Clinical Efficacy and Analysis of Letrozole Combined with Li Shenbao Treatment in Ovarian Hyporesponsiveness

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We attempt to investigate and study the clinical efficacy of letrozole combined with Li Shenbao treatment in patients with ovarian hyporesponsiveness and improve the clinical treatment effect of patients. We selected 153 patients with ovarian hyporesponsiveness in a hospital from January 2018 to December 2020 as the study objects and divided them into 2 groups according to when they enter the *in vitro* fertilization assisted pregnancy cycle. Control group consists of 76 patients treated with antagonist protocol, while observation group consists of 77 patients treated with letrozole combined with Li Shenbao treatment. The clinical outcomes of the patients with low ovarian hyporesponsiveness were assessed and compared. The results showed that observation group possessed higher M II egg rate, high-quality embryo rate and clinical pregnancy rate than control group ($p<0.05$). Observation group possessed lower miscarriage rate than control group ($p<0.05$). The clinical efficacy of Li Shenbao combined with letrozole in patients with ovarian hyporesponsiveness is of good value. This treatment regimen can better improve the ovulation promotion outcome, and to a certain extent, increase the clinical pregnancy rate and reduce the miscarriage rate, and this combination treatment plan has good application prospects.

Key words: Letrozole, Li Shenbao, ovarian hyporesponsiveness, antagonist, gonadotropin

Ovarian hyporesponsiveness clinically refers to the comprehensive clinical outcome of patients with few developing follicles, increased gonadotropin dosage, poor embryo quality and high miscarriage rate during ovulation promotion, which mainly occurs in infertility couples undergoing assisted reproductive technology for fertility treatment and is generally a poor response after the application of drugs[1]. A study by the world health organization found that the average age of women at first birth has increased by 3 y compared to 20 y ago, which means that the average age of women at first birth is gradually increasing, mainly due to economic development, changes in fertility attitudes and women's career plans[2,3]. According to clinical statistics, the incidence of infertility among pregnant couples in China has reached 26 %, which seriously affects the fertility rate, so many infertile couples will choose to take assisted reproduction technology to assist conception, but some patients have poor ovarian response after applying drugs in the process of assisted reproduction technology to assist conception, which leads to low ovarian response[4]. Currently, about 20 % of patients undergoing assisted reproductive technology will have ovarian hyporesponsiveness, and there is a certain age distribution, for example, the probability of ovarian hyporesponsiveness in patients older than 40 y old is as high as 50 %, so it is usually necessary to combine other pharmacological interventions to reduce the incidence of ovarian hyporesponsiveness and improve the efficiency of assisted reproductive technology in patients with ovarian hyporesponsiveness[5]. We selected 153 patients with ovarian hyporesponsiveness in a hospital from January 2018 to December 2020 as the study objects, and divided them into 2 groups according to when they enter the *In Vitro* Fertilization (IVF) assisted pregnancy cycle. Control group consists of 76 patients treated with antagonist protocol, while observation group consists of 77 patients treated with letrozole combined with Li Shenbao treatment. The ages of all patients in this study were between 22 y and 45 y old and their medical records were collected after investigation by the physician after

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admission, in addition, the patients met the relevant diagnostic criteria for ovarian hyporesponsiveness and the diagnosis was confirmed by a physician with 2 y or more of clinical experience combined with laboratory indicators[6]. Secondly, patients were conscious during the study and were able to complete the treatment protocol in accordance with the requirements of the health care provider, the physician conducted a basic understanding of the patients enrolled in the study, patients with allergy or history of allergy to letrozole and Li Shenbao used in this study were excluded from the study, as were patients with combined immunodeficiency diseases or severe functional impairment of the liver and kidneys. They used a fixed antagonist protocol to give ovulation treatment to patients with ovarian hyporesponsiveness. Patients came to the hospital on 2 d and 3 d of their menstrual period, vaginal ultrasound was performed to check the condition of the patient's sinus follicles and blood was drawn to test Follicle-Stimulating Hormone (FSH), Luteinizing Hormone (LH), Estradiol (E2) and Progesterone (P). If there was no abnormality, started ovulation and adopted Li Shenbao 150-225 IU/day for 5 d. On the 6th d of ovulation, the patient returned to the hospital for a vaginal ultrasound to monitor the follicle size and blood test for LH, E2 and P. On the same day, the patient continued ovulation promotion at the same dosage and started to add the antagonist cetrorelix acetate 0.25 mg/d, fixing the dosage of the drug and arranging the patient's return to the hospital according to the follicle size and hormone level until at least 2 dominant follicles of 18 mm or more were considered as follicle mature, giving Human Chorionic Gonadotropin (HCG) 4000 IU and treprostinil acetate 0.2 mg trigger and retrieved eggs 36 h after trigger. Patients were counted for M II egg rate, high quality embryo rate, clinical pregnancy rate and miscarriage rate. Patients with ovarian hyporesponsiveness in the observation group were given letrozole combined with Li Shenbao to promote ovulation. Patients came to the hospital on 2 d and 3 d of their menstrual period, vaginal ultrasound was performed to check the condition of the patient's sinus follicles and blood was drawn to test FSH, LH, E2 and P. If there was no abnormality, started ovulation and adopted letrozole 2.5-5 mg/day for 5 d, and added 75-150 IU/day of Li Shenbao on the 4th d of letrozole ovulation promotion. On the 6th d of ovulation promotion, the patient returned to hospital for vaginal ultrasound to monitor follicle size and blood test for LH, E2 and P. On the same day, the patient continued to promote ovulation at the same dosage, fixing the dosage of medication and arranging the patient's return to hospital according to follicle size and hormone level. Gave antagonist cetrorelix acetate for injection 0.25 mg/day when LH value is 2 times or more than the menstrual LH value until at least 2 dominant follicles are above 18 mm which is considered as follicle maturity, gave HCG 10 000 IU trigger and retrieved eggs 36 h after the trigger. The patients' M II egg rate, high quality embryo rate, clinical pregnancy rate and miscarriage rate were counted. The clinicians will count and compare ovulation outcomes of the patients with ovarian hyporesponsiveness, including M II egg rate, high quality embryo rate, clinical pregnancy rate and miscarriage rate. Compared the above data on the effect of ovulation promotion and pregnancy outcome separately, noting that the number of cases in the respective patients was counted and divided by the total number of cases to obtain the corresponding data values, with all diagnoses referring to the relevant criteria in the guidelines for the diagnosis and treatment of common diseases in reproductive medicine[7]. During the treatment, hormone levels were measured in venous blood, including LH indicator level values, FSH indicator level values, E2 and P indicator level values. The assay kits were purchased from Shanghai Enzyme Link Biotechnology Co., Ltd. and the assay process was carried out in strict accordance with the clinical test standards and the instructions in the assay kits[8,9]. Data from this study were analyzed using statistical software and $p<0.05$ was considered a difference. The results showed that observation group possessed better ovulation promotion effect than control group overall ($p<0.05$) as shown in Table 1. The results showed that observation group possessed higher clinical pregnancy rate than control group and in contrast lower miscarriage rate than control group ($p<0.05$) as shown in Table 2. The occurrence of ovarian hyporesponsiveness is mainly associated with a decrease in the ovarian reserve function of the patient and some clinical studies have indicated that advanced age is also an important risk factor for its occurrence, where the endogenous estrogen in the body is affected by age, and the secretion of endogenous follicular estrogen decreases as the body ages[10]. In addition, as the ovarian follicles in the body are gradually depleted and undergo a continuous process of ageing, fertility generally declines in

women older than 35 y of age, while clinical studies have shown that women under 35 y of age have better ovarian function and a higher chance of conception. It has been suggested that adjuvant pharmacological interventions can improve ovarian response and thus improve the clinical pregnancy outcome of patients with ovarian hyporesponsiveness to a greater extent[11]. The results of this study showed that generally observation group possessed better ovulation and pregnancy outcomes than control group, and that letrozole combined with Li Shenbao had a higher M II egg rate, high quality embryo rate and clinical pregnancy rate than the antagonist ovulation protocol and a lower early miscarriage rate than the antagonist protocol. Letrozole, a common aromatase inhibitor, has a significant inhibitory effect on aromatase activity upon entry into the body, thus relieving the negative feedback response caused by oestrogen in the body, in turn; a better ovulation promotion effect can be achieved. In addition, some clinical scholars believe that oocyte and follicle maturation is a complex process that requires several stages and the involvement of follicle stimulating hormone and LH, and letrozole is an effective drug that can promote the release of these two hormones and thus improve the clinical outcome of patients with ovarian hyporesponsiveness[12]. In summary, the clinical efficacy of Li Shenbao combined with letrozole in patients with ovarian hyporesponsiveness is of good value. This treatment regimen can better improve the ovulation promotion effect and pregnancy outcome and this combination treatment plan has good application prospects.

TABLE 1: COMPARISON OF THE OVULATION PROMOTION EFFECT BETWEEN BOTH GROUPS [n (%)]

Group	Cases	M II egg rate	High quality embryo rate
Control	76	50 (65.79 %)	31 (40.79 %)
Observation	77	63 (81.82 %)	43 (55.84 %)
χ^2		20.314	18.374
p		<0.05	<0.05

TABLE 2: COMPARISON OF CLINICAL PREGNANCY AND MISCARRIAGE RATES BETWEEN BOTH GROUPS [n (%)]

Group	Cases	Clinical pregnancy rate	Miscarriage rate
Control	76	33 (43.42)	15 (19.74 %)
Observation	77	46 (59.74 %)	8 (10.39 %)
χ^2		21.172	17.364
p		<0.05	<0.05

Conflict of interests:

The authors declared no conflict of interests.

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