Effect of Compound Xuanju Capsule Plus Levocarnitine on Tesosterone Levels and Sperm Quality with Oligoasthenospermia

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Abstract: <u>Objective</u>: To investigate the clinical efficiency of Compound Xuanju Capsule combing with L-carnitine on oligospermia/asthenospermia. <u>Methods</u>: A total of 120 patients with oligospermia or asthenospermia were assigned into group A, B and C with 40 cases in each. Group A was treated with Compound Xuanju Capsule (2 grain, 3 times a day) + L-Carnitine (10mL, 2 times a day). While group B and C was treated with Compound Xuanju Capsule (2 grain, 3 times a day) and L-Carnitine (10mL, 2 times a day) separately. Sperm samples were analyzed with CASA and and plasma hormone levels were assayed with RIA before and after 3 months of treatment. <u>Results</u>: After treatment, all patients showed improvement in sperm parameters and increase in testosterone levels (P<0.05). Specially, improvement in group A was significant obvious than that in group B and C (P<0.05), but no significant difference was observed between the latter two groups (P>0.05). <u>Conclusions</u>: Compound Xuanju Capsule combing with L-Carnitine can improve the sperm quality and raise hormone levels in patients with oligospermia or asthenospermia, and can be an effective treatment for male infertility.

Keywords: Compound Xuanju capsule, Levocarnitine, Oligozoospermia, Asthenospermia.

1. Introduction

According to statistics, the total number of infertility patients in the world is 10%-15%, of which male factor is 23.9%, while sperm abnormalities account for 22.7%[1] of male factors. The most common results of semen analysis are oligozoospermia and asthenospermia, while oligozoospermia and asthenospermia are more common and the incidence rate is higher. In this study, 120 patients with oligozoospermia and asthenospermia were divided into three groups with 40 patients in each group. The efficacy of compound Xuanju capsule combined with Levocarnitine oral liquid and single drug were compared and analyzed.

2. Data and Methods

2.1 Clinical Data

120 patients with oligozoospermia and asthenospermia, aged from 24 to 39 years (mean 29.6 years), diagnosed in the urology and andrology clinic of the Affiliated Hospital of Shaanxi University of traditional Chinese medicine from October 2018 to October 2021 were selected. All were infertile people who had lived together without contraception for more than 1 year, voluntarily participated in this treatment, and had not received other relevant treatment in recent six months. All patients were excluded from the following factors: the spouse had obvious infertility factors; Abnormal endocrine hormone test; Moderate and severe gonadal infection; Reproductive system malformation or testicular dysplasia; Organic lesions of reproductive organs; Sign informed consent.

2.2 Specimen Collection and Diagnostic Criteria

The subjects were abstinent for 3-5 days, ejaculated by masturbation, collected them for automatic semen analysis and examination, and accurately recorded the total number,

concentration, activity rate and other indexes of sperm; The diagnosis is based on the description of oligozoospermia and asthenospermia in who. Laboratory test manual of human semen and sperm cervical mucus interaction[2].

2.3 Treatment and Observation Indexes

Group A: compound Xuanju capsule (Hangzhou Shiqiang Pharmaceutical Co., Ltd., gyzz z20060462. 2 capsules/time, TID) + levocarnitine (Northeast Pharmaceutical General Factory, gyzz h19990372. 10ml, bid); Group B: compound Xuanju capsule (2 capsules/time, TID); Group C: levocarnitine (10ml, bid); There were 40 cases in each group. Do not take other drugs to treat oligospermia and asthenospermia, and do not have bad behaviors such as smoking and drinking. One month is one course of treatment, and the curative effect is observed after three courses of treatment. The parameters of semen samples before and after treatment were compared by computer-aided analysis (CASA). The levels of plasma testosterone (T), follicle stimulating hormone (FSH), luteinizing hormone (LH), progesterone (P) and prolactin (PRL) before and after treatment were measured by radioimmunoassay.

2.4 Statistical Analysis

The experimental data were collected by spss19 0 software package for statistical analysis, measurement data, and t-test for intra group comparison; Analysis of variance was used for comparison between groups. Chi square test was used for counting data, with P<0.05 as the difference, which was statistically significant.

3. Results

All 120 patients successfully completed the treatment, and there were no obvious adverse reactions during the treatment. After three courses of treatment, the curative effect results of the three groups were compared. It was found that there were significant differences in various parameters of semen quality between group A and group B and C, P<0.05. There was also significant difference in the level of endogenous serum

testosterone after treatment, P<0.05. There was no significant difference between group B and group C (P>0.05). See Table 1 and 2 for details.

Grouping Treatment –	Group A(40 cases)		Group B(40 cases)		Group C(40 cases)		
	Before	After	Before	After	Before	After	
Volume of semen(ml)	1.2±0.4	2.8±0.3ª	1.1±0.5	2.6±0.7a ^b	1.4±0.4	2.5±0.6	
Sperm density(×10 ⁶ /ml)	12.8±5.2	26.4±6.8 ^a	13.4±5.6	22.3 ± 5.9^{ab}	11.9±6.0	21.7±6.2	
Sperm viability(%)	33.5±12.3	59.5 ± 14.7^{a}	33.1±14.2	58.9±13.1 ^{ab}	32.8±12.4	54.5 ± 14.7	
Grade A sperm(%)	12.4±7.2	29.3 ± 10.6^{a}	15.9±8.3	31.1±9.8 ^{ab}	14.3±6.8	30.2±10.4	
Class A and B sperm(%)	31.4±6.2	57.4 ± 7.8^{a}	30.7±6.4	$56.8{\scriptstyle\pm}7.6^{ab}$	31.8±6.7	52.8±5.9	
Note: compared with that before treatment a $n < 0.05$: After treatment compared with group A PD < 0.05							

Note: compared with that before treatment, a p<0.05; After treatment, compared with group A, BP<0.05.

Table 2: Determination results of serum reproductive hormone levels in 3 groups before and a	d after treatment
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Grouping Treatment	Group A(40 cases)		Group B(40 cases)		Group C(40 cases)	
	Before	After	Before	After	Before	After
T(ng/dl)	498.4±92.5	819.4±125.3a	502.5±91.8	788.3±125.4ab	497.1±93	780.9±115ab
FSH(IU/L)	9.3±4.2	8.9±4.5	9.3±4.4	8.9±4.7	9.5±5.3	8.8±5.3
LH(IU/L)	9.8 <u>±</u> 4.3	10.4±2.6	9.6±4.6	10.5±2.5	9.5±4.1	10.6±2.4
P(ng/ml)	0.5±0.3	0.5±0.8	0.5±0.2	0.5±0.3	0.5±0.4	0.5±0.3
PRL(ng/ml)	14.3±4.3	13.5±3.8	13.8±4.5	14.1±3.0	14.1 ±4.8	13.9±3.3

Note: compared with that before treatment, a p < 0.05; After treatment, compared with group A, BP < 0.05. Except testosterone, there was no significant difference between before and after treatment.

4. Discussion

According to relevant classics, traditional Chinese medicine can include oligoasthenospermia in the category of "oligozoospermia", "cold essence" and "thin essence". "Si xuyoufang" sums up the cause of childlessness in reproductive of parents, which shows that men's reproductive function should also be paid attention to, and well-developed sperm is one of the prerequisites for men's fertility. The formation and development of sperm are also affected by various factors. The lack of congenital endowment, such as the atrophy of seminiferous tubules caused by testicular dysplasia, will hinder sperm production; Acquired loss of nutrition, such as decreased semen caused by smoking and drinking; Prolonged illness and loss, such as prostatitis, will indirectly lead to nonliquefaction of semen and form oligoasthenospermia[3]. Traditional Chinese medicine believes that oligoasthenospermia belongs to the category of "kidney deficiency and essence deficiency", so the treatment mainly starts from warming the kidney and essence, tonifying deficiency and benefiting essence.

Compound Xuanju capsule can warm the kidney yang, tonify the kidney deficiency and replenish the essence and Qi. The main drug Xuanju can tonify the kidney and liver, activate blood circulation and remove blood stasis, dispel cold and strengthen yang. It contains a variety of amino acids, trace elements and coenzymes, has obvious anti-inflammatory and anti-aging effects, and is a treasure house for sperm. Osthol is widely found in reproductive organs. It can not only increase the wet weight of testis and epididymis and the content of plasma testosterone, body hormone and luteinizing hormone in serum[4], but also effectively protect sperm cells under oxidative stress[5]. Hormone level is very important for sperm quality. Osthol can play its estrogen like role to regulate pituitary gonadal axis and increase fructose in seminal plasma α - The levels of glucosidase and seminal plasma phosphatase provide energy for sperm, so as to improve sperm survival rate

metabolism[6-7]. promote Lycium barbarum and polysaccharide can reduce the damage of spermatogenic cells caused by high temperature, inhibit cell apoptosis through p53 signal pathway, achieve strong antioxidant effect, promote the normal growth and maturity of testicular spermatogenic cells, and has repair value for spermatogenic system[8]. Icariin, the main chemical component of epimedium, can increase semen secretion and gonadotropin release, accelerate testicular cell proliferation and promote spermatogenesis[9]. It can also promote the development of epididymis and seminal vesicle gland, increase the enzyme containing metal in testis through regulatory protein, improve the production of adrenal steroids, regulate the balance of gonads and promote the synthesis of androgen and testosterone[10]. Moreover, compound Xuanju capsule is warm and good at treating yang deficiency, which can improve erectile dysfunction to a certain extent[11].

L-carnitine is involved in fatty acid metabolism and sperm antioxidant process. It can remove reactive oxygen species (ROS) and free radicals, repair severe oxidative damage, induce sperm movement and promote carnitine in rats β - The transport of oxidation increase spermatogenic cells, makes them arranged orderly, promotes sperm maturation and protects sperm energy metabolism[12-13]. Relevant clinical studies show that after taking L-carnitine, the density and quantity of sperm in patients with oligozoospermia and asthenospermia are increased, and the biggest advantage is that it can improve the motility of forward motile sperm[14]. However, long-term use of L-carnitine alone can lead to anaphylactic shock and mental diseases[15], with great side effects. The dose should be controlled during use.

This study shows that compound Xuanju capsule and levocarnitine oral liquid are effective in improving the sperm quality and serum testosterone content of patients. The clinical efficacy is significantly higher than that of one of the drugs alone, and it is safe and has no obvious adverse reactions. Now that the three child policy is open and the social pressure is

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increasing, it has brought good news to the patients with less and weak sperm.

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