Economics of urinary and faecal incontinence and prolapse

Committee 21

ICI 7

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† All financial ties (over the last year) that you may have with any business organisation with respect to the subjects mentioned during your presentation

Funding for speaker to attend:

- ☐ Self-funded
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Mary Kilonzo

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Background

- Prolapse, urinary and faecal incontinence affect many people in society
  - Impact on both quality and quality of life
  - Impacts on health and well being
  - Impose considerable financial cost to
    - Individual's
    - Families
    - Health services
    - Society
- These costs illustrate that as societies we devote considerable resources to the management of these conditions

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What is health economics

Economics is the study of how society makes arrangements for the production and distribution of goods and services:

- what to produce
- how to produce
- how to distribute what is produced

Health economics is the application of the discipline and tools of economics to the subject matter of health (Culyer, 1981)

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Why do we need health economics

- Resources are scarce to the extent that there are insufficient resources to meet all possible demands on those resources
- The health service dilemma:
  - Society has limited resources but (almost) unlimited wants
  - How to meet infinite demand from finite resources?

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The need to make choices

- A finite health care budget means we cannot do everything we want
- We have to make choices regarding what to do and what not to do
- This is the area that economics and economic evaluation focuses upon
  - Need to weigh up the benefits from doing something against its costs

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Economist's notion of cost

- The notion underlying the concept of cost used in economics, is different from that used in accountancy
- Choosing to use resources in one beneficial activity means that these resources cannot be used in some other beneficial way
- The 'true' cost of treating one patient is the benefit that might have been enjoyed if those same resources had been used to treat other patients
- Foregone benefit = opportunity cost

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Role of economic evaluation

- A technique that can help users/decision makers use the available recourses in the best way and demonstrate the benefits of the interventions:
  - Identify
  - Measure
  - Value
- All the appropriate cost and consequences of interventions
- The comparative analysis of alternative courses of action in terms of both their costs and their consequences (Drummond et al 2015)

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Types of economic evaluation

<table>
<tr><td rowspan="5">IS THERE COMPARISON OF TWO OR MORE ALTERNATIVES?</td><td></td><td colspan="3">ARE BOTH COSTS AND OUTCOMES OF THE ALTERNATIVES EXAMINED?</td></tr>
<tr><td rowspan="3">NO</td><td colspan="2">NO</td><td>YES</td></tr>
<tr><td>Examines only outcomes</td><td>Examines only costs</td><td rowspan="3">2 PARTIAL EVALUATION
Cost-outcome description</td></tr>
<tr><td colspan="2">1A PARTIAL EVALUATION 1B</td></tr>
<tr><td>Outcome description</td><td>Cost description</td></tr>
<tr><td rowspan="2">YES</td><td colspan="2">3A PARTIAL EVALUATION 3B</td><td rowspan="2">4 FULL ECONOMIC EVALUATION

Cost effectiveness analysis
Cost utility analysis
Cost Benefit analysis</td></tr>
<tr><td>Efficacy or effectiveness evaluation</td><td>Cost analysis</td></tr>
</table>

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Summary of types of economics evaluations

Type	Valuation of costs	Measurement of Outcomes	Valuation of Outcomes
Cost minimisation	Currency (e.g. £, $)	Assumed or demonstrated equivalence	No valuation
Cost effectiveness	Currency (e.g. £, $)	Single measure common to alternatives being evaluated	No valuation common units number of lives saved
Cost consequence	Currency (e.g. £, $)	Several clinical or natural measures	No valuation. Outcomes reported in Natural units
Cost utility	Currency (e.g. £, $)	Single or multiple effects	Valuation with results expressed as Quality adjusted life years (QALYS)
Cost benefit	Currency (e.g. £, $)	Any effects produced by the alternatives	Valuation with results expressed in monetary units

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Progress in last 5 years

- Increasing application of guidelines for methods for economic evaluation such as the Consolidated Health Economic Evaluation Reporting Standards (CHEERS)
- More authors are adhering to the guidelines for reporting economic evaluations
- Increased use of economic evaluations of health technologies

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Short summary of recent literature

1. Non surgical interventions for urinary incontinence:
   - Behavioural therapies
   - Pharmacotherapy
   - Pads
   - PFMT
2. Surgical interventions of stress urinary incontinence
3. Interventions for Urge and OAB
4. Interventions for pelvic prolapse
5. Economic consequences for faecal incontinence

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Non surgical interventions stress urinary incontinence

Behavioural therapies

- There were no new economic evaluations

Pharmacotherapy

- There were no new economics evaluations

Pads

- There were no new economics evaluations

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Non surgical interventions: PFMT

- Simpson et al 2019 compared PFMT with:
  - A disposable tampon device (Impressa)
  - A self-fitting intravaginal incontinence device (Uresta)
  - A traditional incontinence pessary
- PFMT was the most cost-effective treatment option at a willingness to pay of US $50,000 per QALY
- Sjostrom et al 2017compared the PFMT treatment with an app (Tat) with:
  - No treatment
- The app for is a new, cost-effective, first-line treatment with potential for increasing access to care

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Surgical interventions for Stress Incontinence

Javanbakht et al (2020) developed a Markov microsimulations model to compare retropubic mid urethra slings 8 surgical interventions:

(1) anterior vaginal repair or anterior colporrhaphy (2) bladder neck needle suspensions (3) open abdominal retropubic colposuspension (4) laparoscopic retropubic colposuspension (5) traditional suburethral retropubic sling procedures (6) transobturator mid-urethral sling (7) single incision sling procedures (8) periurethral injection bulking agents

The base-case results suggest that retropubic mid-urethral sling (retro-MUS) is the most cost-effective surgical intervention over a 10-year and lifetime time horizon

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Over Active Bladder/Urge

8 Commonly reported pharmacological treatments:

- onabotulinumtoxinA (onabotA)
- oxybutynin (Ditropan)
- tolterodine (Detrol)
- darifenacin (Enablex)
- trospium (Sanctura)
- solifenacin (Vesicare)
- fesoterodine (Toviaz)
- mirabegron (Myrbetriq)

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Over active bladder/urge studies

- 12 Studies identified from several countries
- One conducted alongside an RCT and the rest used decision analysis models (mainly Markov models)
- Varied time frame 1 year – 10 years
- Most studies report QALYs
- All reported ICERS but a few did not report WTP threshold

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Onabotulinumtoxin A (Botox)

- Four studies reported the use of Onabotulinumtoxin A
- Due to high rates of discontinuation with anticholinergics from poor tolerability Onabotulinumtoxin A has been suggested as a first line therapy for OAB

Example (Shepherd et al 2018)

- Compared Botox® with non-selective anticholinergics and selective anticholinergics
- Economic model time frame was 2 years to allow Botox® reinjection and discontinuation of anticholinergics
- Botox® was found to be cost-effective in models with and without refractory costs ($12,429 and $14,437, respectively)

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Other Treatments for UUI / OAB

- Percutaneous tibial nerve stimulation (PTNS)
- Implantable sacral nerve stimulation devices
  - Most costly therapy when compared to Best supported care, PTNS etc (Murray et all 2018)
  - The high cost of sacral neuromodulation is not good value for treating urgency urinary incontinence compared to 200 units Onabotulinumtoxin A (Harvie et al 2020)

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Pelvic organ prolapse

Seven studies were identified

- Two economic evaluations compared non surgical interventions
  1. PFMT
  2. Pessaries
  3. Watchful waiting
- Five economic evaluations compared surgical interventions
  1. Mesh inlays
  2. Uterine preservation
  3. Hysterectomy
  4. Abdominal sacral colpopexy (ASC)
  5. Sacrospinous ligament fixation (SSLF)

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Non surgical interventions for pelvic prolapse

PFMT versus Pessaries

- On average pessaries were more costly but no more effective, with a 95% certainty of cost effectiveness for PFMT in bootstrapping analysis (cost effectiveness threshold not stated) (Panman et al 2016)

PFMT versus watchful waiting

- The results suggested that there was a 55% probability that PFMT would be considered cost effective (Panman et al 2017)

Due to the nature of reporting or the findings themselves the evidence supporting PFMT vs either pessaries or watchful waiting is far from compelling

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Prolapse surgical interventions

Mesh inlay interventions : Primary surgery study

- There was no evidence of benefit from mesh or graft over standard repair for vaginal prolapse in terms of efficacy, quality of life or adverse effects (Glazener et al 2017)

Mesh inlay interventions: Secondary surgery study

- The Secondary surgery trial sample size was too small to provide conclusive results. (Glazener et al 2017)

Uterine preservation with hysterectomy

- The results show additional costs for the Uterine preservation group with no significant difference in the amount of QALYs gained (Hemming et al 2020)

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Prolapse surgical studies

Vaginal vault surgery and abdominal vault surgery

- The results show that abdominal vault repair incurred significant costs but no significant difference was obtained in the QALYs gained (Hemming et al 2020)

Abdominal sacral colpopexy versus sacrospinous ligament fixation

- ASC was estimated to be both more costly and more effective than SSLF with an incremental cost per QALY gained of $24,574 (Ohno et al 2016). No PSA was conducted so hard to assess how robust results were

SSLF with Hysteropexy with SSLF (HP- SSLF), Hysteropexy; uterosacral ligament suspension (HP-US), vaginal hysterectomy with SSLF (VH-SSLF), and vaginal hysterectomy with uterosacral ligament suspension (VH-US

- HP-SSLF was the most cost-effective strategy (Syan et al 2020)No PSA was conducted so hard to assess how robust results were

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Prolapse surgical prolapse

Economic model of eight surgical treatments for primary repair of anterior POP

- Anterior colporrhaphy augmented with mesh appeared to be cost-ineffective in women requiring primary repair of anterior POP (Slade et al 2020)

Summary of prolapse studies

- Robust economic evaluations (Glazener 2017 and Slade 2020) found that mesh was unlikely to be cost effective
- Further research of clinical outcomes and economic evaluations with full probabilistic sensitivity analysis will be beneficially in the understanding of the best surgical techniques to manage pelvic organ prolapse

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Faecal incontinence

- 3 studies were identified
- Two studies Sengoku et al (2018)and Emmanuel A (2016) looked at the Cost-Effectiveness Analysis of Transanal Irrigation for Managing Neurogenic Bowel Dysfunction
- Hounsome et al (2018) compared sacral nerve stimulation and percutaneous tibial nerve stimulation for faecal incontinence using a decision analytic model. The analysis was run over a 5 year time frame
  - Percutaneous tibial nerve stimulation prior to sacral nerve stimulation compared with delivering sacral nerve stimulation straight away was both more effective and less costly in all scenarios
  - The probability of this strategy being cost-effective was around 80% at £20,000–£30,000 per quality-adjusted life-year (QALY)

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Summary of published studies 1

- There were no new economic valuations on non surgical interventions for urinary incontinence for Behavioural therapies, Pharmacotherapy and Pads
- Evidence suggests that PFMT is cost effective when compared with no treatment and containment products
- Evidence on surgical interventions of stress urinary incontinence indicate that retropubic mid-urethral sling (retro-MUS) is the most cost-effective (based on one study which itself was based on a comprehensive systematic review, network meta-analysis and sophisticated model)

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Summary of published studies 2

- For treatment of Urge/OAB Botox is reported to be a cost effective treatment
- Robust economic evaluations for pelvic prolapse (Glazener 2016 and Slade 2020) indicate that mesh is unlikely to be cost effective
- Economic evaluation for faecal incontinence results are similar to those found in the treatment of OAB/Urge
  - PTNS is likely to be cost effective when compared to SNS

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Summary of quality of studies

The quality of new economic evaluations continues to improve as more studies adhere to the guidelines for undertaking economic evaluations

Most reported

- Perspective of the study
- Appropriate utility measures
- Incremental cost effectiveness ratios (ICER)
- Probabilistic sensitivity analysis
- Most provided supplementary material to provide details on study parameters

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Research priorities

- Need for long term follow-up studies
- Clear gaps in the evidence base for some conditions
  - no EEs reported
- Many studies are piecemeal and do not consider all relevant alternatives
  - There is a need for more and better large scale modelling studies based upon best available evidence
- Existing economic evaluations limited in scope and do not consider what the costs and benefits might be of implementation at scale
- Still room for improvement in conduct and reporting of economic evaluations.
  - Disappointing to see some examples of poor practice still being published

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