Factors associated with abnormal & inconclusive Hysterosalpingograms (HSG) for evaluation of female infertility

Faisal Karim
Caroline Yap
Sarah Aldugman
Francesca Hanson
Samuel Marcus

Queen Elizabeth Hospital
Woolwich
London, UK
Declarations of Interest

None
Introduction

• Infertility affects 1/7 heterosexual couples in the UK

• The main causes of subfertility are:
  • Male factors (30%)
  • Ovulatory disorders (25%)
  • Tubal damage (20%)
  • Uterine or peritoneal disorders (10%)
  • Unexplained (15%)

• 40% of cases have disorders in both sexes
HSG (1)

- A hysterosalpinogram (HSG) is an X-ray procedure used to assess uterine abnormalities and tubal patency.
- A contrast dye is inserted into the uterus via a catheter.
- The uterine cavity will fill with dye, pass through the fallopian tubes and spill into the abdominal cavity in a normal HSG.
- NICE guidance recommends HSG or contrast sonography (HyCoSy) for women with subfertility who are not known to have co-morbidities such as endometriosis, pelvic inflammatory disease or previous ectopic pregnancy.
HSG (2)

- HSG & laparoscopy with dye test are the two most widely used methods to assess tubal patency

- Laparoscopy and dye test is recommended when there is a history of co-morbidities and no contraindication to laparoscopy

- HSG is not a reliable indicator of tubal occlusion

- However, it is a reliable indicator of tubal patency
Aim of the audit

• To ascertain the factors associated with abnormal and inconclusive HSGs

• To find out the outcome of those patients who had abnormal/inconclusive HSG
Method (1)

• Retrospective audit in a South London NHS Hospital

• 108 patient notes reviewed from a possible 159 during the period from April 2015 – July 2016

• Review of medical notes, iCare (electronic noting system) & IMPAX (electronic system for all radiology images & reports) used to access HSG scan reports

• Data entered into spreadsheet database and analysed
Method (2)

- An abnormal HSG was defined as the presence of tubal abnormalities (unilateral/bilateral obstruction, adhesions) and/or uterine abnormalities (intrauterine adhesions, uterine malformation or uterine filling defects).

- Statistical analysis was performed using Chi-squared test to compare variables with $p < 0.05$ considered statistically significant.
Results: Fertility History

• Mean duration of infertility: 33.6 months

• Mean age: 33.2 years
### Results: Primary vs Secondary Subfertility

<table>
<thead>
<tr>
<th>HSG Outcome</th>
<th>Primary Subfertility</th>
<th>Secondary Subfertility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>21 (39%)</td>
<td>14 (33%)</td>
</tr>
<tr>
<td>Abnormal/Inconclusive</td>
<td>33 (61%)</td>
<td>29 (67%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>54</strong></td>
<td><strong>43</strong></td>
</tr>
</tbody>
</table>
# Results: Duration of Infertility

<table>
<thead>
<tr>
<th>HSG Outcome</th>
<th>&lt; 2 years</th>
<th>≥ 2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>23 (40%)</td>
<td>12 (31%)</td>
</tr>
<tr>
<td>Abnormal/Inconclusive</td>
<td>34 (60%)</td>
<td>27 (69%)</td>
</tr>
<tr>
<td>Total</td>
<td>57</td>
<td>39</td>
</tr>
</tbody>
</table>
Results: Age < 30

- 48% Normal HSG
- 52% Abnormal/Inconclusive HSG

p < 0.05
Results: Age ≥ 30

- 69%
- 31%

p < 0.05

- Normal HSG
- Abnormal/Inconclusive HSG
Co-morbidities

- Raised BMI
- Previous surgery including CS
- Previous surgery and raised BMI
- Previous Surgery, Adhesions, PID
## Number of Co-morbidities (1)

<table>
<thead>
<tr>
<th>HSG Outcome</th>
<th>Number of Co-morbidities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Abnormal/Inconclusive</td>
<td>18 (45%)</td>
</tr>
<tr>
<td>No report</td>
<td>0</td>
</tr>
<tr>
<td>Normal</td>
<td>20 (50%)</td>
</tr>
<tr>
<td>abandoned</td>
<td>2 (5%)</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
</tr>
</tbody>
</table>
Number of Co-morbidities (3)

≥2 Co-morbidities

- Abnormal: 63%
- No Report: 5%
- Normal: 21%
- Not Done: 11%

p < 0.05
# Results: Raised BMI

<table>
<thead>
<tr>
<th>HSG Outcome</th>
<th>BMI</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal BMI</td>
<td>Raised BMI</td>
<td></td>
</tr>
<tr>
<td>Abnormal/Inconclusive (n = 62)</td>
<td>41 (55%)</td>
<td>21 (62%)</td>
<td></td>
</tr>
<tr>
<td>No Report (n = 3)</td>
<td>2 (3%)</td>
<td>1 (3%)</td>
<td></td>
</tr>
<tr>
<td>Normal (n = 35)</td>
<td>27 (36%)</td>
<td>8 (24%)</td>
<td></td>
</tr>
<tr>
<td>abandoned (n = 8)</td>
<td>4 (5%)</td>
<td>4 (12%)</td>
<td></td>
</tr>
<tr>
<td>Total (n = 108)</td>
<td>74</td>
<td>34</td>
<td></td>
</tr>
</tbody>
</table>
## Indications for HSG

<table>
<thead>
<tr>
<th>HSG Outcome</th>
<th>Indication for HSG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Co-morbidity but declined laparoscopy</td>
</tr>
<tr>
<td>Abnormal/Inconclusive</td>
<td>1 (50%)</td>
</tr>
<tr>
<td>No report</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Normal</td>
<td>1 (50%)</td>
</tr>
<tr>
<td>abandoned</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Total</td>
<td>2</td>
</tr>
</tbody>
</table>
Tubal Patency

- No Report: 3%
- Abandoned: 7%
- Normal/Patent Tubes: 32%
- Abnormal/Inconclusive: 57%
Why was HSG not done/abandoned?

- No = 8 (7%)
- Cervical stenosis = 2
- Could not find cervix = 1
- Patient could not tolerate procedure = 1
- Technically difficult = 1
- Other = 3
Abnormal/Inconclusive HSG & Subsequent Follow Up

- Referred for IVF or assisted conception – 25 (40%)
- Underwent lap with dye test and proceed – 13 (21%)
- Awaiting lap with dye test and proceed
- Advised weight loss
- Initially became spontaneously pregnant but subsequently miscarried
- Patient and partner no longer a couple
- No longer pursuing tubal patency tests due to male factor
- Awaiting clinic review
Discussion (1)

- Women ≥ 30 years of age are more likely to have abnormal/inconclusive HSGs compared to those < 30 years of age.

- Similarly, women with co-morbidities are more likely to have abnormal/inconclusive HSGs compared to women with zero co-morbidities.

- The greater the age of the woman, the greater the chance of ≥ 1 co-morbidity.

- 21% of co-morbidities were in the < 30 category whereas 79% of co-morbidities were in the ≥ 30 category.
Discussion(2)

• Women without comorbidities should be offered HSG to screen for tubal patency as per NICE/RCOG guidelines

• However, 44% of those undergoing HSGs suffered from comorbidities

• The reasons were some women declined lap and dye and in others, the risks of performing lap and dye exceeded the benefit
Discussion (3)

• There was no association between HSG results and the following factors:
  • Duration of infertility
  • Primary or secondary subfertility
  • BMI
Conclusion

• The most important factors when discussing likely HSG outcome with patients is age and number of co-morbidities

• Although BMI measured by itself did not have a significant effect on outcomes, it may have a synergistic effect when combined with other co-morbidities
References