

Prevalence of Male Factor Infertility in Last Ten Years at a Rural Tertiary Care Centre of Central India: A Retrospective Analysis

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ABSTRACT

Background: Male infertility accounts for 40-50% of infertility, affects 7% of all men. It is commonly due to deficiencies in semen, and semen quality is used as measure of male fecundity.

Objective: To retrospectively study profile of male factor infertility, especially abnormal semen parameters in rural area of Central India over a period of 10 years and to find out prevalence of various abnormalities of sperm and sperm counts and also to know yearly variation in prevalence of such abnormalities.

Material and Methods: A Retrospective analysis of 10 years was carried out at the Department of Obstetrics and Gynecology and Reproductive Biology Unit of Department of Physiology of a rural tertiary care centre of Central India from January 2005 to December 2014. The case records of total of 3084 male partners of infertile couples consulting the Gynecology Out Patient Department were collected from the Reproductive Biology Unit of Department of Physiology. On the basis of semen analysis report the cases were categorized into four groups; Normozoospermia, Oligozoospermia, Azoospermia and Asthenoteratozoospermia. The results were analyzed using SPSS software.

Results: Out of total 3084 semen analysis reports of infertile couples, Normozoospermia was observed in 1104 (35.80%), Oligozoospermia in 1053 (34.14%), Asthenoteratozoospermia in 597 (19.35%) and Azoospermia in 330 (10.70%).

Conclusion: Semen analysis is cornerstone for evaluation of infertility in men. It gives an idea about abnormalities of sperm and sperm count. Present study revealed no significant rise in prevalence of male infertility over last 10 years in this region of India.

Key words: Fertility; Infertility; Normozoospermia; Semen analysis, Sperm.

INTRODUCTION

According to International Committee for Monitoring Assisted Reproductive Technology and World Health Organization, infertility is disease of reproductive system defined by failure to achieve clinical pregnancy after 12 months or more of regular unprotected sexual intercourse¹. There are no reliable figures for global prevalence of infertility², but estimates suggest that nearly 72.4 million couples globally experience fertility problems³. As per the WHO estimates 60–80 million couples (8-12%)^{4,5} worldwide currently suffer from infertility⁶. It tends to be highest in countries with high fertility rates, an occurrence termed “barrenness amid plenty”⁷. According to National Center for Health Statistics, 2013 the absolute numbers of impaired fecundity in United States increased by about 2.7 million women, from 4.56 million in 1982 to 7.26 million in 2002, then fell slightly to 6.71 million in 2006–2010⁸. Moreover the fertility rate in men younger than age 30 years has also decreased worldwide by 15%⁹.

In India according to WHO the overall prevalence of primary infertility ranges between 3.9% and 16.8%⁶. Also the estimates of infertility vary widely among Indian states from 3.7% in Uttar Pradesh, Himachal Pradesh and Maharashtra¹⁰, to 5% in Andhra Pradesh¹¹, and 15% in Kashmir¹².

It was reported that 40% of infertility cases were related to men, 40% to women and 20% to both sexes¹³. According to a multicentric study conducted by WHO from 1982–1985, 20% of cases were attributed to male factors, 38% to female factors, 27% had causal factors identified in both partners, and 15% could not be satisfactorily attributed to either partner¹⁴. A recent report on the status of infertility in India, states that nearly 50% of infertility is related to reproductive anomalies or disorders in the male¹⁵. ‘Male factor’ infertility is seen as an alteration in sperm concentration and/or motility and/or morphology in at least one sample of two sperm analyses, collected between 1 and 4 weeks apart¹⁶. In humans it accounts for 40-50% of infertility¹⁷⁻¹⁹ and affects approximately 7% of all men²⁰. Males with sperm parameters below the WHO normal values are considered to have male factor infertility²¹. The most significant of these are a low sperm concentration (oligozoospermia), poor sperm motility (asthenozoospermia), and abnormal sperm morphology (teratozoospermia).

Semen analysis remains the single most useful and fundamental investigation with a sensitivity of 89.6%, that it is able to detect 9 out of 10 men with a genuine problem of male infertility²². Although this assay reveals useful information for the

initial evaluation of the infertile male, it is not a test of fertility²³.

The present retrospective study aimed at finding the prevalence of abnormalities of sperm and sperm count in a rural infertile population of Central India over a period of last ten years and to know the yearly trends in such abnormalities of seminal parameters.

MATERIAL AND METHODS

The study comprised of retrospective analysis of case records of male partners of infertile couples over a period of 10 years from January 2005 to December 2014 in the Department of Obstetrics and Gynecology and Reproductive Biology Unit of Department of Physiology of a rural tertiary care centre of Central India. For Retrospective analysis the information was collected from the records of Reproductive Biology Unit of Department of Physiology after ethical clearance from the Institutional Ethical Committee. All attempts were made not to disclose the identity of any of the patients. Finally on the basis of semen analysis report the cases were categorized into four groups, that is Normozoospermia, Oligozoospermia, Azoospermia and Asthenoteratozoospermia. The results were then analyzed and compiled using SPSS software version 20.0. SPSS Statistics is a software package used for statistical analysis. Statistics included in the base software are Descriptive statistics (Cross tabulation,

Frequencies, Descriptives, Explore, Descriptive Ratio Statistics), Bivariate statistics (Means, t-test, ANOVA, Correlation, Nonparametric tests), Prediction for numerical outcomes (Linear regression), Prediction for identifying groups (Factor analysis, cluster analysis, Discriminant).

The following operational definitions were used: Normozoospermia: Sperm count >15 million/ml to 120 million/ml; Oligozoospermia: Sperm count below 15 million/ml; Azoospermia: Absence of spermatozoa in the ejaculation; Asthenoteratozoospermia: Those having < 30% motility with > 60% abnormal forms.

RESULTS

Of total 3084 semen analysis reports of male partner of infertile couples analyzed over a period of 10 years, 1104 (35.80%) had normozoospermia, 1053 (34.14%) had Oligozoospermia, 597 (19.35%) Asthenoteratozoospermia and 330 (10.70%) Azoospermia, as depicted in Table 1. Oligozoospermia and Asthenoteratozoospermia were the major abnormal parameters recorded as shown in Figure 1. Yearly trend in male factor infertility was also observed and it was found that the trend of various sperm abnormalities remained almost constant throughout ten years except for asthenoteratozoospermia which showed a slight increased rate over last 10 years as depicted in Figure 2.

Table 1: Distribution of Cases According To Semen Analysis Report

Year	Normozoospermia (%)	Oligozoospermia (%)	Asthenoteratozoospermia (%)	Azoospermia (%)	Total
2005	111 (39.92)	93 (33.45)	36 (12.94)	38 (13.67)	278
2006	121 (44.98)	102 (37.92)	17 (6.32)	29 (10.78)	269
2007	125 (33.42)	146(39.04)	59(15.77)	44 (11.76)	374
2008	129 (41.21)	102 (32.59)	50 (15.97)	32 (10.22)	313
2009	106 (38.40)	81(29.35)	59 (21.37)	30 (10.87)	276
2010	94 (32.08)	110 (37.54)	57 (19.45)	32 (10.92)	293
2011	94 (31.33)	99 (33.0)	65 (21.67)	42 (14.0)	300
2012	113 (33.83)	129 (38.62)	59 (17.66)	33 (9.88)	334
2013	106 (32.72)	110 (33.95)	82 (25.31)	26 (8.02)	324
2014	105 (32.51)	81(25.08)	113(34.98)	24 (7.43)	323
Total	1104 (35.80)	1053 (34.14)	597(19.35)	330 (10.70)	3084

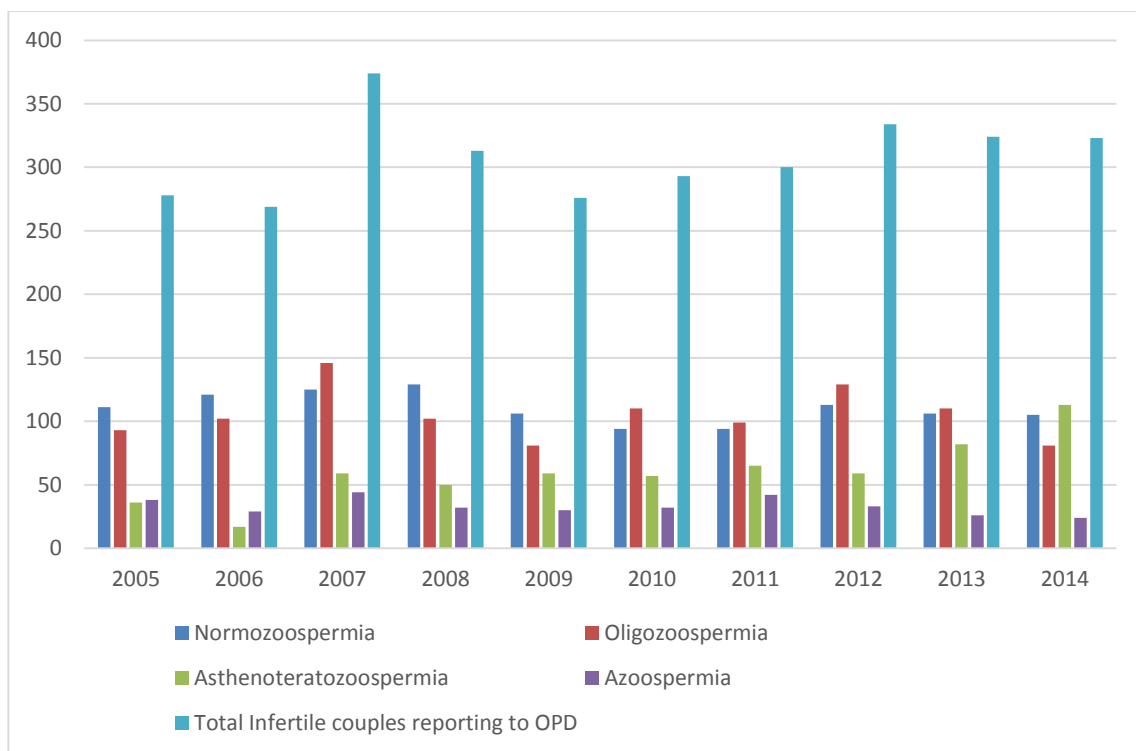


Figure 1: Graphical Representation of Year-Wise Semen Analysis Report

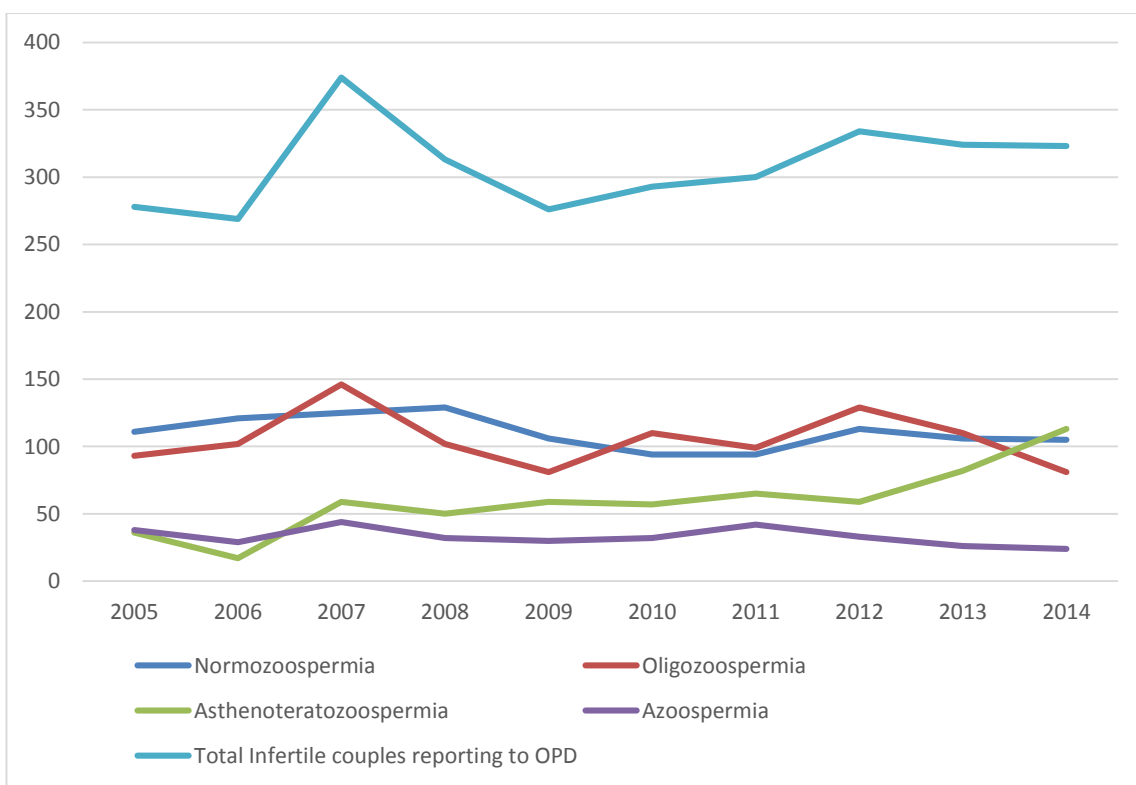


Figure 2: Yearly Trend of Semen Analysis Report in Last Ten Years (2005-2014)

DISCUSSION

For infertility females are always blamed, but advancing knowledge proves males as an equal contributor to this problem. It results in much trauma, emotional instability and psychological stress, which in turn has an adverse bearing on the physiology and psychology of the individual, particularly in a social set-up such as ours, with a strong emphasis on child-bearing. Screening of males by semen analysis provides some insight about the underlying pathological problems occurring in the male genital tract. In our study it was found that of total 3084 cases 1104 (35.80%) males had normal sperm count and rest 1980 (64.20%) males had abnormal semen analysis report. This is similar to a study done in 2012 which reported the incidence of male infertility as 62%²⁴. The reported prevalence of oligozoospermic, azoospermic and asthenoteratozoospermic in cases of primary infertility in same study was 33.17%, 9.89% and 1.08% respectively²⁴, which were similar to our study results. The prevalence of azoospermia in our study population was 10.70%, and of oligozoospermia 34.14% respectively. The results are comparable to study which reported the prevalence of azoospermia as 14.28% and that of oligozoospermia 21.43%²⁵. In many studies, the reported incidence of azoospermia ranges between 12.32% to 16%²⁶⁻²⁸. Another study revealed the prevalence of azoospermia and oligozoospermia to be around 33%²⁹. According to a study in Pakistan the reported incidence of azoospermia and oligozoospermia is 14% and 37% respectively, which is comparable to our study²⁶. A study reported the incidence of Asthenoteratozoospermia as 1.08%²⁴. Other studies reported the prevalence of oligoasthenoteratospermia as 9.09%²⁸ and 11%³⁰ respectively. In our study the prevalence of asthenoteratozoospermia was slightly high, that is around 19.35% and it showed an increasing trend over the last 10 years.

Hence, the present study revealed that the overall trend of male infertility remained almost constant throughout the last ten years, with only slight rising trend of asthenoteratozoospermia.

CONCLUSION

Semen analysis remains the single most useful and fundamental investigation for male infertility. Though it not a test of fertility, but it does provide information about abnormalities of sperm count and morphology. As per the present study the male factor infertility is not showing an alarming rise in this region of India.

Conflicts of Interest: There are no conflicts of interest

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