

Effect of Long Protocol on the Outcome of *In Vitro* Fertilization-embryo Transfer in Patients with Endometriosis Compared with Prolonged Protocol

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Objective To investigate the effect of different down-regulation protocol on the *in vitro* fertilization-embryo transfer (IVF-ET) outcomes in infertile patients with endometriosis (EMs).

Methods A retrospective case control study was performed. Totally 294 infertile patients with EMs were enrolled. And 109 patients (116 cycles) received prolonged protocol as the control, 185 patients (193 cycles) received long protocol as case group, all followed by standard controlled ovarian hyperstimulation (COH). Response to gonadotropins, the fertilization rate, the cleavage rate, the implantation rate, the clinical pregnancy rate and the miscarriage rate were measured and analyzed between the two groups.

Results A trend toward better ovarian response was observed in long protocol group. Higher fertilization rate, lower total dose of rFSH, shorter duration of stimulation and more endometrial thickness on the day of hCG injection were observed in long protocol group compared with those of prolonged protocol group, and the difference was significant ($P < 0.05$). In addition, the clinical pregnancy rate, the cleavage rate and the implantation rate also had an increase trend in long protocol group compared with those of prolonged protocol group, but without significant differences.

Conclusion Long protocol regimen before IVF-ET in patients with EMs resulted in a trend toward better ovarian response and higher clinical pregnancy rates than prolonged protocol regimen did.

Key words: endometriosis (EMs); down-regulation protocol; controlled ovarian hyperstimulation (COH); IVF-ET; pregnancy rate

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Endometriosis (EMs) is a disease characterized by ectopic growth of endometrial stroma and glands. Its characteristic symptoms include severe dysmenorrhoea, dyspareunia, infertility and chronic pelvic pain^[1].

EMs may distort normal pelvic anatomy and affect embryo development, which result in infertility eventually^[2-6]. It is well known that *in vitro* fertilization-embryo transfer (IVF-ET) was developed to treat tubal-factor infertility originally^[7]. It has become an appropriate treatment for patients with EMs today, and diverse controlled ovarian hyperstimulation (COH) protocol has been used. Up to now, the impact of different COH protocols on the outcome of IVF-ET in patients with EMs is controversial. It has been suggested that the administration of gonadotrophin releasing hormone (GnRH) agonists for a few months prior to COH in women with EMs increases the pregnancy rate^[8-10].

However, we found there was a little difference in the clinical works. We found that prolonged protocol may cause more degree of pituitary suppression and require higher doses of gonadotropin for COH, and long protocol has the same pregnancy rates. So the aim of this study is to determine whether long protocol is more favorable on the pregnancy outcome of IVF-ET in patients with EMs, and patients with prolonged protocol serve as controls.

Materials & Methods

Subjects

Totally 294 infertile patients were enrolled retrospectively. Inclusion criteria were as follows: 1) aged between 25 and 40 years; 2) all patients had previously diagnosed EMs through laparoscopic surgery and undergone unilateral or bilateral laparoscopic endometrioma cystectomy; patients with stage III/IV EMs were included into our study; 3) serum basal FSH concentration <10 mIU/ml and serum basal estradiol (E₂) <50 pg/ml just before starting COH; 4) presence of 2 functional ovaries and normal uterine cavity; 5) no treatment of gonadotrophins within 3 months before this study. Infertility caused by tubal factor, PCOS, male factor or unexplained factor were excluded out of this study.

Methods

The long protocol group consisted of 185 patients (193 cycles) who received GnRH agonist triptorelin acetate subcutaneous injection 0.05–0.1 mg/d (0.1 mg, Ferring International Center SA, Switzerland) during the previous midluteal phase for 14 d. The prolonged protocol group consisted of 109 patients (116 cycles) who received a long-acting GnRH agonist 3.75 mg intramuscular injection (3.75 mg, triptorelin acetate injection, Ferring International Center SA, Switzerland) during the previous early follicular phase for one month. After pituitary down-regulation (E₂ level <50 pg/ml, LH level and FSH level <5 mIU/ml) was achieved, COH commenced in two groups. The starting dose of recombinant FSH (75 IU/d or 450 IU/d, Gonol-F, Merck Serono S.p.A., Italy) and/or hMG (75 IU/ampoule, menotropins,

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