The Reproducibility of the Endometriosis Fertility Index:

Inter-Observer Variation in the Least Functional Score

Annelize Barnard, Viju Thomas

21 MARCH 2017
Declaration of interests

No conflict of interests to declare

Fellow in Minimal Access Gynaecological Surgery at Stellenbosch University
Endometriosis fertility index: the new, validated endometriosis staging system

G. David Adamson, M.D. and David J. Pasta, M.S.
Fertility Physicians of Northern California, Palo Alto and San Jose, California

Objective: To develop a clinical tool that predicts pregnancy rates (PRs) in patients with surgically documented endometriosis who attempt non-IVF conception.

Design: Prospective data collection on 579 patients and comprehensive statistical analysis to derive a new staging system—the endometriosis fertility index (EFI)—from data rather than a priori assumptions, followed by testing the EFI prospectively on 222 additional patients for correlation of predicted and actual outcomes.

Setting: Private reproductive endocrinology practice.

Patient(s): A total of 801 consecutively diagnosed and treated infertile patients with endometriosis.
The Least Functional score is the most predictive component of the Endometriosis Fertility Index

It is a subjective score, based on findings at surgery

<table>
<thead>
<tr>
<th>Structure</th>
<th>Dysfunction</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tube</td>
<td>Mild</td>
<td>Slight injury to serosa of the fallopian tube</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>Moderate injury to serosa or muscularis of the fallopian tube; moderate limitation in mobility</td>
</tr>
<tr>
<td></td>
<td>Severe</td>
<td>Fallopian tube fibrosis or mild/moderate salpingitis isthmica nodosa; severe limitation in mobility</td>
</tr>
<tr>
<td>Fimbria</td>
<td>Nonfunctional</td>
<td>Complete tubal obstruction, extensive fibrosis or salpingitis isthmica nodosa</td>
</tr>
<tr>
<td></td>
<td>Mild</td>
<td>Slight injury to fimbria with minimal scarring</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>Moderate injury to fimbria, with moderate scarring, moderate loss of fimbrial architecture and minimal intrafimbrial fibrosis</td>
</tr>
<tr>
<td></td>
<td>Severe</td>
<td>Severe injury to fimbria, with severe scarring, severe loss of fimbrial architecture and moderate intrafimbrial fibrosis</td>
</tr>
<tr>
<td></td>
<td>Nonfunctional</td>
<td>Severe injury to fimbria, with extensive scarring, complete loss of fimbrial architecture, complete tubal occlusion or hydrosalpinx</td>
</tr>
<tr>
<td>Ovary</td>
<td>Mild</td>
<td>Normal or almost normal ovarian size; minimal or mild injury to ovarian serosa</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td>Ovarian size reduced by one-third or more; moderate injury to ovarian surface</td>
</tr>
<tr>
<td></td>
<td>Severe</td>
<td>Ovarian size reduced by two-thirds or more; severe injury to ovarian surface</td>
</tr>
<tr>
<td></td>
<td>Nonfunctional</td>
<td>Ovary absent or completely encased in adhesions</td>
</tr>
</tbody>
</table>

Adamson GD, Pasta DJ. Endometriosis fertility index: the new, validated endometriosis staging system. Fertil Steril 2010
Adamson GD, Pasta DJ. Endometriosis fertility index: the new, validated endometriosis staging system. Fertil Steril 2010
Adamson GD, Pasta DJ. Endometriosis fertility index: the new, validated endometriosis staging system. Fertil Steril 2010
Aims

Why this study?

The EFI has been both internally and externally validated\(^1\)-\(^4\)

The Least Functional Score is a new concept

The reproducibility of the Least Functional score has not been assessed

Primary Outcome:

Evaluate the inter-observer agreement of the LFS component of the EFI amongst gynaecologists.

Secondary Outcome:

Stratification of results according to reviewer expertise.

---

Methodology

Prospective study, Tygerberg Hospital, Cape Town.

Laparoscopic footage of 20 gynaecological procedures

Post-operative views of the ovaries, fallopian tubes and fimbriae

Reviewed by 25 gynaecologists
Methodology

Two groups of reviewers

1. Subspecialists
2. Generalists
Methodology

Sub-specialists

Qualified gynaecologists

Advanced endoscopic surgeons or sub-specialists in reproductive medicine

10 such specialists were recruited, 8 completed the review process.
Methodology

Generalists

Qualified gynaecologists

Perform laparoscopic surgery, not meeting sub-specialist criteria

15 such specialists were recruited, 10 completed the review process.
## Results

### Weighted inter-observer agreement

<table>
<thead>
<tr>
<th></th>
<th>Overall</th>
<th>Sub-specialists</th>
<th>Generalists</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Kappa</td>
<td>95% CI</td>
<td>Kappa</td>
</tr>
<tr>
<td>Left Fallopian Tube</td>
<td>0.464</td>
<td>0.305-0.661</td>
<td>0.501</td>
</tr>
<tr>
<td>Right Fallopian Tube</td>
<td>0.614</td>
<td>0.460-0.812</td>
<td>0.706</td>
</tr>
<tr>
<td>Left Fimbria</td>
<td>0.529</td>
<td>0.353-0.747</td>
<td>0.612</td>
</tr>
<tr>
<td>Right Fimbria</td>
<td>0.578</td>
<td>0.389-0.813</td>
<td>0.689</td>
</tr>
<tr>
<td>Left Ovary</td>
<td>0.534</td>
<td>0.270-0.889</td>
<td>0.541</td>
</tr>
<tr>
<td>Right Ovary</td>
<td>0.572</td>
<td>0.350-0.872</td>
<td>0.590</td>
</tr>
<tr>
<td>Left LFS Subtotal</td>
<td>0.488</td>
<td>0.333-0.676</td>
<td>0.550</td>
</tr>
<tr>
<td>Right LFS Subtotal</td>
<td>0.599</td>
<td>0.476-0.753</td>
<td>0.625</td>
</tr>
<tr>
<td>LFS</td>
<td>0.485</td>
<td>0.351-0.651</td>
<td>0.520</td>
</tr>
</tbody>
</table>
Summary

20 Videos

10 Sub-specialists

Moderate Agreement
K = 0.52

15 Generalists

Moderate Agreement
K = 0.565

Overall

Moderate Agreement
K = 0.485
Findings

Moderate overall agreement for the Least Functional Score ($\kappa = .485$)

Both groups achieved moderate or substantial agreement for all structures

No statistically significant difference between the two groups

There is a clear trend visible, with the sub-specialists consistently achieving higher Kappa values for all the structures
Conclusion

We found the LFS to be moderately reproducible with no statistically significant difference in the performance of sub-specialists and general gynaecologists.

We therefore conclude that the EFI can be used in clinical practice by clinicians of varied levels of experience.
Thank You

Email: annelizebarnard@me.com