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Identification and treatment of gestational diabetes: an economic evaluation

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- Outline
- Clarifications
- Discussion points

Outline: Background

- Gestational diabetes (GDM, diabetes first found during pregnancy) affects 3-5% of all pregnancies
  - Usually resolves itself after birth
- Can increase the risk of complications with birth
- Also associated with increased risk of onset of type 2 diabetes later in life
- Treatment might include lifestyle modification or pharmacotherapy (insulin/metformin)
- It is possible to screen for increased risk and to test for presence of GDM

Outline: Methods

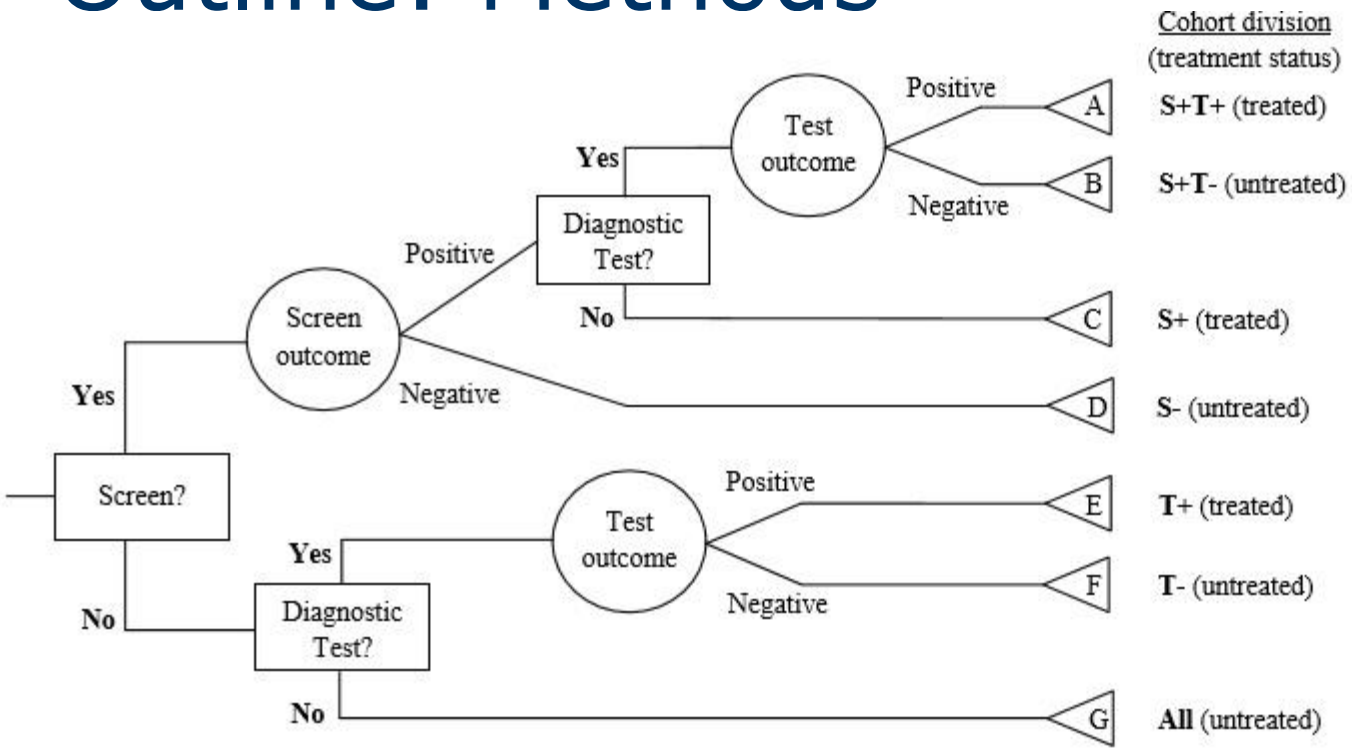
- This study evaluates the cost-effectiveness of screening and testing for GDM
- Uses a probabilistic decision tree
- Risk of adverse outcomes estimated from large cohorts
  - Born in Bradford study (BiB, n=10,353, UK)
  - Atlantic Diabetes in Pregnancy study (Atlantic DIP, n=4,869?, Ireland)
- Costs, QALYs and other probabilities taken from the literature
- EVPI

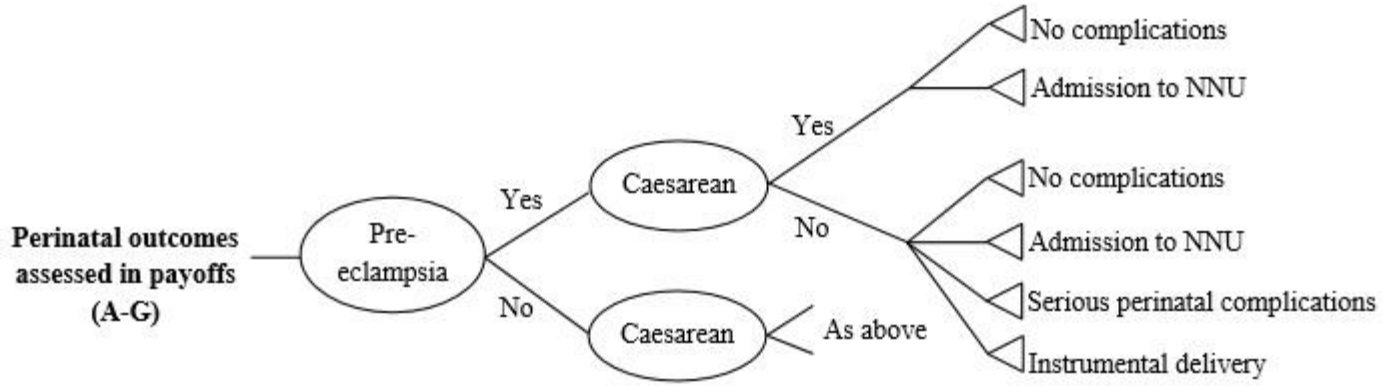
Outline: Methods

Strategies evaluated:

1. Don’t screen and don’t test (do nothing)
2. Universal screening for risk factors and treatment for screen positives (screen only)
3. Universal diagnostic test and treatment for test positives (test only)
4. Universal screening for risk factors followed by diagnostic test for screen positives, with treatment for test positives (screen and test)

Outline: Methods





Outline: Methods

However!

No consensus on how ‘screen positive’ or ‘disease positive’ should be defined.

Study attempts to identify a treatment threshold based on cost-effectiveness.

Threshold based on the results of an oral glucose tolerance test (OGTT)

Outline: Results

"At cost-effectiveness thresholds ranging from £13,000 to £30,000 per QALY it is not cost-effective to identify women for treatment for hyperglycaemia/GDM"

Including longer term outcomes (scenario analysis) may make screening and/or testing cost-effective

EVPI suggests value of more research is high

Clarifications

- The data
  - Does the Atlantic DIP have equivalent data / collection / time / population as BiB?
  - What is actually in these datasets?
  - How were the datasets ‘used jointly’?
  - What exclusion criteria were used?
  - What treatment was received by women in the data?
- How were test and treatment costs ‘calculated’?
- What ‘maternal risk factors’ were used in the risk models?
  - and how were these selected?

Clarifications

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- The model
  - On what basis were perinatal adverse events selected?
  - Is Figure 1 meant to be a decision tree?
    - Simplicity at the expense of accuracy?
  - How are non-attenders handled in the model?
    - Does [Screen: Yes/No] refer to offer of screening or attendance at screening?
    - Probability node within a decision node?
- What does 'treatment' refer to?
  - Dietary and lifestyle advice? Pharmacotherapy?
  - Does each 'treated' pathway receive a fixed treatment regime?
  - Pathway C = 'treated' (dietary and lifestyle advice)
  - Pathway F = 'untreated' (but text says dietary and lifestyle advice)

Some sneaky suggestions

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- Clearer presentation
  - A lot of information. A lot of results… A lack of focus?
  - More background on health impacts of GDM, prognosis and treatment pathways
  - Tables please!!
    - For cost, QALY and NMB results and for thresholds identified
- Precise terminology and definitions
  - Pathways
    - "test only" / "Universal diagnostic test"
    - "No intervention" / "Do nothing"
  - Diagnosis
    - Gestational diabetes / hyperglycaemia
    - Why avoid the word "mellitus"?
  - Thresholds [treatment, diagnostic, risk, willingness-to-pay]
  - Acronyms [IADPSG?]
  - Incremental vs total NMB

Discussion points

- Strategies evaluated
  - Are the pathways selected for evaluation appropriate and justifiable?
  - What about ‘treat everyone’ (with diet and lifestyle modification)?
- Would individual level simulation be better?
  - Particularly for subgroup analyses

Discussion points

- Time horizon
  - Was 'do nothing = cost-effective' an inevitability?
  - If Atlantic DIP included women at 24 weeks, some may not give birth within 3 months
  - Is 3 months a justifiable time horizon when women with GDM are at a much higher risk of developing DM within 5 years of the pregnancy?

Discussion points

- Are the data appropriate?
  - How generalisable is BiB?
  - Should BiB and Atlantic DiP be combined?
  - BiB up to 28 weeks - GDM often develops after this
- Costs
  - Should ‘screening’ be associated with a cost?
    - What if only 1% of women are screened?
  - How relevant are the lifetime costs of treating diabetes (not included)?
- Baseline risk
  - Is the use of the composite outcome ‘serious perinatal complications’ appropriate?
  - Lack of detail in the manuscript - how important is it that these estimates are realistic?

Discussion points

- On the definition of thresholds
  - Do thresholds being evaluated need a clear basis for selection (including maximum, minimum and increments)?
  - Should basis for offering screening be the same basis for offering testing? i.e. risk level?
    - Risk-based screening?
    - Risk-based testing?
  - Is it unreasonable to determine a treatment threshold deterministically?
  - Does the use of a fixed threshold entirely undermine the results for pathways with screening?
    - The population screening positive may be very different to the general population

Discussion points

- On risk stratification
  - General lack of clarity about how risk factors were used in the evaluation.
  - What would be a reasonable basis for defining risk groups? Do arbitrary groupings = arbitrary results.
  - Do subgroup analyses just represent an alternative approach to risk-stratification?

Discussion points

- Ethical challenges
  - Is it ok to determine GDM threshold based on cost-effectiveness estimates?
  - Are there necessary conditions for this approach?
- Implementation
  - How would such a risk-based testing programme be implemented?
  - How do the strategies evaluated relate to existing treatment pathways?
- How does this study relate to literature on threshold approaches to CEA?