

CASE REPORT

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Integrating yoga as a holistic intervention in male infertility management: improved sperm parameters and stress reduction: a case report

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Abstract

Background Male infertility, particularly severe oligozoospermia, presents a significant challenge in reproductive health, often associated with high oxidative stress and poor lifestyle practices. This case report highlights the potential therapeutic role of a structured yoga regimen in improving semen quality, reducing stress, and enhancing quality of life in a male with long-standing infertility. The novelty lies in documenting comprehensive improvements across semen parameters and psychological well-being following a nonpharmacological intervention.

Case presentation A 30-year-old Indian male diagnosed with severe oligozoospermia presented with a four-year history of primary infertility. His 30-year-old Indian female partner had no identifiable reproductive abnormalities. The couple sought consultation at a tertiary care centre. The male patient reported a high-stress lifestyle due to his occupation as an architectural researcher involving extensive travel and irregular routines. He underwent a six-month structured yoga intervention (five days per week) comprising guided sessions involving breathing exercises, meditation, and specific physical postures, supervised by a certified yoga therapist. Pre- and post-intervention assessments included semen analysis, sperm DNA integrity, oxidative stress markers in seminal fluid, and quality of life using a standardized assessment tool. Post-intervention, the patient exhibited notable improvements in semen parameters, including increased sperm count and motility, reduced morphological abnormalities, and decreased seminal oxidative stress levels leading to sperm DNA fragmentation index decline. Improvements were also observed in quality-of-life scores across physical, psychological, social, and environmental domains. Following these outcomes, intrauterine insemination was advised as a fertility treatment option.

Conclusions This case illustrates the potential of yoga as an adjunctive, noninvasive therapy for managing male infertility, particularly in individuals with stress-related reproductive dysfunction. The structured yoga program led to substantial improvement in semen quality and quality of life, suggesting a mind–body connection that may influence reproductive health. This single case provides preliminary insight into the potential link between lifestyle factors and reproductive health, though broader studies are required. Further studies involving larger cohorts are needed to validate and expand upon these promising results.

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Keywords Yoga intervention, Male factor infertility, Lifestyle choices, Adjunct therapy

Background

Infertility affects approximately 15% of couples worldwide, with male factors contributing to nearly half of these cases. Male infertility can arise from various causes, including abnormal sperm function, sub-optimal sperm quality, or physical obstructions that hinder sperm delivery. Conditions such as severe oligozoospermia, oligoasthenoatozoospermia (OATs), and azoospermia are frequently diagnosed in infertile men. Male infertility may also be influenced by a range of factors, such as chronic health conditions, lifestyle choices, injuries, and hormonal imbalances. Modern lifestyle factors that includes smoking, poor dietary habits, and lack of physical activity are associated with the production of reactive oxygen species (ROS), leading to increased inflammation, oxidative stress, and consequent DNA damage in sperm cells [1]. Oxidative stress and DNA damage play critical roles in altering reproductive hormones in both men and women by either promoting ROS production or reducing total antioxidant capacity (TAC) [2]. The conventional treatments for idiopathic or stress-related infertility are often invasive, expensive, and insufficiently address underlying psychosocial and oxidative stress-related contributors. An adjunct therapy such as yoga is needed because it is low-risk, accessible, and targets stress regulation and oxidative balance, key modifiable determinants of male reproductive health [3].

Yoga, widely recognized for its benefits on overall well-being, holds promise for enhancing reproductive health by reducing stress, improving blood circulation, and promoting hormonal balance [4]. Factors influencing sperm quality such as sperm count, motility, and morphology are multifactorial, involving genetics, lifestyle, diet, and general health [5]. Although stress reduction, lifestyle modification, and regular physical activity benefit reproductive health, the impact of specific yoga practices on male fertility remains a nuanced area of study, as these benefits may result from a combination of lifestyle factors rather than individual poses alone. Alternative and complementary therapies, such as yoga, have gained attention for their potential to improve male reproductive health by reducing stress, balancing hormones, and promoting psychological and physical well-being [6]. Meditation, an integral component of yoga, facilitates deep relaxation and enhances mental and physical health by inducing a state of conscious relaxation with sustained awareness [7]. This case study investigates the effects of integrating yoga

into the daily routine of an infertile male with sub-optimal semen parameters, exploring yoga's potential role in improving both physiological and psychological aspects of male fertility.

Case presentation

Couple-specific information

The subjects of this investigation are a 30-year-old Indian male and his 30-year-old Indian female spouse, who sought consultation at the Andrology clinic at AIIMS, New Delhi, India, after unsuccessfully attempting to conceive for over four years. A written informed consent was obtained from the patient and his partner for the publication of this case report and their personal medical information. The male partner is a nonsmoker, nonalcoholic, and has no history of diabetes, hypertension, or any other comorbid conditions. His hormone profile, including follicle-stimulating hormone (FSH), luteinizing hormone (LH), and testosterone levels, were within normal ranges. He follows a vegetarian diet and maintains a regular lifestyle, with no long-term medication use.

For the female partner, blood serum levels of LH, FSH, progesterone, and anti-Müllerian hormone (AMH) were also within normal limits. An ultrasonography of her lower abdomen showed a few minor ovarian cysts, but her hormone profile was normal, and she had no history of surgical interventions. The male partner's body mass index (BMI) was 25 kg/m², while the female partner's BMI was 23.1 kg/m², both indicating a normal body stature.

Clinical findings and diagnosis

The couple was diagnosed with primary infertility due to male factors. The male partner's semen analysis revealed compromised fertility, with poor semen parameters including a low total sperm count of 10 million per ejaculate, reduced progressive motility at 20%, and a high prevalence of morphological abnormalities, with 91% of sperm showing head defects such as premature, amorphous, and pyriform heads. Based on these clinical findings, he was diagnosed with severe oligozoospermia, evidenced by a low sperm concentration of 4 million/mL, poor progressive motility (20%), and only 1–2% morphologically normal sperm (Table 1, Supplementary Fig. 1). These issues were attributed to elevated stress levels and emotional distress related to infertility and societal pressures.

Table 1 Semen analysis pre and post yoga intervention as per WHO guidelines

Parameters	Pre- yoga (T = 0 Month)	Post- yoga (T = 6 Month)	Normal range (WHO,2021)
Volume (mL)	2.5	3.5	≥ 1.4 mL
pH	8	8	> 7.2
Viscosity (Normal/ Abnormal)	N (Liquified)	N (Liquified)	Small discrete drops
Liquefaction time (min)	≥ 30 min	≥ 30 min	≥ 30 min
Sperm concentration (million/ml)	4	59	≥ 15 million/ml
Total sperm count (million/ejaculation)	10	207	≥ 39 million/ejaculation
Total motility (%)	50%	72%	≥ 42%
i. Progressive	20%	49%	≥ 30%
ii. Nonprogressive	30%	23%	-
iii. Nonmotile	50%	28%	-
Sperm morphology (% of normal forms)	1–2%	5–6%	≥ 4%
Head defects	91% (Amorphous Head, Pyriform)	50% (Amorphous Head, Pyriform)	-
Mid piece defects	5%	29%	-
Tail defects	2%	15%	-
Round cells	< 1 million/ml	< 1 million/ml	< 1 million/ml
Remarks	Not suitable for IVF, low sperm conc. & poor morphology	Suitable for IVF	-

Treatment and outcome

The male partner participated in an ongoing yoga program offered by the Anatomy Department at AIIMS, New Delhi, which involved a one-hour yoga regimen, five days a week, under the guidance of trained yoga therapists. Also, did not exhibit any baseline limitations in flexibility or fitness and was able to perform all prescribed asanas without difficulty. Regular physical activity, stress-relief techniques, and healthy lifestyle practices are known to support reproductive health and improve sperm quality, thereby enhancing overall quality of life. This yoga intervention was specifically designed to improve blood circulation to the reproductive organs, incorporating poses

that focused on the pelvic region. To promote stress relief and a strong mind–body connection, each class ended with counseling sessions and guided meditation for deep relaxation. The intervention continued for six months, with a structured one-hour yoga module outlined in Table 2. There was strict inclusion criterion that there was no change in lifestyle pre & post yoga intervention was made. This included maintaining consistency in diet, sleep patterns, and physical activity (excluding the yoga intervention), with no use of supplements or medications throughout the six-month duration.

Semen samples were collected at baseline $T=0$ (Pre-yoga) and and after six months of intervention,

Table 2 Module for yoga intervention

S No	Yoga module		Duration (total: 60 min)
1	Session preparation instruction and prayer		5 min
2	Yogic sukshma vyam and	Finger, Wrist, Elbow, & Shoulder Loosening, Toe, Ankle & Knee Bending	5 min
3	Yogasna	Standing	Trikonasana, Katichakrasana, Tadasana, Veerbhadrasana
		Sitting	Gomukhasana, Paschimutanasana, Shashaankasana, vakrasana,
		Prone	Ek-pada-shalabhasana, Bhujangasana, Poorna-shalabhasana, Pavan-muktanasan
		Supine	Uttanapadasana, Setubhandhasana, Pavamuktasana, Matsyasana
4	Relaxation, Pranayama, Dhyana		Savasana, Kapalbhathi, Ujjiyayi, Bhramari

$T=6$ months (post-yoga), with two collections per time point taken one week apart following 2–4 days of abstinence, for ROS and DNA fragmentation index (DFI) analysis. Semen analysis followed WHO 2021 guidelines, with ROS and DFI levels measured at both time points. Quality of life was assessed using the World Health Organization Quality of Life—BREF version (WHOQOL-BREF) questionnaire, which evaluates four domains: physical, psychological, social, and environmental well-being. Post-intervention, participants experienced significant improvements in quality of life, with enhanced sleep quality, reduced anxiety, and increased relaxation observed early in the intervention. WHOQOL-BREF scores showed marked increases across all domains: physical health improved from 17.85 to 78.5, psychological health from 16.6 to 70.8, social relations from 16.6 to 91.6, and environmental well-being from 25 to 65.6, indicating substantial gains in overall well-being (Table 3). Additionally, the subject experienced increased energy and enthusiasm for life, while the couple reported a decrease in overall stress and a strengthened emotional connection. Semen analysis results showed significant improvements in parameters: total sperm count rose dramatically from 10 million/ejaculate to 207 million/ejaculate, and progressive motility increased from 20 to 49%, reflecting enhanced sperm movement. Morphology also improved from $<2\%$ to $>6\%$ due to reduced head abnormalities in sperm (Supplementary Fig. 2 and 3 respectively).

Seminal ROS levels decreased significantly from 39.6 ± 0.77 to 21.5 ± 0.42 RLU/s/million sperm following the six-month yoga intervention (Fig. 1), accompanied by a reduction in sperm DFI from $32.9 \pm 0.77\%$ to $27.7 \pm 0.84\%$ (Fig. 2). Overall, most seminal parameters approached the reference range. A detailed comparison of semen analysis results before and after the yoga intervention is provided in Table 1. Hormonal profile values, including FSH, LH, and testosterone, remained within normal ranges, with pre- and post-yoga values given in Table 4. To rule out genetic causes, we performed

Table 3 Scores of the WHOQOL-BREF questionnaire across four domains demonstrating changes in quality of life following the intervention. (The domain scores are converted into a scale from 0 to 100)

Assessment domains	Pre-yoga (T=0 Month)	Post-yoga (T=6 Month)
Physical health	17.85	78.57
Psychological health	16.6	70.8
Social relations	16.6	91.6
Environment	25	65.6

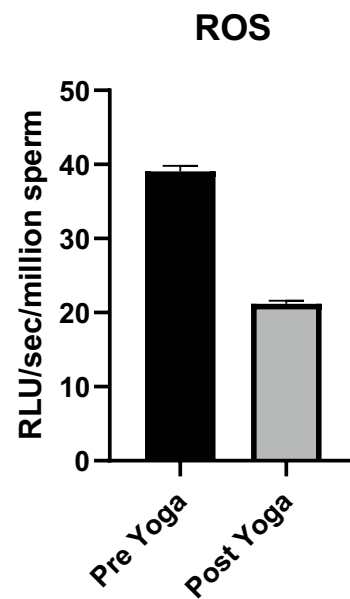


Fig. 1 Seminal ROS levels before and after the six-month yoga intervention. The bar graph shows a significant reduction in ROS from 39.6 ± 0.77 RLU/million sperm at baseline (pre-yoga) to 21.5 ± 0.42 RLU/million sperm post-yoga, indicating improved oxidative stress status and enhanced seminal health

Y-chromosome microdeletion analysis, which showed no deletions in the AZF a (sY84, sY86), AZF b (sY127, sY134), or AZF c (sY254, sY255) regions (Supplementary

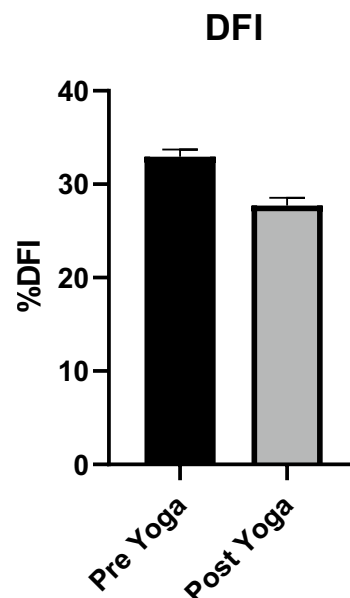


Fig. 2 Sperm DNA fragmentation index (DFI) before and after the six-month yoga intervention. The bar graph illustrates a decrease in DFI from $32.9 \pm 0.77\%$ at baseline (pre-yoga) to $27.7 \pm 0.84\%$ post-yoga, reflecting improved sperm genomic integrity and reduced oxidative damage

Table 4 Hormone profile of the male partner

Hormone	Pre-yoga (T = 0 Month)	Post yoga (T = 6 Month)	Normal range (Adult male)
Testosterone (nmol/L)	22	29	10–35
FSH (mIU/mL)	5.7	6.3	1.5 – 12.4
LH (mIU/mL)	3.4	2.6	1.7–8.6

Fig. 4). These findings indicate the absence of common genetic abnormalities associated with severe oligozoospermia, supporting a nongenetic etiology in this case.

Discussion and conclusions

This case study highlights a significant improvement in semen quality following a six-month structured yoga intervention. Specifically, total sperm count increased to 207 million per ejaculation, Total motility rose to 72%, and normal morphology reached 6%. Additionally, levels of seminal ROS and sperm DFI have decreased. These findings suggest that yoga may enhance sperm functionality and production by improving blood circulation to the reproductive organs and alleviating the adverse effects of chronic stress, which can negatively impact fertility [3, 8].

The potential mechanisms through which yoga influences sperm parameters are multifaceted. Various yoga asanas, such as Bhujangasana, Baddha Konasana, and Salamba Sarvangasana, have been shown to improve blood flow to the reproductive organs, which is essential for enhanced sperm production and overall reproductive health [9, 10]. Furthermore, chronic stress has been associated with negative impacts on semen quality, and practices such as meditation may help mitigate these effects, thereby improving sperm parameters [3].

In this case, the male partner, a 30-year-old with a normal BMI (23.1), had been diagnosed with severe oligozoospermia, characterized by low sperm concentration (4 million/mL), poor progressive motility (20%), and less than 2% normal morphology. After undergoing a structured yoga intervention that included asanas, suksma-vyayam, pranayama, and meditation under the guidance of trained yoga therapists, substantial improvements were observed. The patient demonstrated consistent adherence to the structured yoga module, which remained unchanged throughout the 6-month intervention, with no progression or modification introduced over time post-intervention, sperm concentration increased to 59 million/mL, progressive motility improved to 49%, and the percentage of morphologically normal sperm exceeded 6%. These results corroborate findings from similar case studies, where notable enhancements in sperm quality were reported after yoga interventions

[11, 12]. In addition to the improvements in seminal parameters, reductions in seminal ROS levels and a slight decrease in sperm DFI were observed, suggesting a potential correlation between yoga practice and enhancements in male reproductive health. Previous studies have similarly documented reductions in oxidative stress markers following yoga-based lifestyle interventions, reinforcing the notion that yoga can positively influence semen quality [13, 14]. The WHOQOL-BREF results indicate significant improvements in all four domains of quality of life physical health, psychological well-being, social relationships, and environmental factors demonstrating an overall enhancement in participants' well-being. Similar benefits have been reported in other populations, including male partners of couples experiencing early pregnancy loss [15]

Moreover, holistic approaches that incorporate yoga and meditation have shown promise in enhancing reproductive outcomes by natural conception and assisted reproductive technology (ART) [16, 17]. The combination of physical postures, breathing exercises, and mindfulness practices inherent in yoga may lead to improved blood flow to reproductive organs and reduced oxidative stress, thereby enhancing semen characteristics and hormonal balance [3]. Despite these promising results, there remains a lack of research evidence for evaluating the direct effects of yoga and meditation on semen quality. However, several studies have indicated correlations between consistent yoga practice and improved semen parameters, particularly in maintaining redox status and DNA integrity in sperm [15]. Poor lifestyle behaviors, including excessive smoking, alcohol consumption, irregular sleep, and a low-fiber diet, are known to contribute to oxidative stress and subsequent sperm DNA fragmentation [18, 19]. Yoga has been shown to mitigate oxidative stress and improve DNA integrity in sperm cells [20]. Given these findings, integrating yoga into daily routines as an adjunct therapy for this single patient with suboptimal semen quality appeared beneficial. Although the improvements in semen parameters and quality-of-life measures observed in this patient are notable, several limitations must be acknowledged. Being a single case report ($n=1$), statistical analyses could not be performed, and the observed changes should be interpreted as descriptive evidence rather than conclusive findings. Men with severe sperm abnormalities may still require conventional medical interventions, such as assisted reproductive techniques (ART), to achieve conception. Future research should focus on well-designed randomized controlled trials with larger cohorts to systematically evaluate the efficacy of yoga and meditation as adjunctive interventions for male

infertility. Until such evidence is available, couples seeking to improve fertility should consult healthcare professionals for individualized management plans that integrate conventional therapies with supportive holistic practices such as yoga.

In conclusion, this case demonstrates that structured yoga and meditation interventions may improve various factors include ROS, DFI, seminal parameter and sperm quality in infertile male. As an adjunct therapy like yoga which is cost effective, noninvasive and nonpharmacological intervention, it may be useful with standard care for infertility treatment.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s13256-026-06270-x>.

Supplementary Material 1.

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Author contributions

Conceptualization: RD and PT; Subject recruitment, methodology and experimental executions and data analysis: AY, PT, RM, RK and RD; Writing—original draft preparation: AY, PT, RK, RM and RD; Writing—review and editing: AY, PT, RM, RK and RD. All authors have read and approved the final version of the manuscript for publication.

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Data availability

All data used and/or analyzed during the current study are available from the either first author and/or corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

Ethical approval for the study was obtained from the Institutional Ethics Committee (Reference no. IECPG-676/25.11.2021).

Consent for publication

Written informed consent was obtained from the patients for publication of this case report and any accompanying images. Copies of the written consent are available for review by the Editor-in-Chief of this journal.

Competing interests

The authors declare that they have no competing interests related to this study.

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