The Effect of Laparoscopic Cystectomy on Ovarian Reserve in Patients with Endometrioma

Thesis

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بسم الله الرحمن الرحيم

قَالُوا
سُبْحَانَكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

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Contents

Subjects	Page

List of Abbreviations

AFC	:	Antral follicular count
AFS	:	American Fertility Society
AMH	:	Anti-Mullerian Hormone
AMHRII	:	Anti-Mullerian hormone receptor type II
ART	:	Assisted reproductive technologies
ASRM	:	American Society for Reproductive Medicine
BMD	:	Bone mineral density
BMps	:	Bone morphogenic proteins
CA 19-9	:	Cancer Antigen 19-9
CA125	:	Cancer Antigen 125
CC	:	Clomiphene citrate
CCCT	:	Clomiphene citrate challenge test
COC	:	Combined oral contraceptive
COX-1	:	Cyclo-oxgenase-1
COX-2	:	Cyclo-oxygenase-2
E2	:	Estradiol hormone
FSH	:	Follicle stimulating hormone
GAST	:	Gonadotropin analogue stimulation test
GC	:	Granulosa cell
GCs	:	Granulosa cells
GLSs	:	Granulosa luteal cells
GnRH	:	Gonadotropin-releasing hormone
HCG	:	Human chorionic gonadotropin
HRT	:	Hormonal replacement therapy

ICSI	**:**	Intracytoplasmic sperm injection
IVF	**:**	In-vitro fertilization
IVM	**:**	In vitro maturation
LH	**:**	Lutinizing hormone
LUNA	**:**	Laparoscopic uterine nerve ablation
MCL	**:**	Menstrual cycle length
MOD	**:**	Mean ovarian determinant
MPA	**:**	Medroxyprogesterone acetate
MRI	**:**	Magnetic resonance imaging
Oc	**:**	Oral contraceptives
OR	**:**	Ovarian reserve
PCOS	**:**	Polycystic ovarian syndrome
PGE2	**:**	Prostaglandin E2
rFSH	**:**	Recombinant Follicle stimulating hormone
SD	**:**	Standard deviation
SHBG	**:**	Sex hormone binding globulin
SPRMs	**:**	Selective progesterone receptor modulators
TAFC	**:**	Total antral follicular count
TGF	**:**	Transforming growth factor
TGF-B	**:**	Transforming growth factor beta
TNF	**:**	Tumor necrotizing factor
TVS	**:**	Transvaginal ultrasound
US	**:**	Ultrasound

List of tables (for Review)

List of tables (for Results)

List of Figures (for Review)

List of Figures (for Results)

Abstract

Endometriosis is an important disease that affects monthly fecundity rate or the success of the assisted reproductive technologies (ART). The prevalence of endometriosis is approximately 6-8%, and it is usually diagnosed during laparoscopic surgery for the evaluation of pelvic painj. The prevalence of endometriosis is higher among infertile women than fertile. Of the surgical population, endometriosis was diagnosed in 25% of women who had a laparoscopy for pelvic pain and in 20% of women who underwent surgery for infertility.

Endometriosis is one of the most commonly encountered diagnoses in ovarian surgery and may be present in up to 17-44% of patients with endometriosis. Ovarian endometriomas are usually associated with the symptoms of dysmenorrhea, chronic pelvis pain, dyspareunia, and infertility. Previous studies have demonstrated that endometriomas can negatively affect the rate of spontaneous ovulation, as well as reducing the amount of follicular number and activity in the adjacent ovarian tissues.

Theraputic approach for women with ovarian endometrioma may vary according to the age of women, size of the cyst, symptoms, and desire for the future conception. Laparoscopic cystectomy for endometrioma is common and seems to be feasible in terms of post-operative fecundability and recurrence rate compared with that of fenestration and coagulation of the cyst wall. However, the safety of this technique with respect to residual ovarian damage has been questioned.

Key words

Endometriosis

Ovarian endometriomas

Laparoscopic cystectomy

Ovarian reserve

Introduction

Endometriosis refers to the presence of endometrial glands and stroma outside the uterine cavity, most commonly on the membrane which line the abdominal cavity, the peritoneum. The uterine cavity is lined with endometrial cells which under the influence of female hormones. Endometrial cells in areas outside the uterus are also affected by hormonal changes and respond in a way that is similar to the cells found inside the uterus. It is a common gynaecological condition, often presenting with pelvic pain and infertility. The pain often is worse with the menstrual cycle and is the most common cause of secondary dysmenorrhea. Endometriosis was first identified by Baron Carl von Rokitansky in 1860 *(Batt and Ronald, 2011)*.

Endometrioma is the formation of ovarian cyst lined by the endometrial glands and stroma; it is surrounded by psudocapsule adjacent to healthy ovarian tissue. It accounts for 17%-44% of patients with endometriosis *(Nicolle and Donnez, 1997).*

Different theories implicated in the pathogenesis of endometriosis indicate that the etiology of endometriosis is complex and multifactorial, involving:

Retrograde menstruation theory of Sampson: this is the oldest principle explaining the etiology of endometriosis. The theory propsoses that endometriosis occurs due to the retrograde flow of sloughed endometrial cells/debris via the fallopian tubes into the pelvic cavity during menstruation. However, retrograde menstruation occurs in 76%-90% of women with patent fallopian tubes and not all of these women have endometriosis *(Sasson and Taylor, 2008).*

Immune Dysfunction: The regurgitation of endometrial cells into the peritoneum triggers an inflammatory response recruiting activated macrophages and leucocytes locally which may cause defective "immune-survillance" that prevents elimination of menstrual debris and promotes the implantation and growth of endometrial cells in the ectopic sites *(Donnez et al., 2013).*

Metaplasia: Other theories have proposed that endometriosis originates from extrauterine cells that abnormally transdifferentiate into endometrial cells. The coelomic metaplasia theory pustulates that the endometriosis originates from the metaplasia of specialized