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Use of the endometriosis fertility index in daily practice: A prospective evaluation

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ABSTRACT

Objective: To perform a prospective evaluation of postoperative fertility management using the endometriosis fertility index (EFI).
Study: This prospective non-interventional observational study was performed from January 2013 to February 2016 in a tertiary care university hospital and an assisted reproductive technology (ART) centre. In total, 196 patients underwent laparoscopic surgery for endometriosis-related infertility. Indications for surgery included pelvic pain (dysmenorrhoea, and/or deep dyspareunia), abnormal hysterosalpingogram, and failure to conceive after three or more superovulation cycles with or without intra-uterine insemination. Multidisciplinary fertility management followed the surgical diagnosis and treatment of endometriosis. Three postoperative options were proposed to couples based on the EFI score: EFI score $\leq$4, ART (Option 1); EFI score 5–6, non-ART management for 4–6 months followed by ART (Option 2); or EFI score $\geq$7, non-ART management for 6–9 months followed by ART (Option 3). The main outcomes were non-ART pregnancy rates and cumulative pregnancy rates according to EFI score. Univariate and multivariate analyses with backward stepwise logistic regression were used to explain the occurrence of non-ART pregnancy after surgery for women with EFI scores $\geq$5. Adjustment was made for potential confounding variables that were significant ($p < 0.05$) or tending towards significance ($p < 0.1$) on univariate analysis.
Results: The cumulative pregnancy rate was 76%. The total number of women and pregnancy rates for Options 1, 2 and 3 were: 26 and 42.3%; 56 and 67.9%; and 114 and 87.7%, respectively. The non-ART pregnancy rates for Options 1, 2 and 3 were 0%, 30.5% and 48.2%, respectively. The ART pregnancy rates for Options 1, 2 and 3 were 50%, 60.6% and 80.3%, respectively. The mean time to conceive for non-ART pregnancies was 4.2 months. The benefit of ART was inversely correlated with the mean EFI score. On multivariate analysis, the EFI score was significantly associated with non-ART pregnancy (odds ratio 1.629, 95% confidence interval 1.235–2.150).
Conclusion: In daily prospective practice, the EFI was useful for subsequent postoperative fertility management in infertile patients with endometriosis.

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Introduction

European and American guidelines [1,2] for the management of endometriosis-associated infertility are based on the stage of the disease according to the American Society of Reproductive Medicine (ASRM) classification or the revised American Fertility Society score (rAFS) [3,4]. Unfortunately, these classifications have limitations [5], especially in terms of effectiveness to predict postoperative pregnancy [6,7]. Another limitation is the failure to account for the different types of endometriotic lesions (e.g. superficial peritoneal and deep infiltrating endometriosis, endometrioma, adenomyosis etc.). However, the endometriosis phenotype could be related to natural fertility.

Considering the management of infertility, the first-line treatment remains unclear. On one hand, assisted reproductive technology (ART) could be the first option for women with a high risk of damage (e.g. asymptomatic deep or extensive

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endometriosis, previous surgery, recurrent endometrioma, postoperative complications) after surgery. On the other hand, surgery could be proposed to enhance non-ART pregnancy, especially after complete surgery.

Since 2010, the endometriosis fertility index (EFI) has been used for women who are concerned about their future fertility [8]. The EFI includes historical factors (age, duration of infertility, previous pregnancy) and surgical factors [total AFS score, AFS endometriotic lesions that negatively adjusted the score in the case of endometrioma or complete obliteration of the pouch of Douglas, and the least function score as the anatomic and functional result of the surgery on adnexae] (Fig. 1). The EFI is the first classification to give a clinical outcome following surgical diagnosis and treatment of endometriosis. Several external retrospective or combined studies have validated the EFI [9,10].

In a retrospective EFI validation, Boujenah et al. found that the benefit of ART was greater for patients with a low EFI score in terms of non-ART pregnancy rates [9]. These results could encourage rapid referral of patients with low EFI scores to ART management.

The World Endometriosis Society Consensus agreed that the EFI could be used for counselling couples, to provide reassurance to women with good prognoses, and to enable rapid referral of women with poor prognoses to ART management [11]. EFI could also be considered as a predictive factor for a spontaneous second pregnancy in fertility management [12].

However, the lack of prospective data on postoperative fertility management and results based on the EFI limit the counselling of women with endometriosis-related infertility. To date, a strict prospective evaluation of use of the EFI in daily practice has not been undertaken. Therefore, the aim of this study was to perform a prospective evaluation of postoperative fertility management using the EFI.

Materials and methods

Study design and patient selection

A prospective observational study was undertaken of all consecutive patients treated for infertility, who underwent a laparoscopy with histologic diagnosis and treatment of endometriotic lesions and who were offered postoperative fertility management based on their EFI score from 1 January 2013 to 29 February 2016.

Data were gathered from a tertiary care university hospital registry. All women underwent surgery at the university hospital, and were informed that data were entered routinely and prospectively into an electronic record-keeping system contributing to the PMSI (national "Programme de médicalisation des systemes d'information" L.710.5 du Code de la Santé Publique,

LEAST FUNCTION (LF) SCORE AT CONCLUSION OF SURGERY

Score		Description		Left		Right		
4	=	Normal	Fallopian Tube					
3	=	Mild Dysfunction						
2	=	Moderate Dysfunction	Fimbria					
1	=	Severe Dysfunction						
0	=	Absent or Nonfunctional	Ovary					
To calculate the LF score, add together the lowest score for the left side and the lowest score for the right side. If an ovary is absent on one side, the LF score is obtained by doubling the lowest score on the side with the ovary.			Lowest Score		+		=	
				Left		Right		LF Score

ENDOMETRIOSIS FERTILITY INDEX (EFI)

Historical Factors			Surgical Factors		
Factor	Description	Points	Factor	Description	Points
Age			LF Score		
	If age is ≤ 35 years	2		If LF Score = 7 to 8 (high score)	3
	If age is 36 to 39 years	1		If LF Score = 4 to 6 (moderate score)	2
	If age is ≥ 40 years	0		If LF Score = 1 to 3 (low score)	0
Years Infertile			AFS Endometriosis Score		
	If years infertile is ≤ 3	2		If AFS Endometriosis Lesion Score is < 16	1
	If years infertile is > 3	0		If AFS Endometriosis Lesion Score is ≥ 16	0
Prior Pregnancy			AFS Total Score		
	If there is a history of a prior pregnancy	1		If AFS total score is < 71	1
	If there is no history of prior pregnancy	0		If AFS total score is ≥ 71	0
Total Historical Factors			Total Surgical Factors		

EFI = TOTAL HISTORICAL FACTORS + TOTAL SURGICAL FACTORS: Historical + Surgical = EFI Score

Fig. 1. Endometriosis Fertility Index created by Adamson and Pasta (8).

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