 1.99]**
Total events:	34		43			
Heterogeneity: Tau² = 0.41; Chi² = 3.64, df = 1 (P = 0.06); I² = 73%						
Test for overall effect: Z = 0.65 (P = 0.52)						
1.7.2 Laparoscopic surgery						
Subtotal (95% CI)		**0**		**0**		**Not estimable**
Total events:	0		0			
Heterogeneity: Not applicable						
Test for overall effect: Not applicable						
Total (95% CI)		**269**		**286**	**100.0%**	**0.71 [0.25 , 1.99]**
Total events:	34		43			



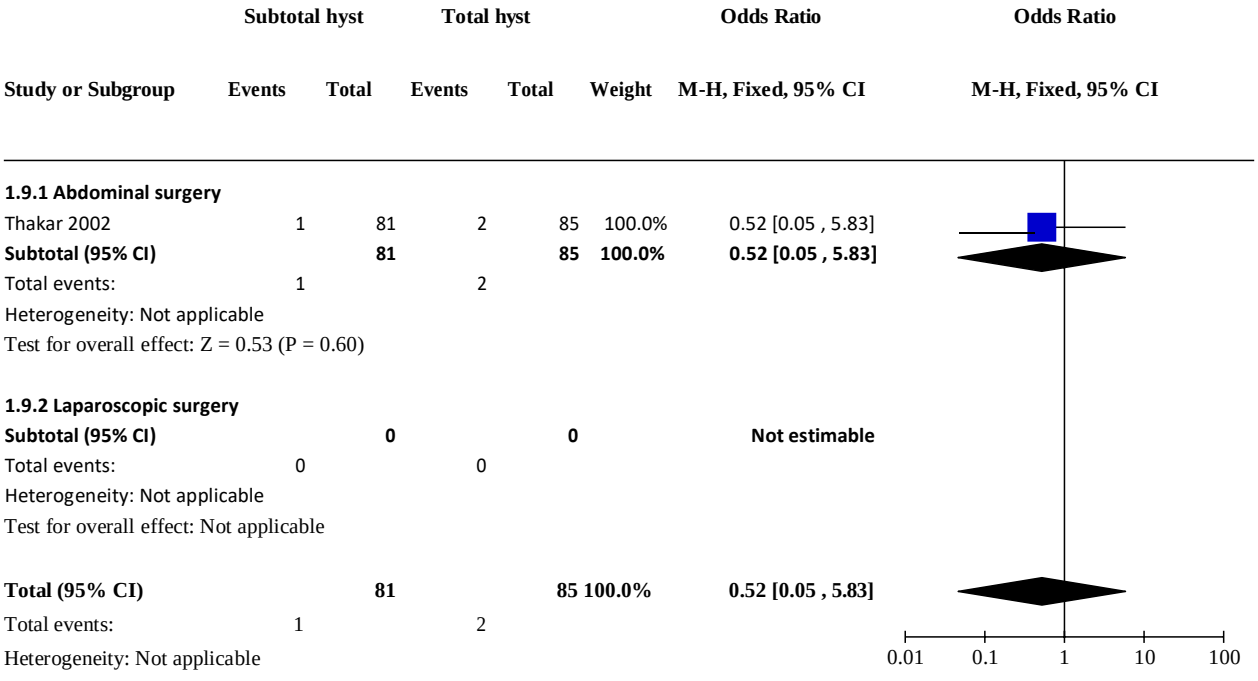
Heterogeneity: Tau² = 0.41; Chi² = 3.64, df = 1 (P = 0.06); I² = 73%
Test for overall effect: Z = 0.65 (P = 0.52)
Test for subgroup differences: Not applicable



Analysis 1.8. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 8: Prevalence of constipation >2 years post surgery

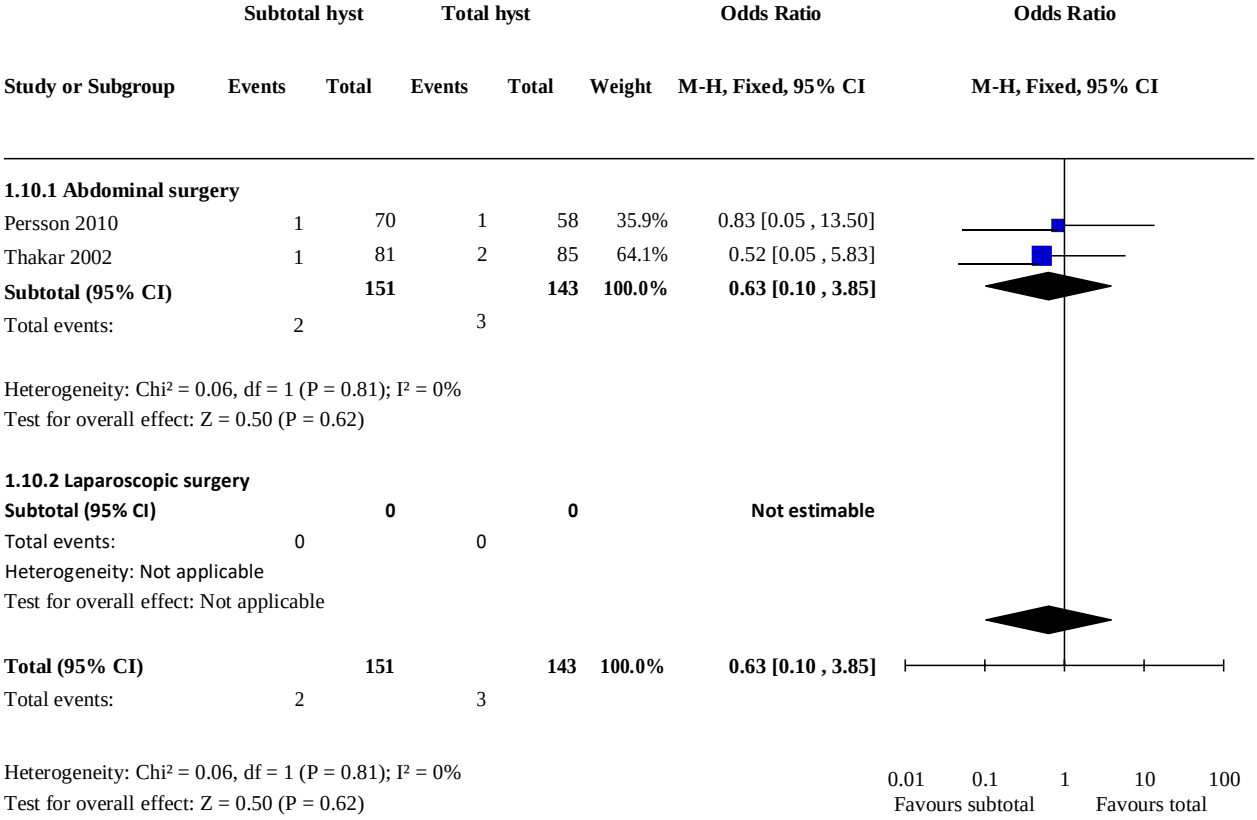


Analysis 1.9. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 9: Prevalence of fecal incontinence within 2 years post surgery

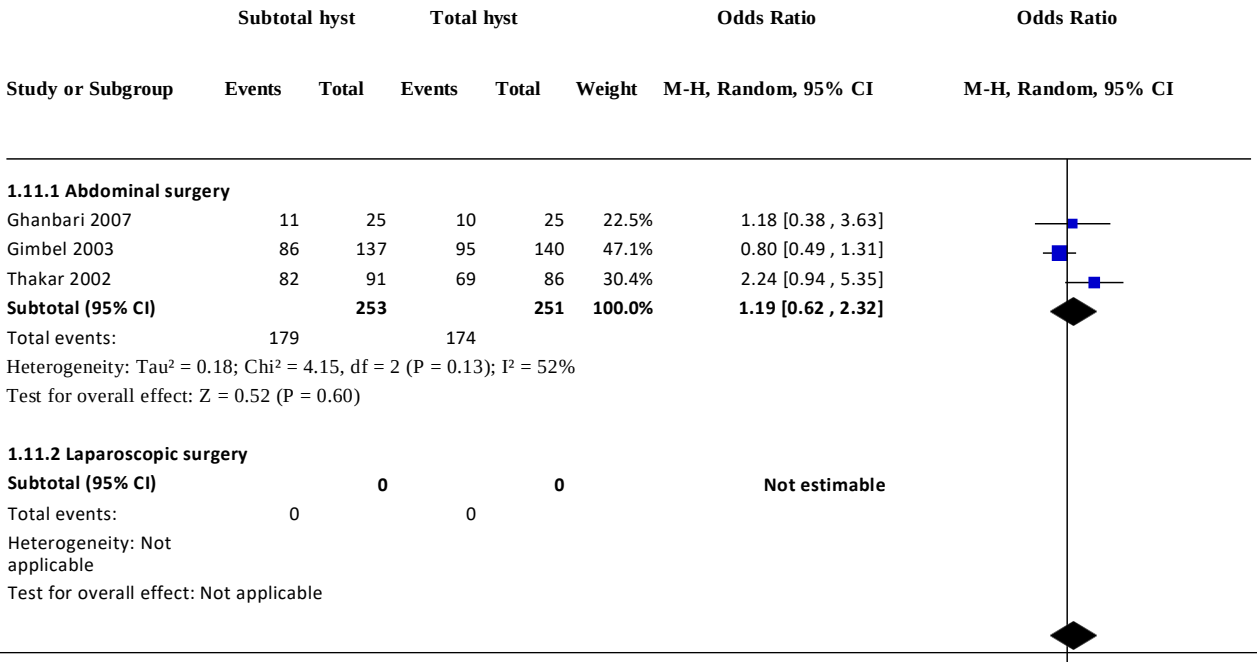


Test for overall effect: Z = 0.53 (P = 0.60) Favours subtotal Favours total
Test for subgroup differences: Not applicable

Analysis 1.10. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 10: Prevalence of fecal incontinence >2 years post surgery

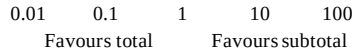


Analysis 1.11. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 11: Satisfaction with sex (dichotomous data) within 2 years post surgery

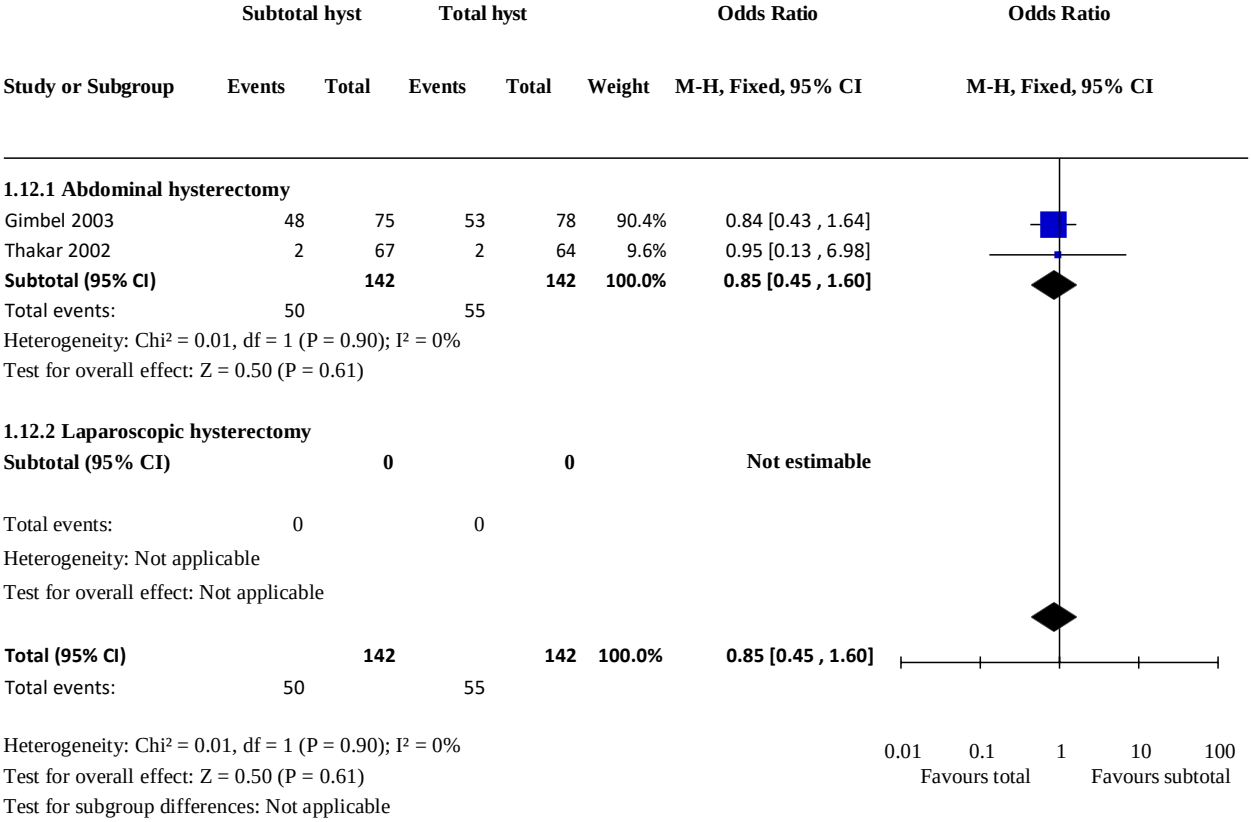


Total (95% CI)	**253**	**251**	**100.0%**	**1.19 [0.62 , 2.32]**	
Total events:	179	174			

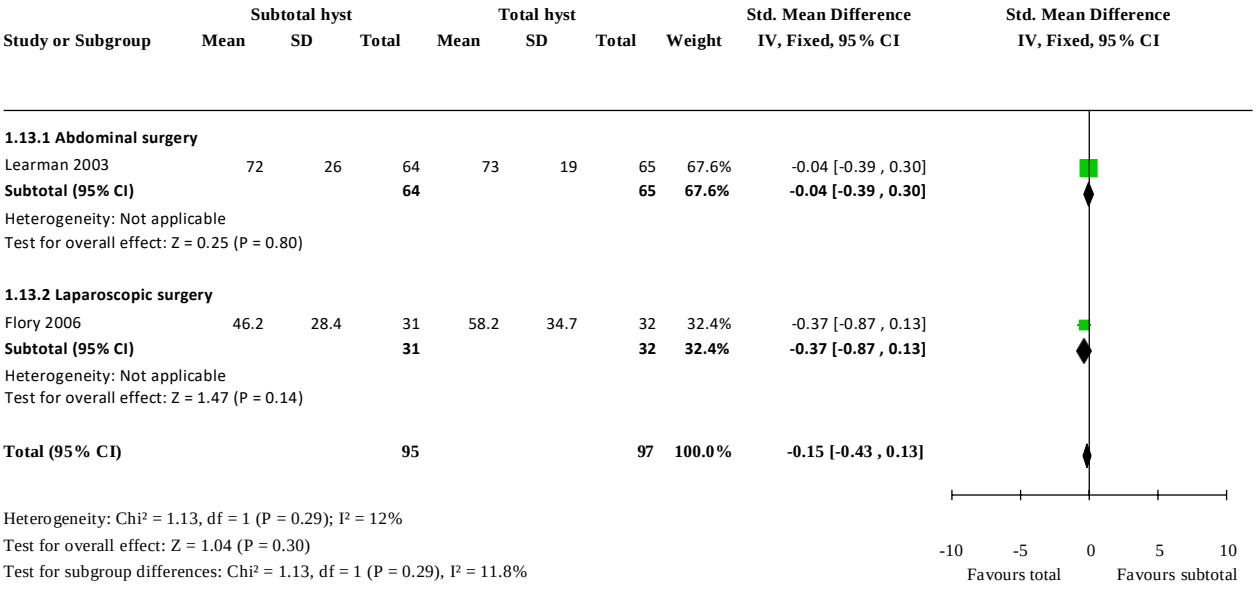
Heterogeneity: Tau² = 0.18; Chi² = 4.15, df = 2 (P = 0.13); I² = 52%
Test for overall effect: Z = 0.52 (P = 0.60)
Test for subgroup differences: Not applicable



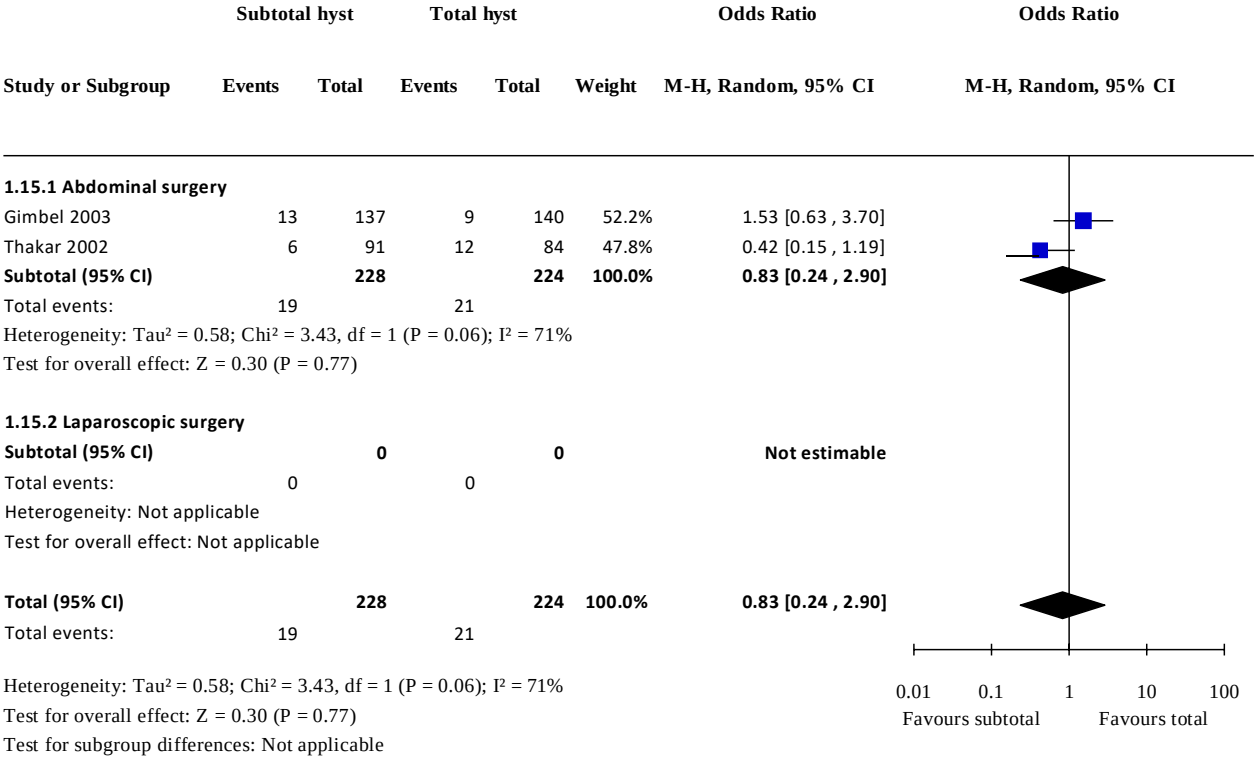
Analysis 1.12. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 12: Satisfaction with sex (dichotomous data) >2 years post surgery



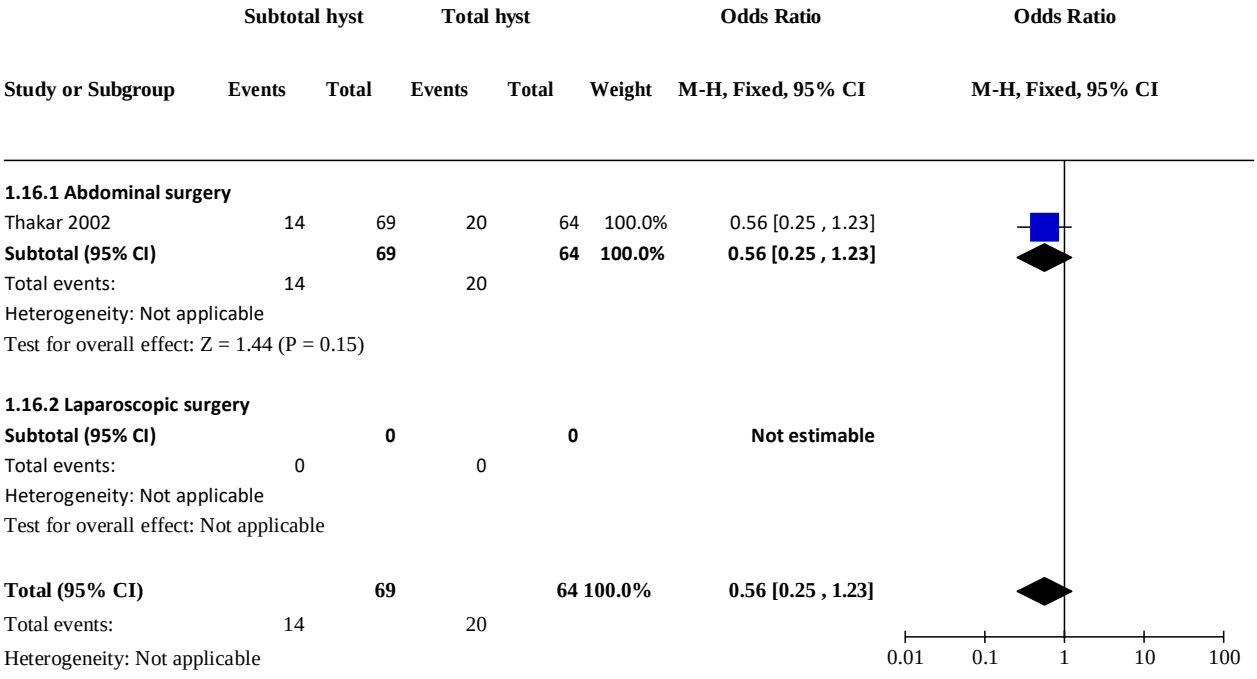
Analysis 1.13. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 13: Satisfaction with sex (continuous data) within 2 years post surgery



Analysis 1.15. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 15: Prevalence of dyspareunia within 2 years post surgery



Analysis 1.16. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 16: Prevalence of dyspareunia >2 years post surgery

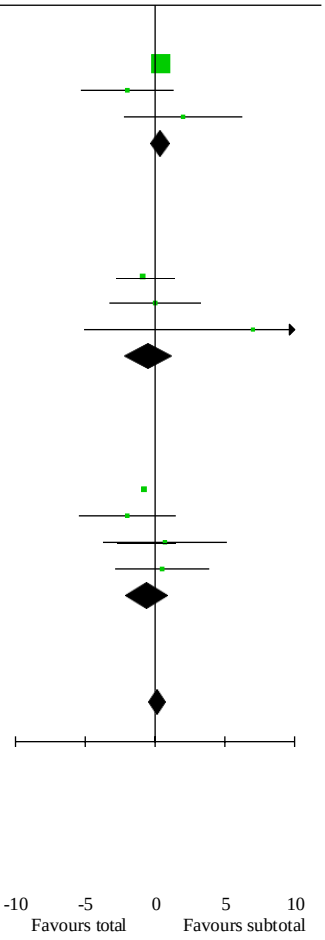


Test for overall effect: Z = 1.44 (P = 0.15) Favours subtotal Favours total

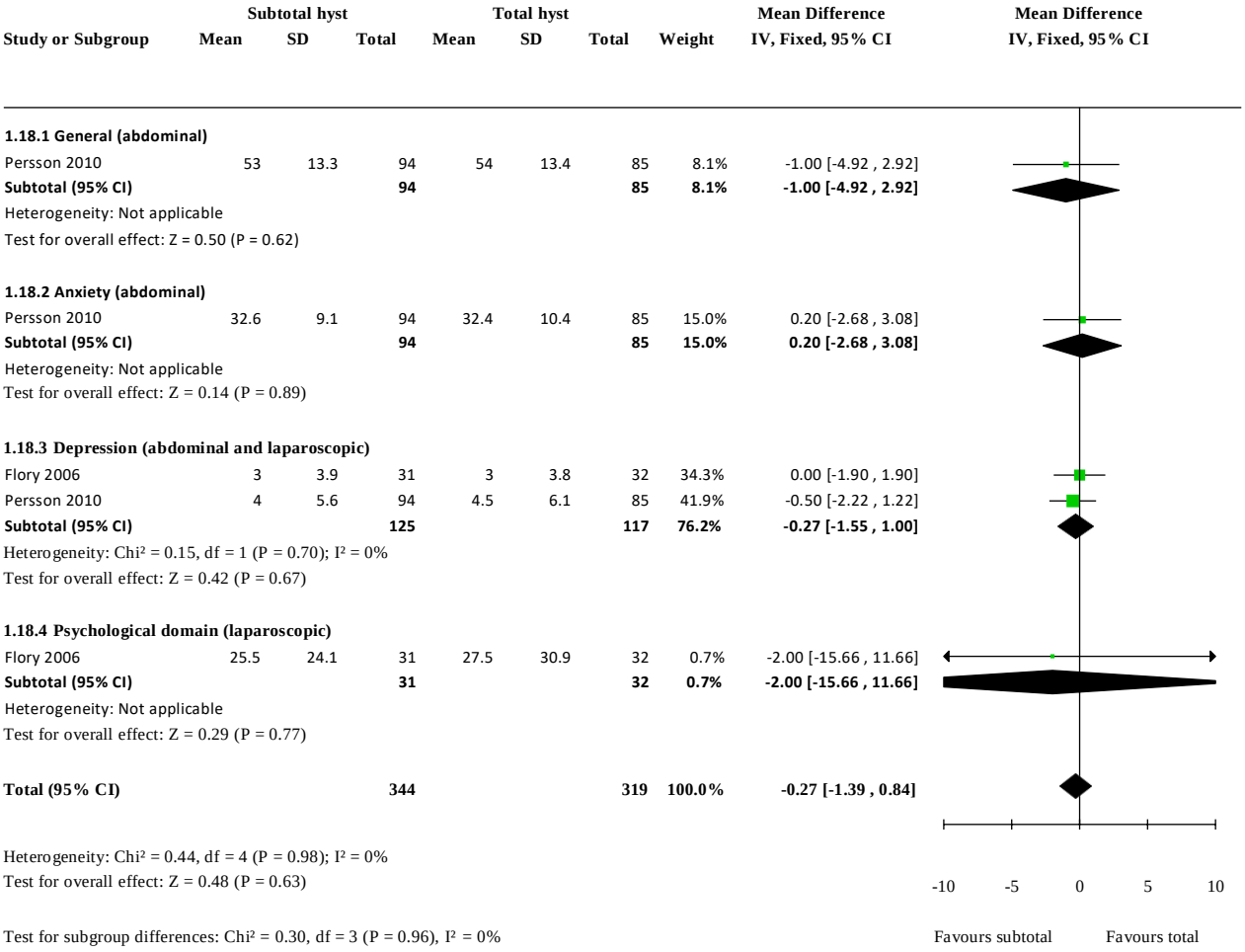
Test for subgroup differences: Not applicable

Analysis 1.17. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 17: Quality of life within 2 years post abdominal surgery (high better)

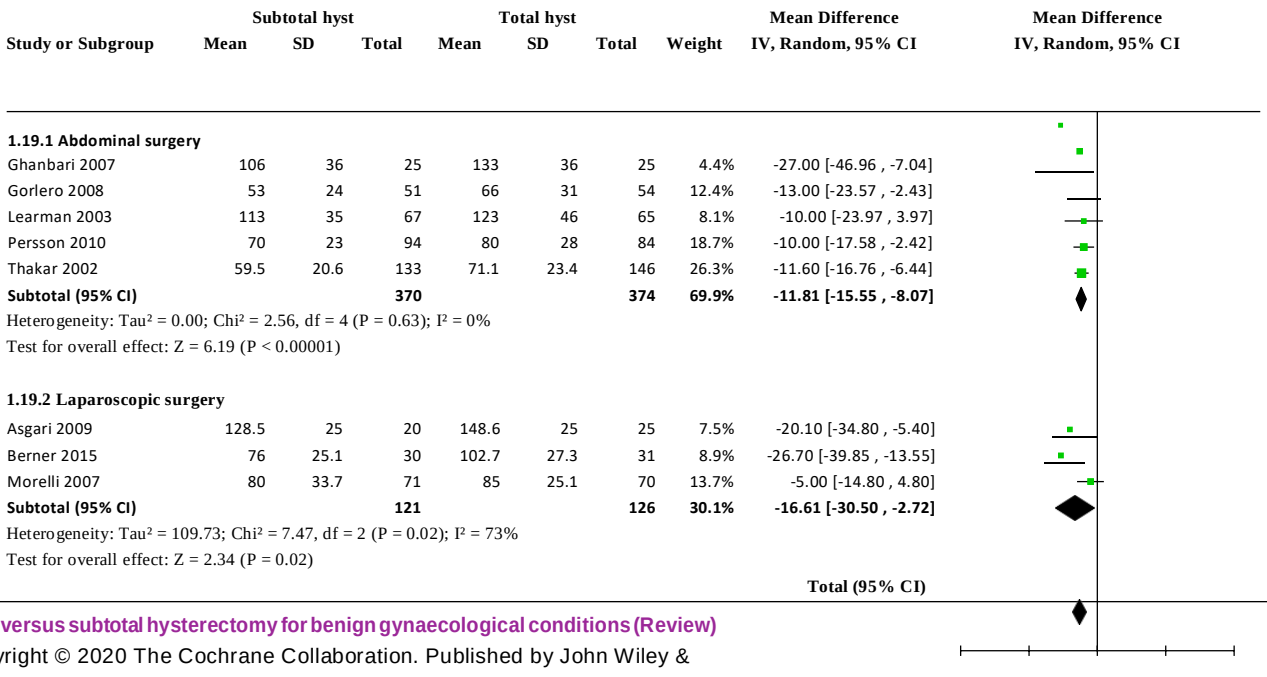
Study or Subgroup	Subtotal hyst Mean	SD	Total	Total hyst Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
1.17.1 General (abdominal)								
Ellstrom 2010	11.8	1.5	50	11.4	1.8	52	70.9%	0.40 [-0.24 , 1.04]
Learman 2003	85	11	64	87	8	65	2.6%	-2.00 [-5.32 , 1.32]
Thakar 2002	12	17	122	10	17	125	1.6%	2.00 [-2.24 , 6.24]
Subtotal (95% CI)			**236**			**242**	**75.2%**	**0.35 [-0.27 , 0.97]**
Heterogeneity: Chi² = 2.53, df = 2 (P = 0.28); I² = 21%								
Test for overall effect: Z = 1.10 (P = 0.27)								
1.17.2 Physical domain (abdominal)								
Gimbel 2003	52.9	8.8	136	53.8	7.7	140	7.7%	-0.90 [-2.85 , 1.05]
Learman 2003	47	10	64	47	9	65	2.7%	0.00 [-3.28 , 3.28]
Thakar 2002	28	47	122	21	50	125	0.2%	7.00 [-5.10 , 19.10]
Subtotal (95% CI)			**322**			**330**	**10.6%**	**-0.52 [-2.18 , 1.14]**
Heterogeneity: Chi² = 1.73, df = 2 (P = 0.42); I² = 0%								
Test for overall effect: Z = 0.61 (P = 0.54)								
1.17.3 Mental domain (abdominal)								
Gimbel 2003	53	8.7	136	53.8	7.7	140	7.8%	-0.80 [-2.74 , 1.14]
Learman 2003	49	11	64	51	9	65	2.4%	-2.00 [-5.47 , 1.47]
Persson 2010	105.7	14.1	94	105	16	85	1.5%	0.70 [-3.74 , 5.14]
Thakar 2002	3.4	14	122	2.9	13	125	2.6%	0.50 [-2.87 , 3.87]
Subtotal (95% CI)			**416**			**415**	**14.2%**	**-0.61 [-2.05 , 0.82]**
Heterogeneity: Chi² = 1.40, df = 3 (P = 0.70); I² = 0%								
Test for overall effect: Z = 0.84 (P = 0.40)								
Total (95% CI)			**974**			**987**	**100.0%**	**0.12 [-0.42 , 0.66]**
Heterogeneity: Chi² = 7.75, df = 9 (P = 0.56); I² = 0%								
Test for overall effect: Z = 0.44 (P = 0.66)								
Test for subgroup differences: Chi² = 2.10, df = 2 (P = 0.35), I² = 4.7%								



Analysis 1.18. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 18: Quality of life within 2 years post abdominal surgery (low better)



Analysis 1.19. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 19: Operating time (mins)



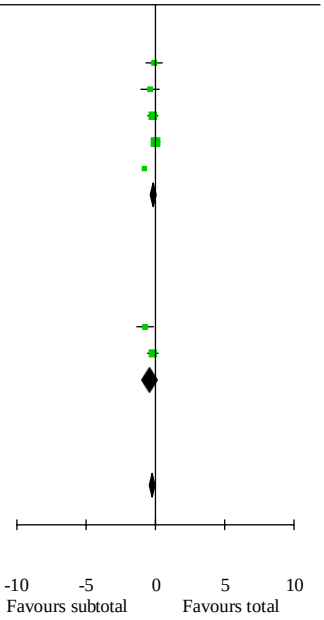
491	**500**	**100.0%**	**-13.11 [-17.56 , -8.66]**

Heterogeneity: Tau² = 12.66; Chi² = 10.44, df = 7 (P = 0.16); I² = 33%
Test for overall effect: Z = 5.77 (P < 0.00001)
Test for subgroup differences: Chi² = 0.43, df = 1 (P = 0.51), I² = 0%

Analysis 1.20. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 20: Length of hospital stay (days)

Study or Subgroup	Subtotal hyst Mean	SD	Total	Total hyst Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
1.20.1 Abdominal surgery								
Asnafi 2010	4.4	1.9	50	4.5	1.7	100	9.5%	-0.10 [-0.72 , 0.52]
Gorlero 2008	4.1	1.6	51	4.5	2	54	7.8%	-0.40 [-1.09 , 0.29]
Learman 2003	3.3	1.1	67	3.5	1.2	65	21.2%	-0.20 [-0.59 , 0.19]
Persson 2010	3.4	1.2	94	3.4	1.1	84	26.9%	0.00 [-0.34 , 0.34]
Thakar 2002	5.2	1.1	133	6	4.7	146	6.2%	-0.80 [-1.58 , -0.02]
Subtotal (95% CI)			**395**			**449**	**71.5%**	**-0.17 [-0.39 , 0.04]**
Heterogeneity: Tau² = 0.00; Chi² = 3.94, df = 4 (P = 0.41); I² = 0%								
Test for overall effect: Z = 1.56 (P = 0.12)								
1.20.2 Laparoscopic surgery								
Asgari 2009	2.85	0.59	20	3.6	1.47	25	9.2%	-0.75 [-1.38 , -0.12]
Morelli 2007	2.7	1.1	71	2.9	1.4	70	19.3%	-0.20 [-0.62 , 0.22]
Subtotal (95% CI)			**91**			**95**	**28.5%**	**-0.42 [-0.95 , 0.11]**
Heterogeneity: Tau² = 0.08; Chi² = 2.03, df = 1 (P = 0.15); I² = 51%								
Test for overall effect: Z = 1.56 (P = 0.12)								
Total (95% CI)			**486**			**544**	**100.0%**	**-0.24 [-0.44 , -0.04]**

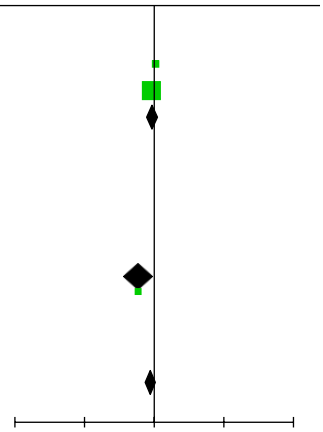
Heterogeneity: Tau² = 0.01; Chi² = 6.85, df = 6 (P = 0.34); I² = 12%
Test for overall effect: Z = 2.35 (P = 0.02)
Test for subgroup differences: Chi² = 0.74, df = 1 (P = 0.39), I² = 0%



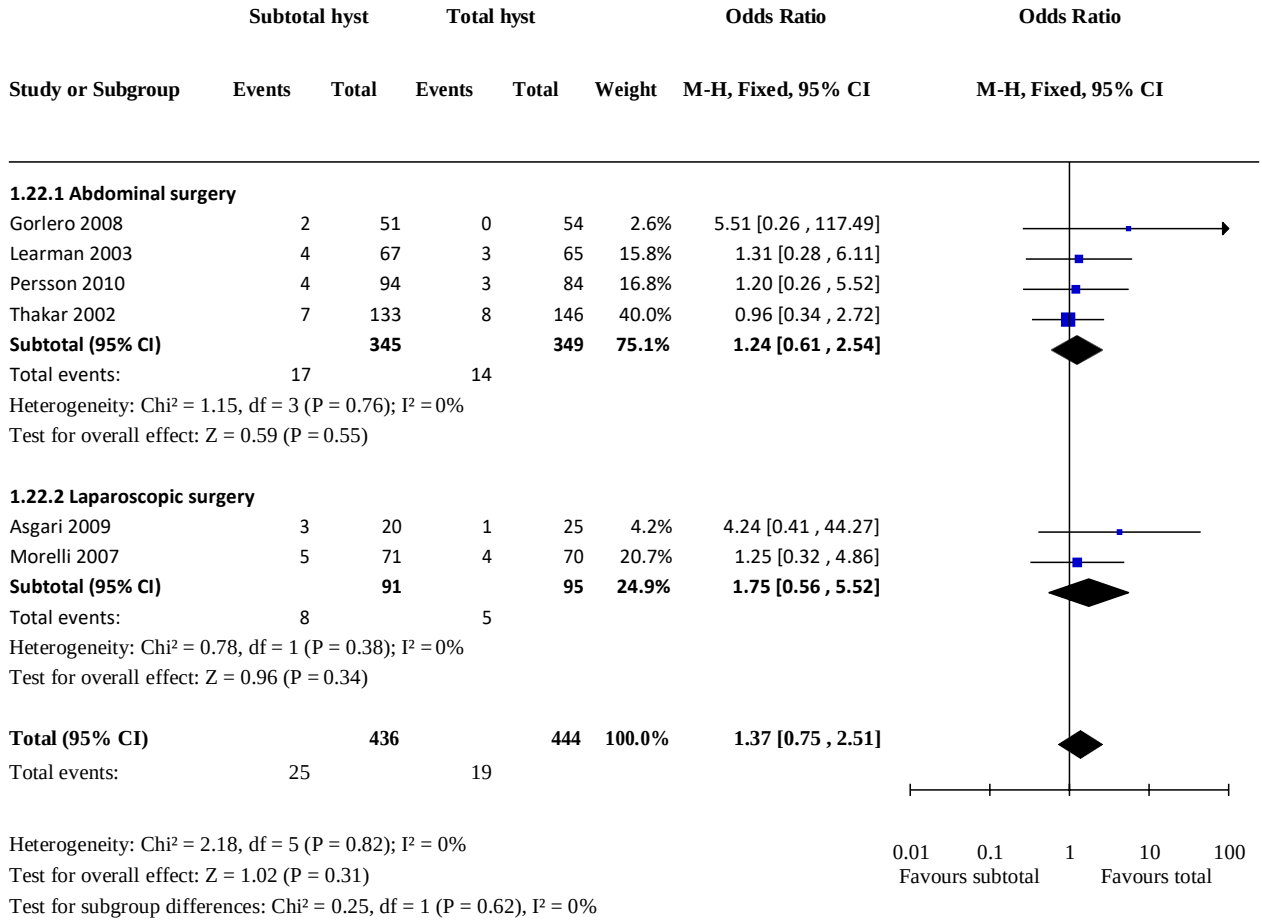
Analysis 1.21. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 21: Return to normal activities (weeks)

Study or Subgroup	Subtotal hysterectomy Mean	SD	Total	Total hysterectomy Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
1.21.1 Abdominal surgery								
Learman 2003	4.2	2.6	67	4.1	2.7	65	16.0%	0.10 [-0.80 , 1.00]
Persson 2010	4.6	1.3	94	4.8	1.6	84	70.5%	-0.20 [-0.63 , 0.23]
Subtotal (95% CI)			**161**			**149**	**86.5%**	**-0.14 [-0.53 , 0.25]**
Heterogeneity: Chi² = 0.34, df = 1 (P = 0.56); I² = 0%								
Test for overall effect: Z = 0.73 (P = 0.47)								

Test for subgroup differences: Chi² = 3.46, df = 1 (P = 0.06), I² = 71.1%

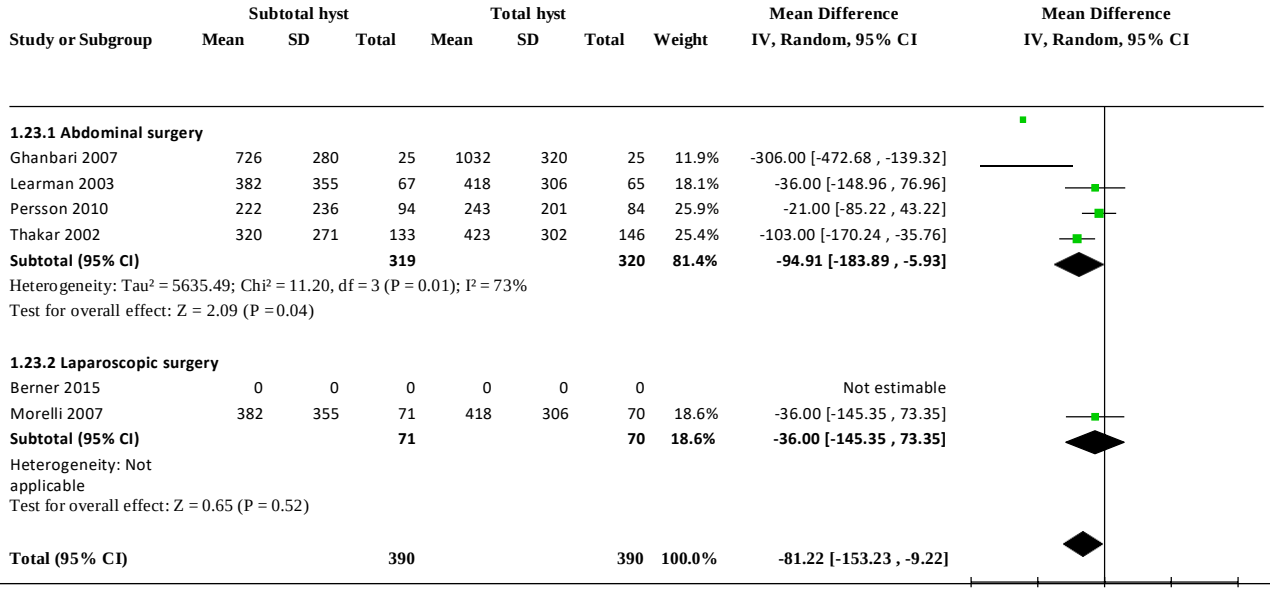


Analysis 1.22. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 22: Requirement for blood transfusion



Study or Subgroup	Subtotal hyst Events	Subtotal hyst Total	Total hyst Events	Total hyst Total	Weight	Odds Ratio M-H, Fixed, 95% CI
1.22.1 Abdominal surgery						
Gorlero 2008	2	51	0	54	2.6%	5.51 [0.26 , 117.49]
Learman 2003	4	67	3	65	15.8%	1.31 [0.28 , 6.11]
Persson 2010	4	94	3	84	16.8%	1.20 [0.26 , 5.52]
Thakar 2002	7	133	8	146	40.0%	0.96 [0.34 , 2.72]
Subtotal (95% CI)		**345**		**349**	**75.1%**	**1.24 [0.61 , 2.54]**
Total events:	17		14			
Heterogeneity: Chi² = 1.15, df = 3 (P = 0.76); I² = 0%						
Test for overall effect: Z = 0.59 (P = 0.55)						
1.22.2 Laparoscopic surgery						
Asgari 2009	3	20	1	25	4.2%	4.24 [0.41 , 44.27]
Morelli 2007	5	71	4	70	20.7%	1.25 [0.32 , 4.86]
Subtotal (95% CI)		**91**		**95**	**24.9%**	**1.75 [0.56 , 5.52]**
Total events:	8		5			
Heterogeneity: Chi² = 0.78, df = 1 (P = 0.38); I² = 0%						
Test for overall effect: Z = 0.96 (P = 0.34)						
Total (95% CI)		**436**		**444**	**100.0%**	**1.37 [0.75 , 2.51]**
Total events:	25		19			
Heterogeneity: Chi² = 2.18, df = 5 (P = 0.82); I² = 0%						
Test for overall effect: Z = 1.02 (P = 0.31)						
Test for subgroup differences: Chi² = 0.25, df = 1 (P = 0.62), I² = 0%						

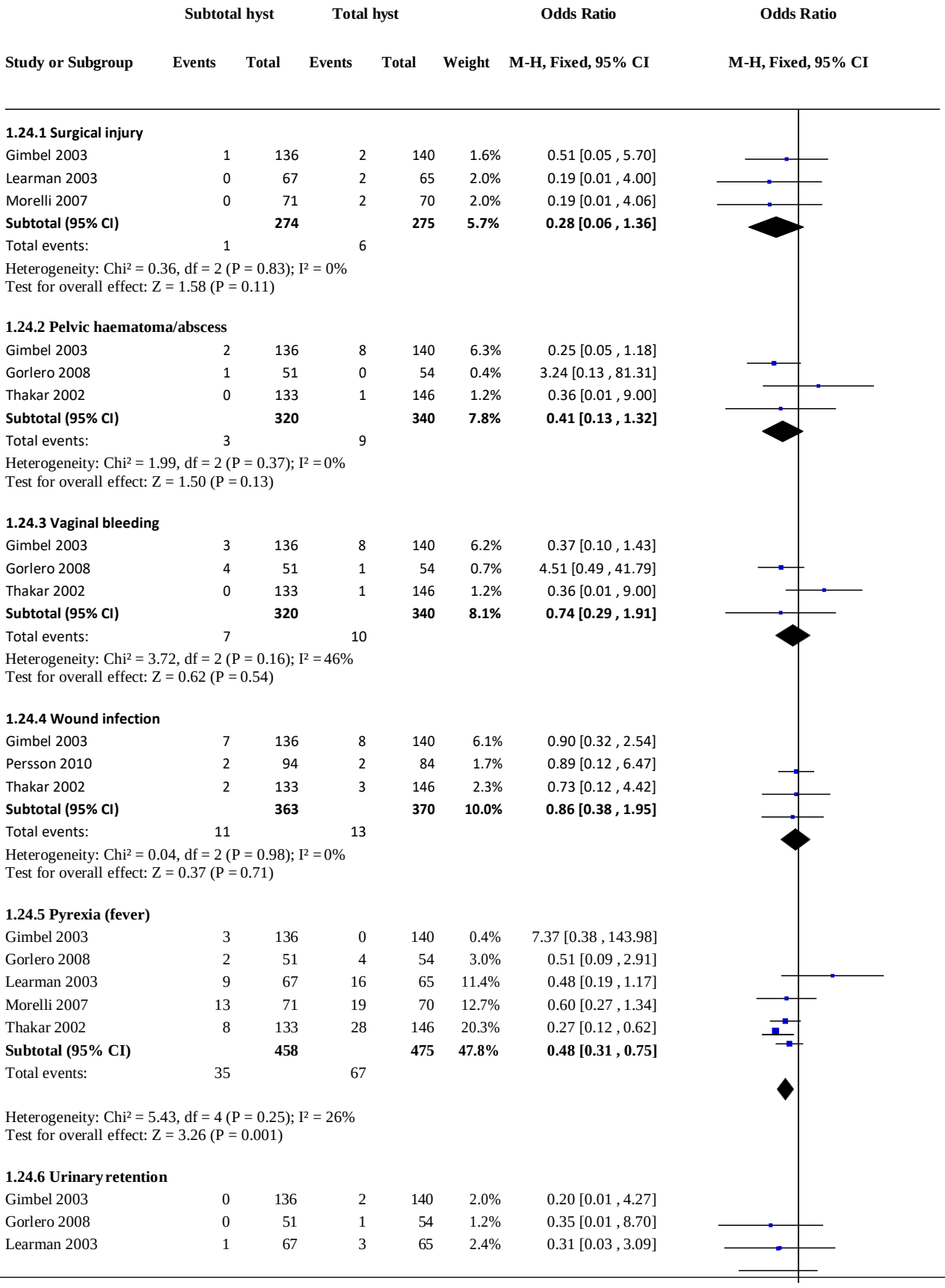
Analysis 1.23. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 23: Blood loss during surgery (mls)



Study or Subgroup	Subtotal hyst Mean	Subtotal hyst SD	Subtotal hyst Total	Total hyst Mean	Total hyst SD	Total hyst Total	Weight	Mean Difference IV, Random, 95% CI
1.23.1 Abdominal surgery								
Ghanbari 2007	726	280	25	1032	320	25	11.9%	-306.00 [-472.68 , -139.32]
Learman 2003	382	355	67	418	306	65	18.1%	-36.00 [-148.96 , 76.96]
Persson 2010	222	236	94	243	201	84	25.9%	-21.00 [-85.22 , 43.22]
Thakar 2002	320	271	133	423	302	146	25.4%	-103.00 [-170.24 , -35.76]
Subtotal (95% CI)			**319**			**320**	**81.4%**	**-94.91 [-183.89 , -5.93]**
Heterogeneity: Tau² = 5635.49; Chi² = 11.20, df = 3 (P = 0.01); I² = 73%								
Test for overall effect: Z = 2.09 (P = 0.04)								
1.23.2 Laparoscopic surgery								
Berner 2015	0	0	0	0	0	0		Not estimable
Morelli 2007	382	355	71	418	306	70	18.6%	-36.00 [-145.35 , 73.35]
Subtotal (95% CI)			**71**			**70**	**18.6%**	**-36.00 [-145.35 , 73.35]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.65 (P = 0.52)								
Total (95% CI)			**390**			**390**	**100.0%**	**-81.22 [-153.23 , -9.22]**

Heterogeneity: Tau² = 4129.53; Chi² = 11.57, df = 4 (P = 0.02); I² = 65%
Test for overall effect: Z = 2.21 (P = 0.03)
Test for subgroup differences: Chi² = 0.67, df = 1 (P = 0.41), I² = 0%

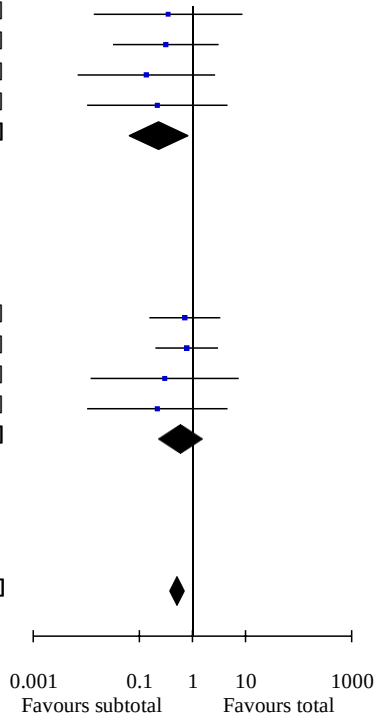
Analysis 1.24. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 24: Short term complications (predischarge)



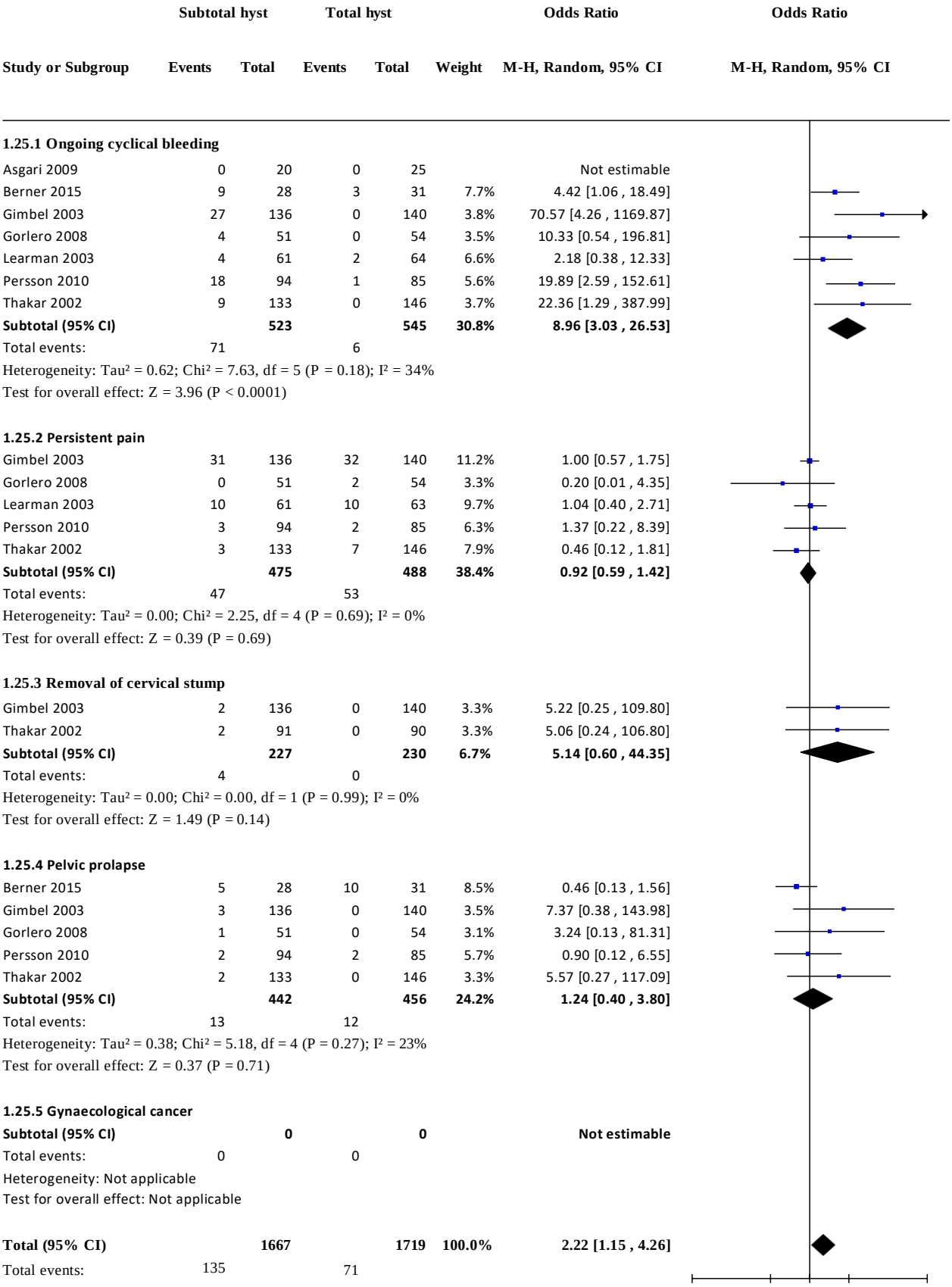
Study or Subgroup	Subtotal hyst Events	Subtotal hyst Total	Total hyst Events	Total hyst Total	Weight	Odds Ratio M-H, Fixed, 95% CI
1.24.1 Surgical injury						
Gimbel 2003	1	136	2	140	1.6%	0.51 [0.05 , 5.70]
Learman 2003	0	67	2	65	2.0%	0.19 [0.01 , 4.00]
Morelli 2007	0	71	2	70	2.0%	0.19 [0.01 , 4.06]
Subtotal (95% CI)		**274**		**275**	**5.7%**	**0.28 [0.06 , 1.36]**
Total events:	1		6			
Heterogeneity: Chi² = 0.36, df = 2 (P = 0.83); I² = 0%						
Test for overall effect: Z = 1.58 (P = 0.11)						
1.24.2 Pelvic haematoma/abscess						
Gimbel 2003	2	136	8	140	6.3%	0.25 [0.05 , 1.18]
Gorlero 2008	1	51	0	54	0.4%	3.24 [0.13 , 81.31]
Thakar 2002	0	133	1	146	1.2%	0.36 [0.01 , 9.00]
Subtotal (95% CI)		**320**		**340**	**7.8%**	**0.41 [0.13 , 1.32]**
Total events:	3		9			
Heterogeneity: Chi² = 1.99, df = 2 (P = 0.37); I² = 0%						
Test for overall effect: Z = 1.50 (P = 0.13)						
1.24.3 Vaginal bleeding						
Gimbel 2003	3	136	8	140	6.2%	0.37 [0.10 , 1.43]
Gorlero 2008	4	51	1	54	0.7%	4.51 [0.49 , 41.79]
Thakar 2002	0	133	1	146	1.2%	0.36 [0.01 , 9.00]
Subtotal (95% CI)		**320**		**340**	**8.1%**	**0.74 [0.29 , 1.91]**
Total events:	7		10			
Heterogeneity: Chi² = 3.72, df = 2 (P = 0.16); I² = 46%						
Test for overall effect: Z = 0.62 (P = 0.54)						
1.24.4 Wound infection						
Gimbel 2003	7	136	8	140	6.1%	0.90 [0.32 , 2.54]
Persson 2010	2	94	2	84	1.7%	0.89 [0.12 , 6.47]
Thakar 2002	2	133	3	146	2.3%	0.73 [0.12 , 4.42]
Subtotal (95% CI)		**363**		**370**	**10.0%**	**0.86 [0.38 , 1.95]**
Total events:	11		13			
Heterogeneity: Chi² = 0.04, df = 2 (P = 0.98); I² = 0%						
Test for overall effect: Z = 0.37 (P = 0.71)						
1.24.5 Pyrexia (fever)						
Gimbel 2003	3	136	0	140	0.4%	7.37 [0.38 , 143.98]
Gorlero 2008	2	51	4	54	3.0%	0.51 [0.09 , 2.91]
Learman 2003	9	67	16	65	11.4%	0.48 [0.19 , 1.17]
Morelli 2007	13	71	19	70	12.7%	0.60 [0.27 , 1.34]
Thakar 2002	8	133	28	146	20.3%	0.27 [0.12 , 0.62]
Subtotal (95% CI)		**458**		**475**	**47.8%**	**0.48 [0.31 , 0.75]**
Total events:	35		67			
Heterogeneity: Chi² = 5.43, df = 4 (P = 0.25); I² = 26%						
Test for overall effect: Z = 3.26 (P = 0.001)						
1.24.6 Urinary retention						
Gimbel 2003	0	136	2	140	2.0%	0.20 [0.01 , 4.27]
Gorlero 2008	0	51	1	54	1.2%	0.35 [0.01 , 8.70]
Learman 2003	1	67	3	65	2.4%	0.31 [0.03 , 3.09]

Analysis 1.24. (Continued)

Gorlero 2008	0	51	1	54	1.2%	0.35 [0.01 , 8.70]
Learman 2003	1	67	3	65	2.4%	0.31 [0.03 , 3.09]
Morelli 2007	0	71	3	70	2.8%	0.13 [0.01 , 2.66]
Thakar 2002	0	133	2	146	1.9%	0.22 [0.01 , 4.55]
Subtotal (95% CI)		**458**		**475**	**10.4%**	**0.23 [0.06 , 0.81]**
Total events:	1		11			
Heterogeneity: Chi² = 0.26, df = 4 (P = 0.99); I² = 0%						
Test for overall effect: Z = 2.29 (P = 0.02)						
1.24.7 Bowel obstruction/ileus						
Learman 2003	3	67	4	65	3.1%	0.71 [0.15 , 3.33]
Morelli 2007	4	71	5	70	3.9%	0.78 [0.20 , 3.02]
Persson 2010	0	94	1	85	1.3%	0.30 [0.01 , 7.42]
Thakar 2002	0	133	2	146	1.9%	0.22 [0.01 , 4.55]
Subtotal (95% CI)		**365**		**366**	**10.2%**	**0.59 [0.24 , 1.46]**
Total events:	7		12			
Heterogeneity: Chi² = 0.80, df = 3 (P = 0.85); I² = 0%						
Test for overall effect: Z = 1.14 (P = 0.26)						
Total (95% CI)		**2558**		**2641**	**100.0%**	**0.51 [0.38 , 0.69]**
Total events:	65		128			
Heterogeneity: Chi² = 16.64, df = 25 (P = 0.89); I² = 0%						
Test for overall effect: Z = 4.40 (P < 0.0001)						
Test for subgroup differences: Chi² = 4.53, df = 6 (P = 0.61), I² = 0%						

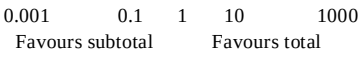


Analysis 1.25. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 25: Intermediate term complications (aMer discharge and within 2 years post surgery)



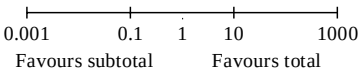
Study or Subgroup	Subtotal hyst Events	Total	Total hyst Events	Total	Weight	Odds Ratio M-H, Random, 95% CI
1.25.1 Ongoing cyclical bleeding						
Asgari 2009	0	20	0	25		Not estimable
Berner 2015	9	28	3	31	7.7%	4.42 [1.06 , 18.49]
Gimbel 2003	27	136	0	140	3.8%	70.57 [4.26 , 1169.87]
Gorlero 2008	4	51	0	54	3.5%	10.33 [0.54 , 196.81]
Learman 2003	4	61	2	64	6.6%	2.18 [0.38 , 12.33]
Persson 2010	18	94	1	85	5.6%	19.89 [2.59 , 152.61]
Thakar 2002	9	133	0	146	3.7%	22.36 [1.29 , 387.99]
Subtotal (95% CI)		**523**		**545**	**30.8%**	**8.96 [3.03 , 26.53]**
Total events:	71		6			
Heterogeneity: Tau² = 0.62; Chi² = 7.63, df = 5 (P = 0.18); I² = 34%						
Test for overall effect: Z = 3.96 (P < 0.0001)						
1.25.2 Persistent pain						
Gimbel 2003	31	136	32	140	11.2%	1.00 [0.57 , 1.75]
Gorlero 2008	0	51	2	54	3.3%	0.20 [0.01 , 4.35]
Learman 2003	10	61	10	63	9.7%	1.04 [0.40 , 2.71]
Persson 2010	3	94	2	85	6.3%	1.37 [0.22 , 8.39]
Thakar 2002	3	133	7	146	7.9%	0.46 [0.12 , 1.81]
Subtotal (95% CI)		**475**		**488**	**38.4%**	**0.92 [0.59 , 1.42]**
Total events:	47		53			
Heterogeneity: Tau² = 0.00; Chi² = 2.25, df = 4 (P = 0.69); I² = 0%						
Test for overall effect: Z = 0.39 (P = 0.69)						
1.25.3 Removal of cervical stump						
Gimbel 2003	2	136	0	140	3.3%	5.22 [0.25 , 109.80]
Thakar 2002	2	91	0	90	3.3%	5.06 [0.24 , 106.80]
Subtotal (95% CI)		**227**		**230**	**6.7%**	**5.14 [0.60 , 44.35]**
Total events:	4		0			
Heterogeneity: Tau² = 0.00; Chi² = 0.00, df = 1 (P = 0.99); I² = 0%						
Test for overall effect: Z = 1.49 (P = 0.14)						
1.25.4 Pelvic prolapse						
Berner 2015	5	28	10	31	8.5%	0.46 [0.13 , 1.56]
Gimbel 2003	3	136	0	140	3.5%	7.37 [0.38 , 143.98]
Gorlero 2008	1	51	0	54	3.1%	3.24 [0.13 , 81.31]
Persson 2010	2	94	2	85	5.7%	0.90 [0.12 , 6.55]
Thakar 2002	2	133	0	146	3.3%	5.57 [0.27 , 117.09]
Subtotal (95% CI)		**442**		**456**	**24.2%**	**1.24 [0.40 , 3.80]**
Total events:	13		12			
Heterogeneity: Tau² = 0.38; Chi² = 5.18, df = 4 (P = 0.27); I² = 23%						
Test for overall effect: Z = 0.37 (P = 0.71)						
1.25.5 Gynaecological cancer						
Subtotal (95% CI)		**0**		**0**		**Not estimable**
Total events:	0		0			
Heterogeneity: Not applicable						
Test for overall effect: Not applicable						
Total (95% CI)		**1667**		**1719**	**100.0%**	**2.22 [1.15 , 4.26]**
Total events:	135		71			

Heterogeneity: Tau² = 0.91; Chi² = 39.83, df = 17 (P = 0.001); I² = 57%
Test for overall effect: Z = 2.38 (P = 0.02)



Analysis 1.25. (Continued)

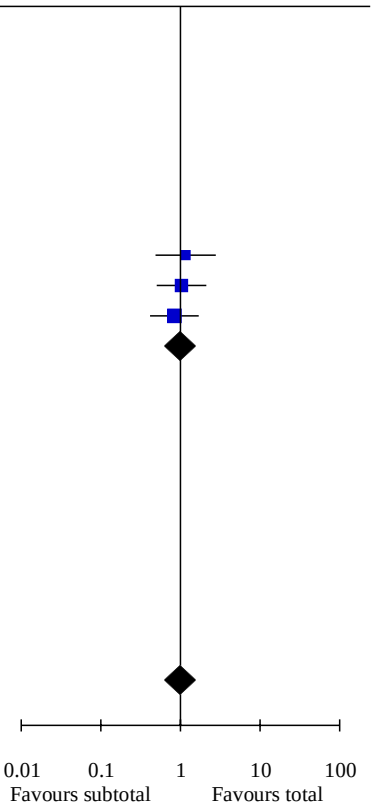
Heterogeneity: Tau² = 0.91; Chi² = 39.83, df = 17 (P = 0.001); I² = 57%
Test for overall effect: Z = 2.38 (P = 0.02)
Test for subgroup differences: Chi² = 16.18, df = 3 (P = 0.001), I² = 81.5%



Analysis 1.26. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 26: Long term complications (>2 years post surgery)

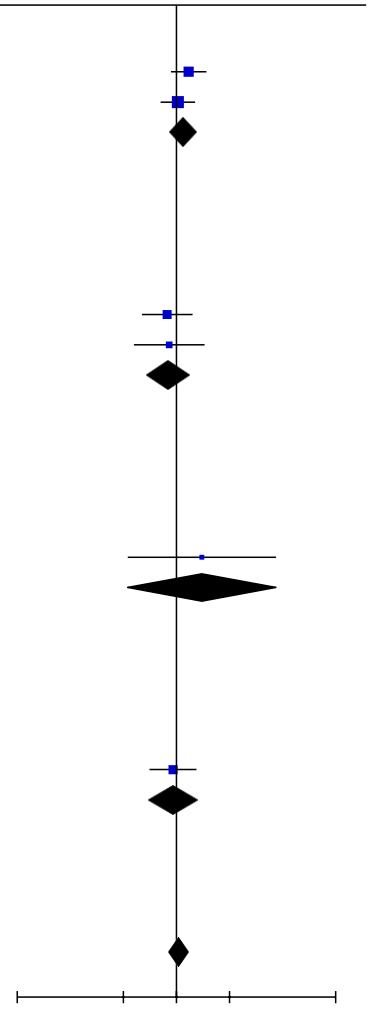
Study or Subgroup	Subtotal hyst Events	Subtotal hyst Total	Total hyst Events	Total hyst Total	Weight	Odds Ratio M-H, Fixed, 95% CI
1.26.1 Fistula						
Subtotal (95% CI)		**0**		**0**		**Not estimable**
Total events:	0		0			
Heterogeneity: Not applicable						
Test for overall effect: Not applicable						
1.26.2 Pelvic prolapse						
Gimbel 2003	12	93	11	97	22.8%	1.16 [0.48 , 2.77]
Persson 2010	27	70	22	58	36.0%	1.03 [0.50 , 2.10]
Thakar 2002	36	65	37	62	41.2%	0.84 [0.41 , 1.70]
Subtotal (95% CI)		**228**		**217**	**100.0%**	**0.98 [0.63 , 1.51]**
Total events:	75		70			
Heterogeneity: Chi² = 0.34, df = 2 (P = 0.84); I² = 0%						
Test for overall effect: Z = 0.09 (P = 0.93)						
1.26.3 Gynaecological cancer						
Subtotal (95% CI)		**0**		**0**		**Not estimable**
Total events:	0		0			
Heterogeneity: Not applicable						
Test for overall effect: Not applicable						
Total (95% CI)		**228**		**217**	**100.0%**	**0.98 [0.63 , 1.51]**
Total events:	75		70			

Heterogeneity: Chi² = 0.34, df = 2 (P = 0.84); I² = 0%
Test for overall effect: Z = 0.09 (P = 0.93)
Test for subgroup differences: Not applicable



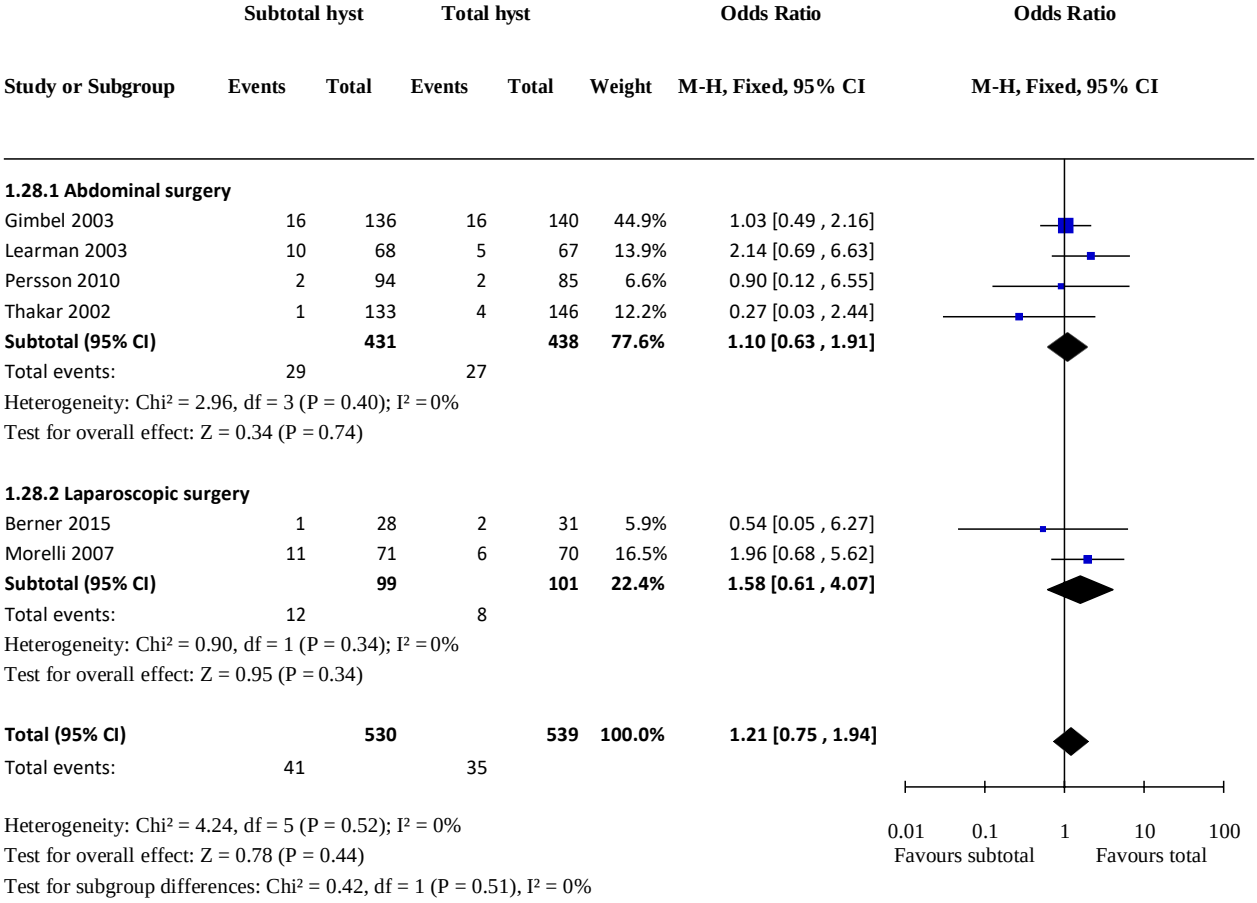
Analysis 1.27. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 27: Alleviation of pre-surgery symptoms

Study or Subgroup	Subtotal hyst Events	Subtotal hyst Total	Total hyst Events	Total hyst Total	Weight	Odds Ratio M-H, Fixed, 95% CI
1.27.1 Back pain						
Learman 2003	22	61	16	64	22.9%	1.69 [0.78 , 3.66]
Morelli 2007	19	71	18	70	30.5%	1.06 [0.50 , 2.24]
Subtotal (95% CI)		**132**		**134**	**53.4%**	**1.33 [0.78 , 2.27]**
Total events:	41		34			
Heterogeneity: Chi² = 0.74, df = 1 (P = 0.39); I² = 0%						
Test for overall effect: Z = 1.04 (P = 0.30)						
1.27.2 Pelvic pressure						
Learman 2003	6	61	9	64	18.2%	0.67 [0.22 , 2.00]
Morelli 2007	3	71	4	70	8.9%	0.73 [0.16 , 3.38]
Subtotal (95% CI)		**132**		**134**	**27.0%**	**0.69 [0.28 , 1.68]**
Total events:	9		13			
Heterogeneity: Chi² = 0.01, df = 1 (P = 0.93); I² = 0%						
Test for overall effect: Z = 0.82 (P = 0.41)						
1.27.3 Menstrual abnormalities						
Morelli 2007	1	71	0	70	1.1%	3.00 [0.12 , 74.90]
Subtotal (95% CI)		**71**		**70**	**1.1%**	**3.00 [0.12 , 74.90]**
Total events:	1		0			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.67 (P = 0.50)						
1.27.4 Pelvic pain						
Morelli 2007	8	71	9	70	18.5%	0.86 [0.31 , 2.38]
Subtotal (95% CI)		**71**		**70**	**18.5%**	**0.86 [0.31 , 2.38]**
Total events:	8		9			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.29 (P = 0.77)						
Total (95% CI)		**406**		**408**	**100.0%**	**1.09 [0.72 , 1.64]**
Total events:	59		56			



Heterogeneity: Chi² = 2.88, df = 5 (P = 0.72); I² = 0%
Test for overall effect: Z = 0.40 (P = 0.69)
Test for subgroup differences: Chi² = 2.14, df = 3 (P = 0.54), I² = 0%

Analysis 1.28. Comparison 1: Subtotal hysterectomy versus total hysterectomy, Outcome 28: Readmission rate (related to surgery)



APPENDICES

Appendix 1. Search strategies

CENTRAL I

1 exp Hysterectomy/ (1315)
2 hysterectom$.tw. (2040)
3 or/1-2 (2256)
4 cerv$.tw. (6692)
5 uter$.tw. (3845)
6 total$.tw. (81361)
7 sub$total$.tw. (346)
8 (cerv$ adj5 conserv$).tw. (37)
9 supracerv$.tw. (19)
10 or/4-9 (89754)
11 3 and 10 (1059)
12 limit 11 to yr="2008 -Current" (160)

MDSG

Keywords CONTAINS "Hysterectomy" or Title CONTAINS "Hysterectomy" AND Keywords CONTAINS "Hysterectomy, subtotal" or "subtotal" or "total abdominal hysterectomy" or "total addominal hysterectomy" or "total hysterectomy" or "total laparoscopic hysterectomy" or "supravaginal hysterectomy" or "supracervical hysterectomy" or "Hysterectomy, Vaginal" or "hysterectomy techniques" or Title CONTAINS "Hysterectomy, subtotal" or "subtotal" or "total abdominal hysterectomy" or "total addominal hysterectomy" or "total hysterectomy"

or "total laparoscopic hysterectomy" or "supravaginal hysterectomy" or "supracervical hysterectomy" or "Hysterectomy, Vaginal" or "hysterectomy techniques"

MEDLINE

1 exp Hysterectomy/ (21954)
2 hysterectom$.tw. (22723)
3 or/1-2 (32374)
4 cerv$.tw.(167335)
5 uter$.tw. (132705)
6 total$.tw. (1111625)
7 sub$total$.tw. (14062)
8 (cerv$ adj5 conserv$).tw. (524)
9 supracerv$.tw. (304)
10 or/4-9 (1373177)
11 3 and 10(17190)
12 randomized controlled trial.pt. (310410)
13 controlled clinical trial.pt. (82747)
14 randomized.ab. (225974)
15 placebo.tw. (133438)
16 clinical trials as topic.sh. (155008)
17 randomly.ab. (166255)
18 trial.ti. (96498)
19 (crossover or cross-over or cross over).tw. (51126)
20 or/12-19 (758822)
21 exp animals/ not humans.sh. (3606366)
22 20 not 21 (700755)
23 11 and 22 (1285)
24 (200810$ or 200811$ or 200812$).ed. (206356)
25 (2009$ or 2010$ or 2011$).ed. (2319706)
26 24 or 25 (2526062)
27 23 and 26 (208)

EMBASE

1 exp Hysterectomy/ (35185)
2 hysterectom$.tw. (26174)
3 or/1-2 (41466)
4 total$.tw. (1257287)
5 complete.tw. (466910)
6 4 or 5 (1664702)
7 3 and 6 (8546)
8 sub$total.tw. (14362)
9 supra$cervi$.tw. (391)
10 partial$.tw. (455064)
11 8 or 9 or 10 (468092)
12 7 and 11 (926)
13 Clinical Trial/ (810309)
14 Randomized Controlled Trial/ (281916)
15 exp randomization/ (53159)
16 Single Blind Procedure/ (13675)
17 Double Blind Procedure/ (99014)
18 Crossover Procedure/ (29973)
19 Placebo/ (180293)
20 Randomi?ed controlled trial$.tw. (61040)
21 Rct.tw. (7053)
22 random allocation.tw. (1025)
23 randomly allocated.tw. (15048)
24 allocated randomly.tw. (1674)
25 (allocated adj2 random).tw. (682)
26 Single blind$.tw. (10777)
27 Double blind$.tw. (115701)
28 ((treble or triple) adj blind$).tw.
(237) 29 placebo$.tw. (155788)
30 prospective study/ (164952)
31 or/13-30 (1118924)

32 case study/ (12385)
33 case report.tw. (201855)
34 abstract report/ or letter/ (782469)
35 or/32-34 (992855)
36 31 not 35 (1086028)
37 12 and 36 (146)
38 (2010$ or 2011$).em. (1754807)
39 37 and 38 (22)

CINAHL

1 exp Hysterectomy/ (1556)
2 hysterectom$.tw. (1391)
3 or/1-2 (1989)
4 cerv$.tw. (9275)
5 uter$.tw. (3266)
6 total$.tw. (57757)
7 sub$total$.tw. (192)
8 (cerv$ adj5 conserv$).tw. (35)
9 supracerv$.tw. (26)
10 or/4-9 (69151)
11 3 and 10 (653)
12 limit 11 to yr="2005 - 2008" (349)
13 exp clinical trials/ (66624)
14 Clinical trial.pt. (35279)
15 (clinic$ adj trial$1).tw. (15159)
16 ((singl$ or doubl$ or trebl$ or tripl$) adj (blind$3 or mask$3)).tw.
(8936) 17 Randomi?ed control$ trial$.tw. (12888)
18 Random assignment/ (19554)
19 Random$ allocat$.tw. (1364)
20 Placebo$.tw. (12335)
21 Placebos/ (4737)
22 Quantitative studies/ (4303)
23 Allocat$ random$.tw. (78)
24 or/13-23 (91550)
25 24 and 12 (53)
26 from 25 keep 1-53 (53)

PsycINFO

1 exp Hysterectomy/ (347)
2 hysterectom$.tw. (594)
3 1 or 2 (614)
4 total$.tw. (121233)
5 complete.tw. (46339)
6 4 or 5 (164343)
7 3 and 6 (74)
8 sub$total.tw. (156)
9 supra$cervi$.tw. (2)
10 partial$.tw. (48278)
11 8 or 9 or 10 (48425)
12 7 and 11 (10)

W H A T ' S N E W

Date	Event	Description
9 February 2020	New search has been performed	For the 2020 update, nine trials were included at the review but most of then were longer follow-ups of trials already included at the review, adding data of 5 to 14 years of follow up. Moreover, we have included the quality of evidence using GRADE criteria.

Date	Event	Description
6 December 2011	New citation required but conclusions have not changed	The addition of 6 studies has not led to a change in our conclusions.
6 December 2011	New search has been performed	Six more RCTs identified and added in the 2011 update. Primary outcome list has been restructured to include bowel and sexual activities. This is to reflect the fact that more recent studies report additional outcomes. The number of primary outcomes has been reduced and comparisons structured to assess outcomes within 2 years post-surgery and greater than 2 years post-surgery, rather than at multiple time points, to simplify the comparisons.

HISTORY

Protocol first published: Issue 4, 2004
Review first published: Issue 2, 2006

Date	Event	Description
6 November 2008	Amended	Converted to new review format.
3 February 2006	New citation required and conclusions have changed	Substantive amendment

CONTRIBUTIONS OF AUTHORS

Valeria Ivanova devised the idea for the review and wrote the protocol after discussion with Professor Cindy Farquhar. She selected trials for inclusion and extracted data.

Anne Lethaby commented on the protocol and finalised the protocol after peer review. She performed searches for trials, selected trials for inclusion, extracted and entered data, assessed all studies for risk of bias and wrote the remaining sections of the review. She also led the 2011 update of the review.

Asima Mukhopadhyay selected trials for inclusion, extracted data and assessed studies for risk of bias and commented on the text of the review for the 2011 update. She also provided clinical input and wrote the discussion.

Raj Naik provided clinical input during the selection of primary and secondary outcomes for the 2011 update and also commented on the text of the review.

Neil Johnson commented on the text of the original publication of the review.

Marcelo Faber and Luiz Brito have updated the 2020 review version, and have performed data selection and extraction, assessed all studies for risk of bias, added the analysis of the quality of evidence and also commented on the text of the review. Anne Lethaby and Raj Naik have revised the manuscript.

DECLARATIONS OF INTEREST

None known

SOURCES OF SUPPORT

Internal sources

- Department of Obstetrics and Gynaecology, University of Auckland, New Zealand

External sources

- No sources of support supplied

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

For the 2011 update, as a result of peer review, the list of outcomes was simplified and analysed according to only two periods of follow up: within two years and greater than two years. For the 2020 update, new data for long-term studies were added to the previous studies.

5. DISCUSSÃO GERAL

Nossos resultados avaliaram o comportamento clínico das pacientes submetidas a HT e HST no curto prazo, até 2 anos pós cirurgia, e no longo prazo, após 2 anos de cirurgia. Os dados obtidos após a inclusão dos novos estudos à análise dos trabalhos já avaliados nas primeiras revisões trouxeram alguns achados novos esperados, achados que corroboraram dados previamente obtidos e alguns achados surpreendentes até então sobre os acontecimentos clínicos pós HT ou HST.

O tempo cirúrgico menor nas cirurgias realizadas por via laparoscópica tanto na HT quanto na HST demonstra que a curva de aprendizado crescente nos países desenvolvidos reduziu o tempo cirúrgico e passou a se equiparar com a cirurgia aberta (14, 26-28), mostrando o potencial benefício desta técnica em reduzir o tempo de exposição das pacientes ao trauma cirúrgico e poupá-las da abertura da parede e da cavidade abdominal, o que acrescenta maiores riscos de complicações da ferida operatória como deiscência, infecções e hérnias. Na contramão desta diminuição de riscos, encontramos um complicador para a realização de cirurgia via laparoscópica que é inerente a técnica: a realização do pneumoperitônio, o que obriga o procedimento a ser realizado com anestesia geral com intubação orotraqueal para garantir a ventilação da paciente frente a maior pressão encontrada no abdome. Tal obrigatoriedade de anestesia geral não acontece nas vias abdominal e vaginal, podendo o médico anestesiologista escolher, de forma individualizada, a melhor técnica anestésica para cada paciente.

A HST apresentou menor risco para a ocorrência de febre no pós-operatório imediato. Tal achado também corrobora o esperado para tal técnica em comparação com a HT uma vez que a HST, anatomicamente, poupa a paciente da exposição da cavidade

abdominal ao conteúdo vaginal, pois a cúpula vaginal não é aberta para a remoção do colo. Tal contato da cavidade abdominal com o conteúdo vaginal explicaria de forma isolada a ocorrência de maior frequência de febre no pós-operatório imediato da HT uma vez que esse conteúdo vaginal é sabidamente composto por uma microbiota específica do canal vaginal e causaria uma resposta inflamatória e imunológica ao cair no ambiente estéril da cavidade abdominal (29, 30).

Acompanhando este raciocínio conseguimos seguir para a explicação do próximo achado do estudo que envolve a menor frequência de retenção urinária no pós-operatório imediato de pacientes submetidas a HST. Tal fato também se deve a não abertura da cúpula vaginal para retirada completa do colo. Ao se realizar o rebaixamento da bexiga e uma dissecção do espaço vesico vaginal proximal para, com segurança, abrir a vagina logo após o término do colo e completar a sua remoção, corre-se o risco inerente de provocar uma denervação vesical e separa mecanicamente o terço proximal da vagina da base da bexiga. A bexiga é um órgão muscular oco, de localização anterior ao útero e a vagina e a sua inervação se deve aos plexos esplanico pélvico e vesical, ambos de origem toraco-lombar, fazendo um trajeto acompanhando os ramos da artéria ilíaca interna até sua chegada dorsal à bexiga (31). A denervação vesical é a principal causa da retenção vesical nesses casos pós procedimentos cirúrgicos podendo ser reversíveis ou não (32, 33), porém a teoria integral idealizada em 1990 por Petros aventou o papel importante da musculatura da parede vaginal anterior no auxílio do esvaziamento vesical (24). Os casos de retenção vesical por hipocontratibilidade ou acontratibilidade do músculo detrusor da bexiga podem ser mais intensos conforme mais trauma cirúrgico é

causado ao se rebaixar a bexiga (33). Cirurgias oncológicas como a histerectomia total ampliada ou cirurgia de Wertheim-Meigs é um caso clássico de risco aumentado para retenção vesical no pós operatório já que consiste na remoção, além do colo uterino, também do terço proximal da vaginal, demandando então um rebaixamento vesical ainda maior, assim como um trauma ainda maior (34).

O terceiro achado do nosso estudo, talvez o mais importante e com certeza o mais surpreendente é o do aumento do risco de incontinência urinária de esforço após 2 anos de cirurgia da HST. Tal fato é surpreendente pois, anatomicamente, uma cirurgia que poupasse o colo uterino e seus ligamentos paracervicais promoveria uma melhor sustentação da pelve feminina, melhorando assim as chances de as mulheres conseguirem uma boa resposta de contrabalanceamento das forças descendentes abdominais durante os esforços e mantendo a continência urinária. Tal contrabalanceamento é descrito na clássica teoria integral de Petros (24). No entanto, nossos achados mostram uma discreta tendência de surgimento de incontinência urinária de esforço após 2 anos nestas pacientes submetidas a HST. Tal informação deve, então, ser analisada com cuidado para que nenhum fator que possa causar confusão atrapalhe a análise desses dados. A maioria dos estudos incluídos que avaliavam incontinência urinária a longo prazo de pacientes submetidas a HT e HST (35-39) foram estudos realizados através de envio e resposta de cartas para pacientes após completarem de 5 a 14 anos de cirurgia. As pacientes não foram clinicamente examinadas ou submetidas a anamnese médica especializada, simplesmente responderam perguntas sobre ocorrência de sintomas e da frequência dos mesmos. Tal

viés é somado ao fato de que os grupos poderiam não serem mais comparáveis assim como eram no momento da randomização para os braços dos estudos há 5 ou 14 anos atrás. Todos os autores garantem que as pacientes que responderam as pesquisas após esses anos mantêm o grau de comparação apresentado no momento da randomização, porem nenhum avaliou se no momento da resposta das cartas os grupos eram comparáveis. Dados como peso, comorbidades, vícios, cirurgias previas e outros fatores que podem influenciar o aparecimento de sintomas como incontinência urinária de esforço não foram reavaliados, podendo assim os grupos não serem mais comparáveis entre si. Somada a esses fatos, deve-se atentar à grande perda de seguimento desses follow-ups, reduzindo braços de 160 a 190 paciente para 50 a 70. Tal perda pode ser significativa na análise de dados.

Outra questão a ser avaliada é se o corte temporal realizado após a segunda atualização da revisão pode ter influenciado tal resultado. A revisão original avaliava as pacientes em 6, 12 e 24 meses. Todos esses períodos foram aglutinados, após a primeira atualização, como “curto prazo”, surgindo assim a denominação de “longo prazo” para dados obtidos após 2 anos da cirurgia. Essa mudança foi justificada pelo aumento de trabalhos, muitos deles seguimentos dos trabalhos incluídos na revisão original, que avaliavam os resultados mais tardios das cirurgias. Na época da primeira atualização, os estudos de longo prazo variavam de 4 a 11 anos, com média de 9 anos. Porém o nosso estudo acrescentou trabalhos que elevam o tempo máximo de seguimento para 14 anos. Esse aumento no tempo de seguimento acrescenta mais tempo para fatores confundidores surgirem e pode desbalancear os resultados a favor de uma situação

clínica que está fortemente associada com o processo natural de envelhecimento das mulheres como a incontinência urinária de esforço.

6. CONCLUSÕES

- Nove novos ensaios clínicos foram adicionados à revisão Cochrane sobre HT e HST.
- A histerectomia subtotal abdominal aumentou o risco de incontinência urinária de esforço após 2 anos da cirurgia.
- Não foram encontradas diferenças na função sexual após HT ou HST
- Não foram encontradas diferenças na função intestinal após HT ou HST
- A histerectomia subtotal apresenta um tempo cirúrgico significativamente menor tanto na abordagem laparotômica quanto na laparoscópica.
- A histerectomia subtotal laparoscópica apresenta um tempo de retorno às atividades normais menor do que a histerectomia total laparoscópica.
- A histerectomia subtotal abdominal apresentou menor risco para febre e retenção urinária no pós-operatório recente.

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8. ANEXOS

Anexo 1 – Email de aceite para Revisão Cochrane

UNICAMP

Luiz Gustavo Oliveira Brito <lgobrito@unicamp.br>

RE: AL581 Total versus subtotal hysterectomy for benign gynaecological conditions

Helen Nagels <h.nagels@auckland.ac.nz> 11 de novembro de 2019 02:01
Para: Marcelo Faber <marcelo.faber@gmail.com>, Luiz Gustavo Oliveira Brito <lgobrito@unicamp.br>
Cc: "Anne Lethaby (Gmail)" <elet001@aucklanduni.ac.nz>, "md-cochrane.MDSG" <cochrane.MDSG@auckland.ac.nz>, Anne Lethaby <a.lethaby@auckland.ac.nz>

Greetings Marcelo and welcome to Cochrane.

Thanks for creating your account.

I have added your name to the author list of this review, so you should now be able to access the training modules. The modules are here: https://training.cochrane.org/interactivelearning. These are free; you have to register on the training site - click through to 'new users and subscribers' – and find the link for your access. It looks like a page for people who are paying but it is free for Cochrane authors. Scroll on down and once you are registered then access should open. The software records your progress and a certificate will be available when you complete all 8 essential modules. Numbers 9 and 10 are not relevant to all reviews.

I have attached a couple of file that you will need as you work on the review itself: a file with links to the software you will need, and the guidance document we have developed for authors with our Cochrane group. Do use them both!

Please let me know if you have any questions.

Kind regards

Helen

Helen Nagels
Managing Editor

Cochrane
Gynaecology and Fertility

E h.nagels@auckland.ac.nz **T** +64(09) 923 9489 **M** +64(021) 2951 251
S helen.nagels @CochraneCGF
Department of Obstetrics and Gynaecology / The University of Auckland / Private Bag 92019, Auckland 1142 NZ
cgf.cochrane.org

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Anexo 2 – Protocolo Cochrane PROSPERO

New Cochrane protocols now on PROSPERO

22/11/2013

Publishing protocols is a crucial element of the process of producing Cochrane Reviews. PROSPERO, the international prospective register of systematic reviews in health and social care now provides a place to register protocol information for all such reviews.

PROSPERO is web-based, free to search and open for free registration to anyone undertaking a systematic review with a health-related outcome. Launched in February 2011, PROSPERO, now contains registrations of over 2,300 reviews being undertaken in 63 different countries.

There exists a close relationship between the CRD databases and The Cochrane Library. The CRD databases (DARE, NHS EED and the HTA database) are a component part of The Cochrane Library. In addition to quality assessed reviews DARE contains details of all Cochrane reviews and protocols.

The Cochrane review process and PROSPERO also share common aims: to help avoid unplanned duplication of reviews and minimise the risk of bias by making the production of reviews transparent.

From the inception of PROSPERO, The Cochrane Collaboration has been a strong supporter of the principle of registration of protocols for all systematic reviews. This support has been mobilised in the agreement that new Cochrane protocols are to be included in PROSPERO, and the subsequent joint work to make this happen.

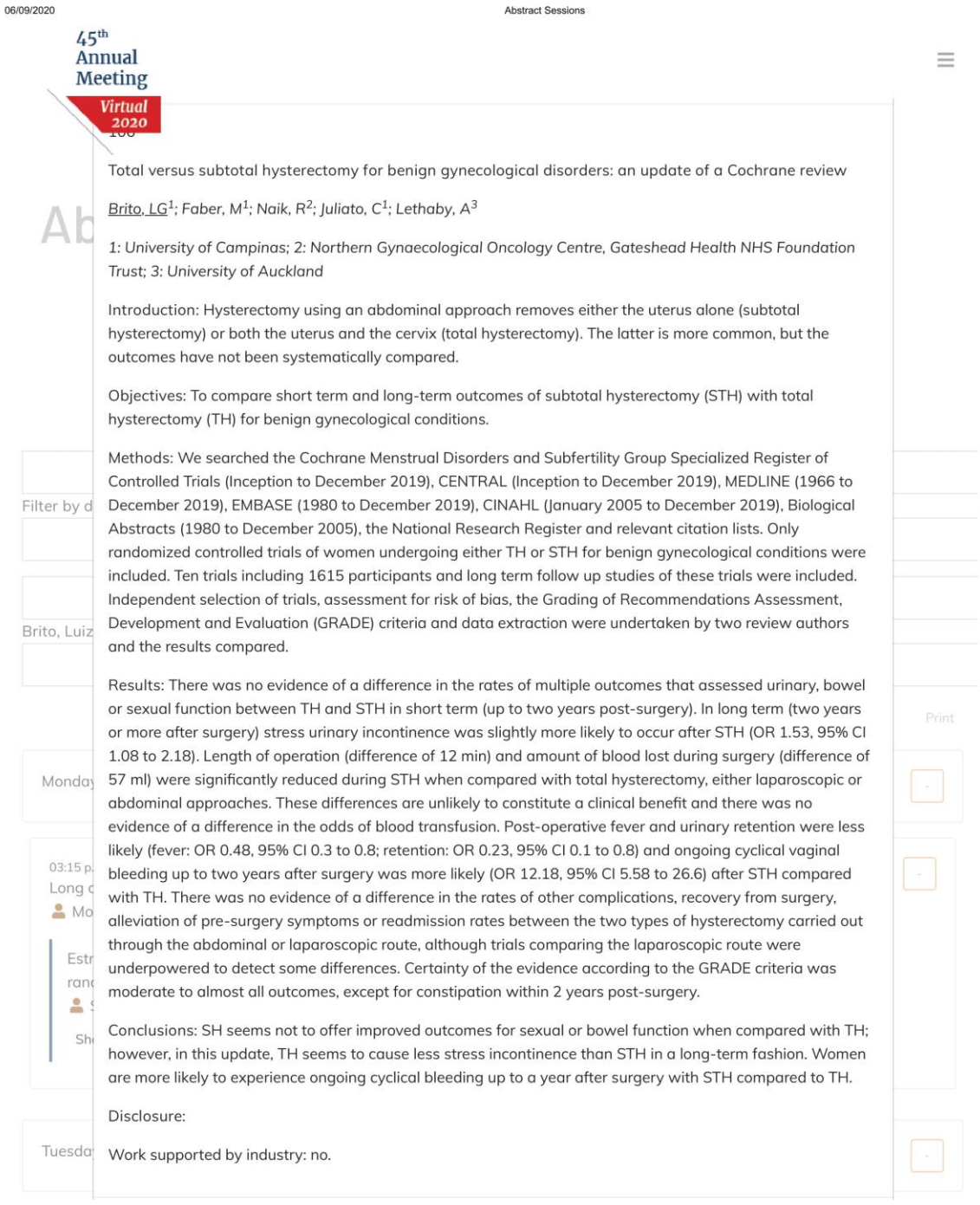
We have now completed work to deliver an automated upload of key features from new Cochrane protocols for intervention and diagnostic test accuracy reviews. There is a good match between the fields in Archie and those in the PROSPERO registration form. Records will be published to PROSPERO and an email sent to the lead author on the Cochrane review to let them know. If there are any queries the lead author can contact the PROSPERO administration staff.

As more and more new Cochrane protocols are included in PROSPERO, we look forward to seeing not only the direct benefits of facilitation of efficient use of research funding and safeguarding against bias, but also the indirect benefits from nudges to improve the quality of systematic reviews and the decisions that rely upon them. We would like to thank everyone for their help and cooperation in putting the Cochrane icing on the PROSPERO cake.

David Tovey, Editor in Chief, The Cochrane Library (**dtovey@cochrane.org**)

Alison Booth and Lesley Stewart, NIHR Centre for Reviews and Dissemination University of York YORK, (**alison.booth@york.ac.uk**)

Anexo 3 – Apresentação Oral no 45th Annual Meeting - International Urogynecological Association (**IUGA**)



06/09/2020 Abstract Sessions

45th Annual Meeting Virtual 2020

Total versus subtotal hysterectomy for benign gynecological disorders: an update of a Cochrane review

Brito, LG[1]; Faber, M[1]; Naik, R[2]; Juliato, C[1]; Lethaby, A[3]

1: University of Campinas; 2: Northern Gynaecological Oncology Centre, Gateshead Health NHS Foundation Trust; 3: University of Auckland

Introduction: Hysterectomy using an abdominal approach removes either the uterus alone (subtotal hysterectomy) or both the uterus and the cervix (total hysterectomy). The latter is more common, but the outcomes have not been systematically compared.

Objectives: To compare short term and long-term outcomes of subtotal hysterectomy (STH) with total hysterectomy (TH) for benign gynecological conditions.

Methods: We searched the Cochrane Menstrual Disorders and Subfertility Group Specialized Register of Controlled Trials (Inception to December 2019), CENTRAL (Inception to December 2019), MEDLINE (1966 to December 2019), EMBASE (1980 to December 2019), CINAHL (January 2005 to December 2019), Biological Abstracts (1980 to December 2005), the National Research Register and relevant citation lists. Only randomized controlled trials of women undergoing either TH or STH for benign gynecological conditions were included. Ten trials including 1615 participants and long term follow up studies of these trials were included. Independent selection of trials, assessment for risk of bias, the Grading of Recommendations Assessment, Development and Evaluation (GRADE) criteria and data extraction were undertaken by two review authors and the results compared.

Results: There was no evidence of a difference in the rates of multiple outcomes that assessed urinary, bowel or sexual function between TH and STH in short term (up to two years post-surgery). In long term (two years or more after surgery) stress urinary incontinence was slightly more likely to occur after STH (OR 1.53, 95% CI 1.08 to 2.18). Length of operation (difference of 12 min) and amount of blood lost during surgery (difference of 57 ml) were significantly reduced during STH when compared with total hysterectomy, either laparoscopic or abdominal approaches. These differences are unlikely to constitute a clinical benefit and there was no evidence of a difference in the odds of blood transfusion. Post-operative fever and urinary retention were less likely (fever: OR 0.48, 95% CI 0.3 to 0.8; retention: OR 0.23, 95% CI 0.1 to 0.8) and ongoing cyclical vaginal bleeding up to two years after surgery was more likely (OR 12.18, 95% CI 5.58 to 26.6) after STH compared with TH. There was no evidence of a difference in the rates of other complications, recovery from surgery, alleviation of pre-surgery symptoms or readmission rates between the two types of hysterectomy carried out through the abdominal or laparoscopic route, although trials comparing the laparoscopic route were underpowered to detect some differences. Certainty of the evidence according to the GRADE criteria was moderate to almost all outcomes, except for constipation within 2 years post-surgery.

Conclusions: SH seems not to offer improved outcomes for sexual or bowel function when compared with TH; however, in this update, TH seems to cause less stress incontinence than STH in a long-term fashion. Women are more likely to experience ongoing cyclical bleeding up to a year after surgery with STH compared to TH.

Disclosure:

Work supported by industry: no.