

# Evaluating the Prevalence of Male Infertility in Karachi

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## ABSTRACT

**Objective:** To analyze the prevalence of male infertility in Karachi.

**Study Design:** Descriptive case series

**Place and Duration of Study:** This study was conducted at the Civil Hospital, Karachi from 1<sup>st</sup> January 2015 to 31<sup>st</sup> December 2015.

**Materials and Methods:** In this study subjects were divided on age difference into three groups (Group I, 21-30 years, Group II, 31-40 years and Group III, more than 40 years). Samples were collected through masturbation, after liquefaction of sample analysis performed on light microscopy. Then, motility and morphology were performed in presence and absence of debris, agglutination and microbial contamination were noted.

**Results:** We found that despite of age difference young generation have more semen abnormal percentage 56% comparing to group II and near to group III (50% and 58%). Most prevalent abnormality among three groups was asthenoteratospermia. It seems that young generation in terms of abnormality is at elevated risk of infertility. This is due to environmental change, change in life style and nutritional intake of youth.

**Conclusion:** To overtake this alarming situation researcher must come-up with solution to cope the prevailing problem and save youth's fertility-cum-inheritance.

**Key Words:** Semen Parameters, Youth, Prevalence, Fecundity, Inheritance, Cope

**Citation of articles:** Murtaza G, Rafiq M, Zain N, Shah SA. Evaluating the Prevalence of Male Infertility in Karachi. Med Forum 2018;29(10):97-100.

## INTRODUCTION

A long-established semen evaluation method provides useful information about motility and morphology. However, due to variation of parameters from previous to fresh analysis and difference in performing ways among technician and laboratories, evaluation performed in this way has utility in predicting reproductive performance in an assisted reproductive setting.<sup>1</sup>

Approximately 15% of couples attempting their first pregnancy meet with failure. Most authorities define these patients as primarily infertile if they have been unable to achieve a pregnancy after one year of unprotected intercourse. Incumbently 48.5 million infertile couples are worldwide<sup>2</sup>, from which pure male factor accounts for 20-30%<sup>3</sup> and in Pakistan male infertility is 21.91%.<sup>4</sup>

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Received: April, 2018;

Accepted: June, 2018

A semen analysis is performed when a health practitioner thinks that a man or couple might have a fertility problem. Still routine semen evaluation is the main pillar to investigate male fertility. For semen evaluation WHO published first manual in 1980 as help hand for investigators. The recent modified manual published after the assessment of 4500 men from 14 different countries. The lower reference values for men who unable to conceive within 12 months of unprotective sex are: semen volume 1.5 per ml; total sperm count 39 million per ejaculate; sperm count per ml 15 million; 58% vitality; progressive motility 32%; total motility 40%; normal morphology 4%.<sup>5</sup>

Prediction of male infertility with limited power has been reported from 1980 to the presented.<sup>6,7</sup> In analysis microscopic and macroscopic parameters included. Before confirmation of normal or infertile multiple analysis should be carried out due to large variation in the sperm parameters.<sup>8</sup>

The macroscopic parameters are such as; volume which is accurate indicator of various abnormalities, regarding the appearance absence of spermatozoa in sample gives translucent appearance and non-sperm components render opaque appearance. A sample liquifies after ejaculation within 15-30 minutes is a normal. In the absence or obstruction of seminal vesicle a sample lack secretion from seminal vesicle and failed to coagulate. Prolonged liquefaction is due to the inflammation and it cause poor prostatic secretion. Viscosity is another property consider abnormal when the length of thread exceeds 60 mm. If these cases are associated with low

sperm motility, the sperm transportation will be compromised.<sup>5,6</sup>

Microscopic attributes of the seminal fluid include sperm concentration, motility, viability, morphology as well as non-sperm cellular components in the form of leukocyte concentration and immature germ cells. Among the parameters reported in a routine semen analysis, it is not yet known which one would be the most associated with fertility. While many Andrologist reports point to sperm morphology as the valuable parameter, others indicate sperm concentration and/or motility are the most valuable.<sup>9</sup>

In addition, a higher prevalence of primary and secondary infertility has been seen among repeated spontaneous aborters. Reports show that despite a normal fertilization rate, a higher rate of early spontaneous abortions occurred in patients with <4% morphologically normal spermatozoa as assessed by Kruger strict criteria.<sup>10</sup> This observation indicates that the main problem with morphologically abnormal spermatozoa was not an impaired fertilization, but rather that these spermatozoa may have resulted in a higher percentage of abnormal embryos which were aborted early in gestation.

Several studies have suggested that human semen quality and fecundity have been declining during the past decades.<sup>11,12</sup> Nevertheless, other works have obtained contradictory results indicating that these changes have not taken place homogeneously in the world.<sup>13,14</sup> Geographical differences in semen quality also support the fact that semen quality may have declined only in some areas.<sup>15,16</sup> Changes in seminal samples are recent<sup>17,18</sup> and may be related to environmental or occupational pollutants, changes in lifestyles, exposure to toxins, or dietary habits.<sup>19,20</sup>

## MATERIALS AND METHODS

This descriptive study was carried out at Karachi City from 1<sup>st</sup> January 2015 to 31<sup>st</sup> December 2015. This study is composed of 807 subjects which came for treatment of infertility and want to know cause of their infertility at Dr. Ruth K M Pfau, Civil Hospital Karachi. Although subject number is precise as we are living in male dominant society, male is unwilling to come up for the analysis and this study will enhance awareness among the individual to come forward for the analysis and treat their defects or get treated in time. Subject were divided into three age groups such as group I, 21-30 years, group II, 31-40 years and group III, more than 40 years. Samples were collected randomly with their name, abstinence period, collection time and poured entire ejaculate in a wide mouth sterile container.

Analysis done within 1 hour of collection to limit the deleterious effects of dehydration, pH or changes in temperature on motility. After the liquefaction of the sample at 37°C whole sample mixed thoroughly by

pipetting in & out then a drop of 5-10µl poured on slides and covered with coverslip. Then slide is putted on bench top incubator to maintain 37°C temperature of the drop for the proper analysis of sample. Then microscopic study is carried out on bright field microscope of the parameters to evaluate and record the values on record register. In the end results were analyzed and concluded. All the parameters were analyzed and recorded according to the WHO criteria excepting 4% morphology, according to the analyst at IVF laboratory<sup>18</sup> and advises caution when interpreting the new WHO reference values because they have not yet been accurately defined to discriminate fertile from infertile men that's why we retain morphology parameters as 30% as mostly IVF laboratory of Pakistan's evaluate. Samples having a major liquefaction problem, subjects under 20 years of age were also excluded from study and retain which lies under WHO criteria were included in study. All the data was analyzed by computer software SPSS 17.0.

## RESULTS

The cases are assessed for the following parameters teratospermia, asthenospermia, azoospermia, Necrospermia, oligospermia and their combination were selected for the study. Objects were divided into three groups [group I (21-30 years), II (31-40 years) and III (>40 years)]. Apart from this, from the same study population semen parameters were compared among the age groups and research data (Table 1). In the present study we have compared different parameters among three groups to analyse a significant difference in their parameters. We found that group I has high 56 % of abnormal semen analysis compared to group II 50% and nearby to group III 58% despite of age difference.

**Table No.1 Comparison of variables among the groups**

Variable	Group I	Group II	Group III
Normal	46	50	42
Abnormal	56	50	58
Asthenoteratospermia	17	16	18
Oligoasthenoteratospermia	12	<1	13
Teratospermia	10	09	13
Azoospermia	08	07	09
Asthenospermia	03	08	07
Oligoasthenospermia	03	09	<1
Oligospermia	01	<1	00
Necrospermia	<1	01	00

While analysing other parameters it's found that morphology and motility in combination have no significance difference among the groups I (17%), II (16%) and III (18%). In terms of count, motility and

morphology (Oligoasthenoteratospermia) group I have significance difference with group II <1% but there is no significance difference while comparing group I 12% to group III 13%.

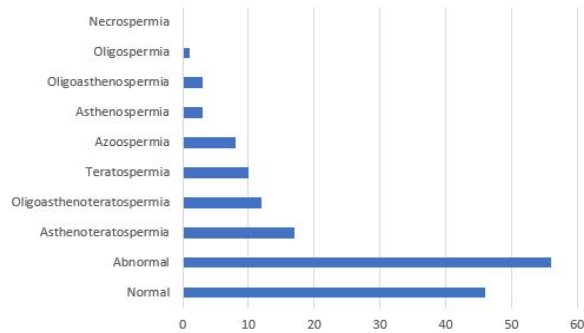


Figure No. 1: Comparison of variables among the group-I

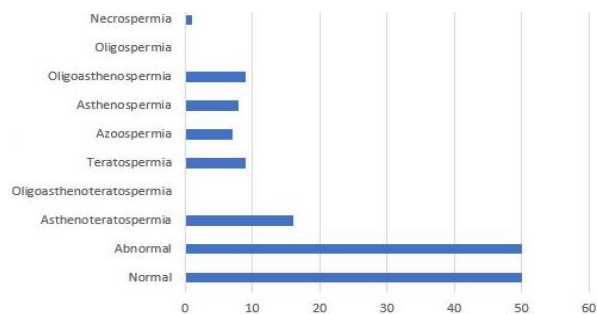


Figure No. 2: Comparison of variables among the group-II

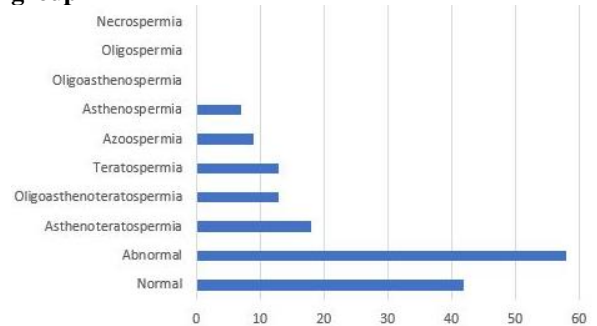


Figure No. 3: Comparison of variables among the group-III

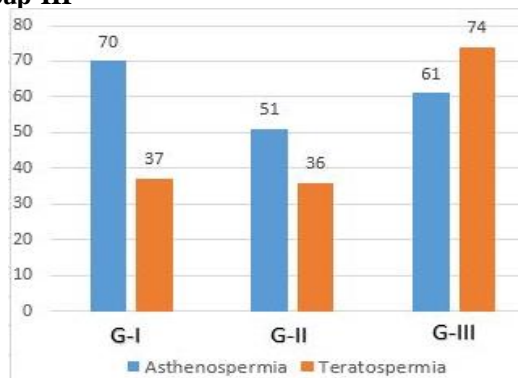


Figure No. 4: Most prevalent abnormality among the groups

By comparing motility and morphology defects, it increased as age of the subject increases. Analysing morphology, it's seem that increase in age there is increase in defects while comparison done among the groups (I-3%, II-09% and III-13%). Besides this, studying other parameter among groups we found no noticeable difference. In this study, it's found that most prevalent abnormality among the age groups (I-70%, II-51% and III-61%) is motility (Figures 1-4).

## DISCUSSION

The distribution of men according to age shows most of patient's flow were between the ages of 31-40 years (48%). It is well established by the study of Merino and Carranza-Lira et al. and found in this study that only small percentage of men attending the infertility clinics are older than 40 years (10 %).

In the present study in terms of abnormality group II (50%) and III (58%) compared, and it's found that there is increase in abnormality as age increases but comparing group I (56%) to II & III there is significance difference (Figs. 1-3). There are two possibilities, first due to awareness, young generation is step forward in diagnosis to cope problem at earliest, second is that due to changing life style, nutritional intake and environmental changing young generation is badly encircled in the infertility.

While analysing different parameters it's found that morphology and motility in combination have no significant difference among the groups I (17%), II (16%) and III (18%). In terms of count, motility and morphology group I have no significance difference with group II but there is significance difference while comparing group I to group III (Figs. 1-3). And found that young generation is also severely affected by these parameters and its alarming situation for youth regarding infertility. This incumbent situation is alike study of Carlsen E. et al 1992, Swan SH 2006 and Homan et al 2007 that there is decrease in semen quality past 5 decades.

According to Nieschlag et al<sup>21</sup> there is a significant decrease in sperm motility in older men but in this research, it's found that there is little bit decrease in sperm motility in older men with no prominent different among the groups (I-8%, II-8% and III-9%) of the Karachi people (Fig. 1-3).

Analysing morphology, it's seem that increase in age there is increase in defects of morphology in spermatozoa while comparison done among the groups (I-3%, II-09% and III-13%). Besides this, studying azoospermia parameter in groups (I-12%, II-07% and III-09%), there is noticeable difference (Fig. 1-3), and this Azoospermia condition also appears when Y-chromosome microdeletion occurs. It's seemed that youth is more prone to it too, researcher must study why this is happening to overcome the cause and save young's fertility.

Presently, it's found that most prevalent abnormality among the age groups (I-70%, II-51% and III-61%) is motility in combination along with the other parameters

(Fig. 1). Adding to this it seems that morphological defects increases as age increases (I-37%, II-36% and III-74%). These two are considered most important while treating male-infertility. Other parameters such as necrospemia, oligospermia and others in combination have no significance difference among the three groups.

## CONCLUSION

In this research, most prevalent abnormality is asthenoteratospermia in three groups. Besides, it seems that young generation in terms of semen abnormality is at high risk of infertility. This may be due to environmental change, change in life style and nutritional intake of youth. To overtake this alarming situation researchers, must come-up with solution to cope the problem from prevailing and save youth's fertility-cum-inheritance.

**Acknowledgement:** The authors are thankful to Dr. Saadat Aliya (Senior Embryologist SANAGYN of Prof Saad Rana, Islamabad), Dr. Fazia Raza (HoD Center for Reproductive Medicine RMI, Peshawar) and Shabana Gul (Andrologist Center for Reproductive Medicine, RMI, Peshawar) for their great assistance.

### Author's Contribution:

Concept & Design of Study:	Ghulam Murtaza
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Final Approval of version:	Ghulam Murtaza

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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