Immunology Research and Immunotherapy

ISSN: 3068-5281

ScitechJournals

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Assessment of Stressors Affecting Seminal Quality in Indian Men Prior to Conception

Abstract

Background: Psychological, occupational, and lifestyle-related stressors are increasingly recognized as important determinants of male reproductive health. Chronic stress can disrupt the hypothalamic–pituitary gonadal axis, increase oxidative stress, and impair spermatogenesis. In India, rapid socio-economic changes have amplified exposure to stress, yet experimental evidence on its impact on seminal quality prior to conception remains limited.

Objective: To experimentally assess the effect of selected stressors on seminal quality parameters in Indian men prior to conception.

Methods: A controlled experimental study was conducted among Indian men of reproductive age. Participants were categorized into low-stress and high-stress groups based on validated stress assessment scales. Seminal parameters were analyzed according to WHO guidelines and compared between groups.

Results: Men exposed to high levels of psychological and occupational stress exhibited significantly reduced sperm concentration, motility, and normal morphology compared to low-stress counterparts ($p < 0.05$). Stress biomarkers correlated negatively with seminal quality.

Conclusion: Exposure to chronic stressors significantly compromises seminal quality in Indian men prior to conception. Stress management interventions should be integrated into pre-conception male reproductive health programs.

Keywords

Stressors, seminal quality, sperm parameters, male fertility, pre-conception health, Indian men.

Research Article

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Received: 29 Jan, 2026; **Accepted:** 18 Feb, 2026; **Published:** 24 Feb, 2026

Introduction

Male fertility is influenced by a complex interaction of biological, environmental, and psychosocial factors. Seminal quality assessed through sperm concentration, motility, morphology, and semen volume is a primary indicator of male reproductive potential. While environmental toxins and lifestyle factors have been extensively studied, psychosocial stress remains an underexplored yet significant contributor to male infertility. Stress activates neuroendocrine pathways that suppress gonadotropin secretion, reduce testosterone levels, and increase reactive oxygen species production (1,2). In India, increasing occupational demands, urban stress, financial pressures, and altered sleep patterns may negatively influence male reproductive health even before conception is attempted.

This experimental study evaluates the impact of stressors on seminal quality in Indian men prior to conception.

Materials and Methods

Study Design

A comparative experimental study conducted over six months at a tertiary care reproductive health center.

Participants

Sample size: 140 Indian men (ages 22–45 years). Inclusion criteria: Men planning conception within one

year. Exclusion criteria: Known infertility, chronic illness, hormonal disorders, reproductive tract infections, substance abuse.

Assessment of Stressors

Stress exposure was evaluated using (3,4):

Perceived Stress Scale (PSS-10). Occupational Stress Index (3,4). Sleep Quality Index (PSQI).

Participants were grouped as:

Low-stress group (n = 70). High-stress group (n = 70)

Semen Collection and Analysis

Semen samples were collected after 2–7 days of abstinence and analyzed within one hour following WHO 6th edition guidelines.

Parameters measured:

Semen volume (mL). Sperm concentration (million/ mL). Total motility (%). Progressive motility (%). Normal morphology (%)

Stress Biomarkers (Optional Experimental Component) (5)

Serum cortisol. Serum testosterone

Statistical Analysis

Data were analyzed using SPSS. Independent t-test and Pearson correlation were applied. Significance was set at $p < 0.05$.

Results

Comparison of Seminal Parameters

Hormonal Findings

Elevated cortisol levels were observed in the high-stress group. Testosterone levels showed a significant inverse correlation with perceived stress scores ($r = –0.46$) (5).

Discussion

This experimental study demonstrates that chronic exposure to stressors significantly impairs seminal quality in Indian men prior to conception. Reduced sperm concentration and motility in the high-stress group may result from neuroendocrine suppression of spermatogenesis and increased oxidative damage. The findings align with international studies linking stress to reduced sperm motility and increased abnormal morphology. Given that stress is a modifiable factor, early identification and intervention may improve fertility outcomes.

Conclusion

Stressors exert a significant negative effect on seminal quality in Indian men prior to conception. Integrating psychological assessment, stress reduction strategies, and lifestyle counseling into pre-conception care may enhance male fertility potential.

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Citation: Rahul Hajare. “Assessment of Stressors Affecting Seminal Quality in Indian Men Prior to Conception.” Immunol Res Immunother (2026):106. DOI: 10.59462/3068-5281.2.1.106