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ORIGINAL RESEARCH

Effect of Donor Sperm on Quality of Life in Patients with Severe Oligoasthenosperm After ICSI Failure

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Objective: To explore the effects of donor sperm on reproductive quality of life, sleep quality and erectile function in patients with severe oligoasthenospermia after the failure of intracytoplasmic sperm injection (ICSI), and to provide targeted reference for intervention.

Methods: From January 2021 to December 2023, patients with severe oligoasthenospermia who received assisted pregnancy treatment in Obstetrics and Gynecology Hospital Affiliated to Tongji University were selected as the study objects. Among them, 82 cases using sperm donor assisted pregnancy after ICSI failure were set as the observation group, and 82 cases using propensity score 1:1 matching ICSI failure after ICSI assisted pregnancy were set as the control group. The levels of serum total testosterone, reproductive quality of life, sleep quality and erectile function of the two groups were compared using the general data questionnaire, FertiQoL, Pittsburgh Sleep Quality Index (PSQI) and International erectile Function Index −5(IIEF-5).

Results: There was no significant difference in social demographic data and serum total testosterone level between the two groups after matching propensity score ($P>0.05$). The total score of FertiQoL and PSQI in the observation group were higher than those in the control group, and the incidence of erectile dysfunction was higher than that in the control group, with statistical significance ($P<0.05$).

Conclusion: The use of donor sperm for pregnancy after ICSI failure in patients with severe oligoasthenospermia has a great impact on their reproductive life, sleep quality and erectile function. Medical staff should pay attention to the quality of life and erectile function of these patients, and formulate targeted measures to help these patients cope positively.

Keywords: severe oligoasthenospermia, supply semen, erectile function, reproductive life quality, sleep quality

In recent years, the incidence of infertility has shown an increasing trend year by year, accounting for 10% to 15% of the population of childbearing age, of which male infertility patients account for about 40%, and 10% to 20% of infertility factors are severe oligoasthenospermia, teratospermia or azoospermia.[1] Intracytoplasmic sperm injection (ICSI) provides a new method for severe oligoasthenosperm patients to assist pregnancy, but some patients will choose to donate sperm after repeated ICSI failed to assist pregnancy. Due to the issue of sperm source, couples who receive sperm donation for assisted conception may experience complex psychological problems, which seriously affect their marital relationship and quality of life.[1] Quality of life is a complex concept, also known as quality of life, which is a comprehensive indicator reflecting the control of disease or treatment-related symptoms in all aspects of a patient's life, including physical function, mental state, social and environmental relationships and independent activity level.[2] Some studies have suggested that infertile men generally have lower quality of life and higher stress levels.[3] Erectile dysfunction (ED) is the most common chronic private disease in male sexual dysfunction. Some studies pointed out[4] that the quality of life of infertile men is related to the physiological dysfunction of patients. Men who receive donor sperm are a special group of infertile men, and they bear greater psychological, social and physiological pressure due to the particularity of sperm source, resulting in lower quality of life. At present, there is little attention to the quality of life of patients with sperm

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donor assisted pregnancy, and fewer studies have been conducted on men who switched to sperm donor assisted pregnancy after ICSI failure. Therefore, this study aims to investigate the differences in fertility pressure, reproductive quality of life, sleep quality, and erectile function between male patients with severe oligoasthenozoospermia who have failed ICSI assisted reproduction more than twice and those who continue to receive ICSI assisted reproduction, and to explore the impact of using sperm assisted reproduction on the quality of life of such patients.

Objects and Methods

Research Object

Convenience sampling method was used to select severe oligozoospermia patients who received assisted reproductive treatment at Tongji University Affiliated Obstetrics and Gynecology Hospital from January 2021 to December 2023 as the research subjects. Among them, patients with severe oligoasthenozoospermia who switched to assisted reproductive technology after ICSI failure were set as the observation group; Patients with severe oligozoospermia who continue to undergo ICSI assisted pregnancy after ICSI failure are designated as the control group. Inclusion criteria: (1) Meets the diagnostic criteria for severe oligoasthenozoospermia in the Chinese Expert Consensus on the Diagnosis and Treatment of Oligozoospermia,[5] it means that the sperm concentration of less than 5×10^6/mL and a progressive motility sperm rate of less than 10%, and received ICSI assisted pregnancy treatment; (2) Prior to ICSI assisted pregnancy, there were no complaints related to sexual dysfunction, and sexual activity was completed normally during natural pregnancy testing; (3) The chromosome detection of both husband and wife is normal; (4) ICSI assisted egg retrieval ≥2 cycles (≥5 eggs per cycle), no pregnancy after transplantation; (5) Sign informed consent. Exclusion criteria: (1) azoospermia; (2) Use frozen sperm, surgical extraction; (3) Combined with major diseases, penile trauma and surgical history; (4) suffering from high blood pressure, diabetes, etc., or suffering from diseases that have significant effects on sexual function when taking drugs for a long time; (5) There are other sexual function problems that affect erectile function, such as low sexual desire. This study was reviewed and approved by the Medical Ethics Committee of Obstetrics and Gynecology Hospital Affiliated to Tongji University (No.: KS2313), and this study complies with the Helsinki Declaration.

Research Methods

Survey Tools

Socio-Demographic Data

Designed by researchers themselves, including age, BMI, occupational status, education level, household registration type, monthly income, whether there are children, whether smoking, whether drinking.

Fertility Problem Inventory (FPI)

Compiled by NEWTON et al[6] in 1999, the scale was used to assess the stress level related to infertility (fertility), including a 46-item self-rating scale with 5 dimensions, such as social pressure, conjugal relationship, parental role needs, childless lifestyle and sexual pressure. The Likert 6-point scale was adopted for scoring, from 1 to 6 points indicating "I disagree" to "I fully agree", among which 18 were reverse questions. The overall score ranges from 46 to 276, with higher scores indicating greater stress associated with infertility (fertility). The scale has good reliability and validity, with Cronbach's α coefficient of 0.93.[6]

Fertility Quality of Life Tool (FertiQoL)

FertiQoL[7] is a self-rating scale developed by the European Society of Human Reproduction and Embryology (ESHRE) and the American Society for Reproductive Medicine (ASRM). Cronbach's α is 0.92. The scale contains 34 items and consists of 2 main modules. The core reproductive life quality module includes four parts: emotional response, physical and mental relationship, marital relationship and social relationship. The reproductive quality of life module of the treatment includes two components: environment and tolerance. Items 4, 11, 14, 15 and 21 of the core module and items 2 and 5 of the treatment modules are scored in reverse. Likert5 (0 ~ 4 points) grade scoring method is used. Both the subscale and the total scale can be converted into 0 ~ 100 points through calculation. The higher the score, the higher the reproductive life quality. The Chinese version of FertiQoL has good reliability and validity.[8]

Pittsburgh Sleep Quality Index (PSQI)

The scale evaluated patients' sleep quality in the past month from seven dimensions (subjective sleep quality, time to fall asleep, sleep duration, sleep efficiency, sleep disorders, use of sleep drugs and daytime dysfunction), with 0 ~ 3 points for each dimension and 0 ~ 21 points in total. The higher the score, the worse the sleep quality. The total score of 8 was divided into two categories: < 8 was considered as normal sleep quality, and ≥8 was classified as sleep disorder.[9] According to the test of PSQI scale, Cronbach's α coefficient is 0.845, and the retest reliability is 0.994, which has good reliability and validity.[10]

International Index of Erectile Function-5 (IIEF-5)[11]

Involving erectile function, penile erection, maintaining erectile confidence, sexual satisfaction of 4 dimensions 5 items, each item according to the patient's feeling degree from low to high 0 ~ 5 points, the total score is 25 points. The reliability and validity of this scale were 0.93 and 0.85 when the total score was more than 22 points. The total score of 12 to 21 was classified as mild ED,8 to 11 as moderate ED, and 5 to 7 as severe ED.

Laboratory Data

Sex Hormone Level

3 mL of fasting venous blood was collected, serum was isolated and obtained, and serum total testosterone level was determined by chemiluminescence method.

Semen Analysis Results

Semen analysis data were collected on the day of the patient's second ICSI assisted pregnancy cycle egg retrieval surgery. Abstinence was performed for 2–7 days before sperm retrieval; semen was collected in a sterile wide-mouth sperm retrieval cup by masturbation method. Including: forward motile sperm rate, inactive sperm rate, normal morphology rate, sperm concentration and semen volume.

Survey Methods

Cross-sectional survey was conducted among the patients who met the exclusion criteria by male specialist nurses.

(1) Questionnaire survey: After obtaining the patient's consent, a male specialist nurse conducted a questionnaire survey on the research subjects. The observation group collected on the day of egg retrieval surgery after switching to sperm donation assisted pregnancy, while the control group collected on the day of egg retrieval during the third cycle of ICSI assisted pregnancy. Using a unified instruction, patients are requested to independently fill out the questionnaire on the spot based on their actual situation and given sufficient time and proper environmental arrangements. After checking for any missing items, the questionnaire will be collected. (2) Laboratory data collection: Retrieve semen, blood, and other examination reports left by the research subjects during the filing process from the hospital medical history system. To ensure the accuracy and completeness of the data, all obtained data are entered into Excel by two people and organized and analyzed.

Statistical Processing

SPSS 26.0 software was used for statistical analysis of relevant data. Measurement data of normal distribution is represented by *t*-test, expressed as mean ± standard deviation (±s). The Mann–Whitney *U*-test is used for non-normally distributed metric data, represented by the medians (interquartile ranges, IQRs); chi-squared test or Fisher test were used for counting data, expressed as frequency (percentage) [n (%)]. The nearest distance method was used to perform 1:1 matching to reduce the bias of observed variables and the influence of confounding factors on the treatment effect. The control difference range was 0.02, and the matching items were occupational status, educational level, monthly income and whether or not they drank alcohol (other baseline data showed no statistically significant differences). $P< 0.05$ indicated that the difference was statistically significant.

Results

Research Object Data Collection Results

A total of 784 questionnaires were distributed to research subjects who met the inclusion and exclusion criteria in this study. Excluding research subjects with incomplete information, missing data, and answer time less than 3 minutes, 743 valid questionnaires were ultimately included, with a valid questionnaire collection rate of 94.77%. Among them, there were 82 patients with severe oligoasthenozoospermia who switched to assisted reproduction after ICSI failure, and 661 patients with severe oligoasthenozoospermia who continued to undergo ICSI assisted reproduction after ICSI failure.

Comparison of Social Demographic Data Between the Two Groups Before and After Matching

Before matching, there were statistical differences in occupational status, age, educational level, monthly income and drinking status between the two groups ($P < 0.05$). The nearest distance method was used for 1:1 matching, and there was no statistical difference in baseline data between the two groups ($P>0.05$). Detailed results are shown in Table 1.

Comparison of Physiological Data Between the Two Groups After Matching

After matching, the serum total testosterone level and semen quality analysis results of the two groups were not statistically significant ($P>0.05$), as shown in Table 2.

Table 2 Comparison of serum total testosterone and semen quality between the two groups after matching [M, (IQRs)].

Table 1 Comparison of Social Demographic Data Between the Two Groups Before and After Matching

Item	Before Matchmaking		$t/x^2/F/Z$	P	After Matchmaking		$t/x^2/F/Z$	P
	Observation Group (n=82)	Control Group (n=661)			Observation Group (n=82)	Control Group (n=82)		
Age (years)	37.50(33.75,42)	34.00(32,38)	4.543	0.000	37.50(33.75,42)	36.00(33.00,40.00)	1.083	0.279
BMI (kg/m^2)	24.00(21.46,26.85)	24.49(22.49,26.59)	−0.916	0.360	24.00(21.46,26.85)	24.43(22.98,26.47)	1.049	0.294
Occupational status			10.785	0.001			0.451	0.502
Be on the job	58 (70.73%)	562 (85.02%)			58 (70.73%)	54 (65.85%)		
On the job	24 (29.27%)	99 (14.98%)			24 (29.27%)	28 (34.15%)		
Educational level			10.185	0.006			0.111	0.946
High school and below	11 (13.41%)	37 (5.60%)			11 (13.41%)	10 (12.20%)		
College/Undergraduate	47 (57.32%)	472 (71.41%)			47 (57.32%)	49 (59.75%)		
Master's degree or above	24 (29.27%)	152 (22.99%)			24 (29.27%)	23 (28.05%)		
Household registration type			0.005	0.945			0.098	0.754
Urban household registration	38 (46.34%)	309 (46.75%)			38 (46.34%)	40 (48.78%)		
Agricultural household registration	44 (53.66%)	352 (53.25%)			44 (53.66%)	42 (51.22%)		
Monthly income (Yuan)			10.211	0.017			1.056	0.788
0~5000	8 (9.76%)	23 (3.48%)			8 (9.76%)	5 (6.10%)		
5001~10,000	21 (25.61%)	132 (19.97%)			21 (25.61%)	24 (29.27%)		
10,000~15,000	33 (40.24%)	348 (52.65%)			33 (40.24%)	35 (42.68%)		
>15,000	20 (24.39%)	158 (23.90%)			20 (24.39%)	18 (21.95%)		
Whether you have children			1.448	0.229			0.877	0.349
Yes	4 (4.88%)	58 (8.77%)			4 (4.88%)	7 (8.54%)		
No	78 (95.12%)	603 (91.23%)			78 (95.12%)	75 (91.46%)		
Smoking			0.072	0.789			0.108	0.742
Yes	38 (46.34%)	296 (44.78%)			38 (46.34%)	36 (48.78%)		
No	44 (53.66%)	365 (55.22%)			44 (53.66%)	46 (51.22%)		
Drinking			8.245	0.004			0.406	0.524
Yes	47 (57.32%)	269 (40.69%)			47 (57.32%)	51 (62.20%)		
No	35 (42.68%)	392 (59.31%)			35 (42.68%)	31 (37.80%)		

Table 2 Comparison of Serum Total Testosterone and Semen Quality Between the Two Groups After Matching [M, (IQRs)]

Item	Number of People	Total Testosterone (ng/mL)	Forward Motility Sperm Rate (%)	Inactive Sperm Rate (%)	Normal Form Rate (%)	Sperm Concentration (10^6/mL)	Semen Volume (mL)
Observation group	82	4.01(3.29,4.63)	25.00(19.75,28.83)	54.45(50.08,61.10)	2.00(2.00,3.00)	8.60(3,93,15.05)	3.30(2.40,4.03)
Control group	82	4.48(3.40,5.87)	24.60(19.33,29.90)	55.00(50.85,60.05)	3.00(2.00,3.00)	10.95(3.59,14.73)	3.15(2.40,4.03)
Z		−1.766	0.030	−0.480	−1.393	−0.133	0.181
P		0.077	0.976	0.631	0.164	0.894	0.856

Comparison of Fertility Pressure Scores Between the Two Groups After Matching

After matching, the total score of FPI in observation group was higher than that in control group, and the difference was statistically significant ($P<0.05$). In all dimensions, there were statistically significant differences ($P<0.05$) between the observation group and the control group in terms of social pressure, marital relationships, parental role demands, and sexual stress. There was no statistically significant difference between the two groups in the dimension of childless lifestyle. ($P>0.05$). See Table 3 for details.

Comparison of Reproductive Quality of Life Scores Between the Two Groups After Matching

After matching, the FertiQoL total score and total core module score of the observation group were lower than those of the control group, and the difference was statistically significant ($P<0.05$), there was no statistically significant difference in the total treatment module score ($P>0.05$). In all dimensions, there were statistically significant differences between the two groups in terms of emotional response, marital relationship, treatment environment, and treatment tolerance ($P<0.05$); while there was no statistical significance in physical and mental relationship and social relationship between the observation group and the control group ($P>0.05$). See Table 4 for details.

Comparison of Pittsburgh Sleep Quality Index Scores Between the Two Groups After Matching

After matching, the total score of PSQI in observation group (12.83±4.96) was higher than that in control group (10.71 ±5.78), with statistical difference (t=2.521, $P<0.05$). In various dimensions, there were statistically significant differences between the two groups in terms of sleep quality, sleep disorders, and daytime dysfunction ($P<0.05$), while there was no statistically significant difference between the two groups in terms of falling asleep time, sleep duration, sleep efficiency, and use of sleep medication ($P>0.05$). See Table 5 for details.

Comparison of Erectile Function Scores Between the Two Groups After Matching

After matching, the total score of IIEF-5 in observation group (16.12±4.27) was lower than that in control group (19.36 ±4.94), with statistical difference (t=−4.493, $P<0.05$). In all dimensions, there was no statistical significance between the observation group and the control group in "confidence in penile erection and maintenance" ($P>0.05$). See Table 6 for details.

Table 3 Comparison of FPI Scores Between the Two Groups After Matching [$\bar{x}$±S]

Item	Number of People	Social Pressure	Husband-wife Relationship	Parental Role Needs	Childless Lifestyle	Sexual Pressure	Total Points
Observation group	82	30.17±6.24	29.99±6.03	36.65±9.71	28.09±10.31	23.12±5.39	148.01±15.34
Control group	82	20.96±4.59	22.70±3.86	25.91±5.41	21.05±5.68	21.28±5.09	111.90±11.57
t		10.759	9.219	8.747	−1.485	−2.313	17.023
P		<0.001	<0.001	<0.001	0.14	0.022	<0.001

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Table 4 Comparison of FertiQoL Scores Between the Two Groups After Matching [$\bar{x}$±S]

Item	Number of People	Emotional Response	Mind-body Relationship	Marital Relationship	Social Relation	Therapeutic Environment	Treatment Tolerance	Total Core Score	Total Treatment Score	Total Points
Observation group	82	58.51±21.24	52.17±22.10	59.66±14.78	62.73±18.14	57.96±11.97	57.61±19.99	58.27±14.38	57.82±12.76	58.14±12.79
Control group	82	65.53±14.00	57.12±21.29	66.09±21.29	66.61±15.20	62.33±12.22	51.65±15.09	63.86±13.46	58.06±10.93	62.15±11.12
t		−2.534	−1.461	−2.749	−1.485	−2.313	2.155	−2.570	−0.129	−2.143
P		0.012	0.146	0.007	0.14	0.022	0.033	0.011	0.897	0.034

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Table 5 Comparison of PSQI Scores Between the Two Groups After Matching [$\bar{x}$±S]

Item	Number of People	Sleep Quality	Sleep Time	Sleep Duration	Sleep Efficiency	Sleep Efficiency	Use of sleep Medication	Diurnal Dysfunction
Observation group	82	2.14±0.89	1.78±1.34	1.63±0.88	1.79±0.86	2.11±0.84	1.04±0.98	2.06±0.77
Control group	82	1.81±1.07	1.56±1.21	1.51±0.86	1.61±0.91	1.74±0.99	1.22±0.73	1.75±0.89
t		2.147	1.103	0.883	1.302	2.581	−1.334	2.385
P		0.033	0.271	0.378	0.195	0.011	0.184	0.018

Table 6 Comparison of IIEF-5 Scores Between the Two Groups After Matching [$\bar{x}$±S]

Item	Observation Group (n=82)	Control Group (n=82)	*t*	*P*
Confidence in the erection and maintenance of an erection	3.82±0.77	4.04±0.96	−1.619	0.107
The frequency with which the penis can be firmly inserted into the vagina after sexual stimulation	3.25±1.32	3.97±0.73	−4.322	<0.001
During sexual intercourse, the frequency of maintaining an erection of the penis after entering the vagina	3.07±0.84	3.54±1.06	−3.147	0.002
During intercourse, the difficulty of maintaining an erection until the end of intercourse	3.34±0.79	3.81±0.96	−3.423	<0.001
The satisfaction of trying to have sex	2.45±0.92	3.09±1.04	−4.174	<0.001

Discussion

Higher Fertility Pressure in Infertile Men Utilizing Sperm Donors Following ICSI Failure

The findings of this investigation revealed that the total Fertility Problem Inventory (FPI) score for the observation group was significantly higher than that of the control group (P<0.05), exceeding the levels reported by Kim et al[12] in their survey of infertile males in South Korea. In terms of the childless lifestyle dimension, no significant differences were noted between the two groups (P>0.05). Men with infertility who resort to donor-assisted pregnancy after the unsuccessful attempt of ICSI represent a distinct subset within the infertile population. Compared to the general population of infertile men, they experience more complex psychological issues,[1] and the increased psychological pressure is inversely proportional to their quality of life.[13] In China, the prevailing pro-fertility culture, coupled with the shift in the approach to assisted conception, introduces numerous challenges, such as the sourcing of donor sperm and the lack of social role recognition. Some individuals link fertility to social role and masculinity, leading to the belief that "the loss of fertility equates to the loss of male prowess", which imposes a profound psychological and emotional burden.[14] These men are particularly concerned about the challenges in fulfilling the paternal role, thereby intensifying their parental role demands and experiencing significant fertility pressure.[15] Moreover, individuals with severe oligoasthenospermia who resort to using donor sperm after multiple ICSI failures must accept offspring unrelated to them, exacerbating their fertility-related stress. Studies have also highlighted that infertile individuals often face barriers in expressing their emotions.[16] The invasion of privacy makes it difficult for infertile men to voice their concerns, thereby obstructing emotional support and hindering effective alleviation of fertility pressure. Future research should prioritize the emotional well-being of infertile men, and clinical management should include personalized plans to address their unique stressors and mitigate fertility pressure. For patients with severe oligoasthenospermia who face immense fertility pressure after ICSI failure, it is imperative to respect their privacy and dignity, offer independent consultations when needed, and provide individualized psychological guidance to bolster their self-confidence.

Lower Reproductive Quality of Life in Infertile Men Using Donor Sperm Post-ICSI Failure

The reproductive quality of life is a critical component of the overall well-being of individuals facing infertility. Impacted by multiple factors, it not only heightens psychological stress but may also lead to marital discord and family instability.[4] Reproductive quality of life has also emerged as a focal point in reproductive medicine research, with a decline often associated with reduced treatment compliance.[2] Asazawa[3] found that infertile men typically exhibit lower reproductive quality of life and higher stress levels compared to fertile men. In this study, the total FertiQoL score for the observation group (58.14±12.79) was significantly lower than that of the control group, with statistical significance ($P<0.05$), slightly below the findings reported by Abulizi[17] for male infertility. Notably, the dimension of the mind-body relationship was most severely affected [(52.17±22.10) points]. Male infertility, predominantly due to sperm-related issues, compounded by the crisis of resorting to sperm donation after ICSI failure, significantly impacts the reproductive quality of life. Patients often undergo various treatments, endure repeated failures, bear substantial medical costs, and face mental pressure from family and society,[18] all while grappling with uncertainty about the treatment process. These factors contribute to heightened psychological stress, adversely affecting reproductive quality of life. Additionally, the physical symptoms and psychological distress associated with ART treatments can greatly influence these patients' fertility-related needs. The loss of confidence in treatment due to repeated failures, coupled with negative emotions such as sadness and disappointment, can significantly reduce the pregnancy rate and diminish the quality of reproductive life.[19] Future studies could benefit from longitudinal designs to monitor the dynamic changes in the reproductive quality of life of infertility patients, develop risk prediction models, identify high-risk factors, and guide caregivers in implementing targeted interventions.

Sleep Quality in Infertile Men Using Donor Sperm Following ICSI

Failure Sleep plays a pivotal role in human reproductive health. A decline in sleep quality has been associated with metabolic syndrome, which is intricately linked to fluctuations in male sex hormones. Men experiencing sleep deprivation often exhibit a significant decrease in testosterone levels or hypogonadism,[20] which can adversely impact reproductive health and overall quality of life. In this study, the Pittsburgh Sleep Quality Index (PSQI) score for the observation group (12.83±4.96) was higher than that of the control group (10.71±5.78), indicating a statistically significant difference ($t=2.521$, $P<0.05$). This group of patients, despite multiple unsuccessful attempts at ICSI-assisted pregnancy, continues to face increasing familial and societal pressures, compounded by repetitive medical assessments and treatment regimens, which heighten their fertility-related stress. Such stress can adversely affect sleep quality.[21] When individuals encounter stressful events, they tend to ruminate on these issues during sleep. Additionally, stress can lead to endocrine disruptions, keeping the body in a state of alertness.[22] Furthermore, anxiety due to excessive preoccupation with concerns before sleep can result in biased cognitions of stressful events,[23] thereby affecting sleep quality from both psychological and physiological perspectives. Poor sleep quality not only impairs the mental state of the body but also significantly affects the work, study, and overall life of infertile men, diminishing their quality of life. Consequently, it is essential for healthcare providers to be attentive to the sleep quality of infertile men, offering comprehensive evaluations and support to both the infertile men and their families, and providing optimal medical care to alleviate the fertility-related stress of men with severe oligoasthenospermia, thereby enhancing sleep quality and improving their quality of life.

Erectile Dysfunction in Infertile Men Following ICSI Failure and Sperm Donor Utilization

In our study, the International Index of Erectile Function-5 (IIEF-5) score for the observation group (16.12±4.27) was significantly lower than that of the control group (19.36±4.94), with a statistical difference ($t=-4.493$, $P<0.05$). Erectile dysfunction (ED) is particularly sensitive to psychological factors in the short term. Patients may experience guilt associated with infertility and sexual dysfunction, which can disrupt the harmony of their sexual relationship and negatively impact their quality of life.[24] Infertile men are often more attuned to sexual issues, and a perceived lack of warmth from their spouse can create additional stress, which in turn affects the marital relationship and perpetuates a cycle of stress.[25] Male patients who understand their infertility often undergo complex emotional changes and experiences that can be more intricate than those experienced by female patients. The traditional concept of sex that equates "sex" with reproductive purpose can blur the line between sexual function and reproductive ability, leading to a belief that a weakening or loss of reproductive ability indicates a decline in sexual function.[26] This view can

significantly impact the gender role identity of both infertile partners and result in psychological burdens. Moreover, societal beliefs that link fertility to masculinity and social roles can lead to sexual pressure,[1] contributing to ED, premature ejaculation, and other sexual dysfunctions, thereby diminishing the quality of sexual and marital life. Therefore, during clinical diagnosis and treatment, it is crucial to identify and address negative thoughts and emotions to improve marital relationships and satisfaction, which can ultimately enhance the overall quality of life.

Suggestion of the Study

Medical personnel should pay attention to the physical and mental health of such patients in the process of clinical diagnosis and treatment and can encourage successful pregnant patients to "reveal themselves", increase the confidence of patients. Multidisciplinary teams can also be formed, in addition to reproductive medicine professionals, psychological counselors and social workers can further play a supportive role, and if necessary, professional support can be provided for their referral to psychotherapists; It can also encourage emotional communication and interaction between couples, face diseases squarely, relieve fertility pressure, and improve quality of life; In addition, clinical workers should provide more educational materials to the families of this population, including the treatment process, challenges to be addressed, and the potential risks and benefits of sperm supply, to help patients make clear decisions.

Limitations of the Study

The sample size of this study is modest, and there is a possibility of sampling bias. In the selection of research subjects, although propensity matching analysis was used to eliminate selection bias, there may be differences in the psychological level of the research subjects, which affects the accuracy of quality-of-life assessment; In addition, this study mainly relied on questionnaire surveys, which may result in recall bias. The results of this study are mainly based on male infertility patients and may not be entirely universal. Therefore, a deeper and more comprehensive understanding of the quality of life and related influencing factors of patients with severe oligozoospermia is needed in the future.

Conclusion

Male infertility patients with severe oligoasthenozoospermia who use donor sperm after ICSI failure have a lower quality of life. It is speculated that the main reason is that the source of sperm causes psychological and physiological distress to this population, leading to a decrease in their quality of life. This is mainly manifested in increased fertility pressure, decreased quality of life, poorer sleep quality, and erectile dysfunction. Clinical medical staff should pay attention to the quality of life of this group of people, identify and actively intervene in a timely manner, and help them improve their quality of life and achieve successful pregnancy assistance as soon as possible.

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Disclosure

Ke Wang and Yan Xu are co-first authors for this study. The authors report no conflicts of interest in this work.

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