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

Thesis

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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

E List of Abbreviations &

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

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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).

Dysfunction: The regurgitation Immune 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 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