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A Cross Sectional Analytical Study of semen profile in patients with infertility.

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Abstract
Introduction: *Male infertility has become a serious concern for public health professionals, globally. In developing countries infertility rate is higher than the developed country.* ***Objective:*** *The objectives of the study was to find out the pattern of semen parameters in our population and to find out the frequency and type of Semen profile of patients with infertility.* ***Methodology:*** *This was a descriptive cross sectional analytical study conducted in Care Hospital, Dhaka, Bangladesh during the period from January 2019 to December 2019.* ***Result:*** *The study was conducted among the 200 infertile male patients. The mean age was 36.14 ± 5 yeras. The highest no of patients104 (52%) were in the 35 to 44 years group and the lowest no of patients 2(1%) were in 55 to 64 years group. The most common abnormality was azoospermia (10%) severe oligozospermia (4%), Mild to moderate oligozospermia (7.5%). Among the 200 patients 36 (18%) subjects had semen motility less than 40%. The mean total sperm count was 62.95 ± 42.10 and the mean sperm motility was 35.94 ±21.86*. ***Conclusion***: *The study reveals that azospermia and mild to moderate oligozospermia are the most common abnormalities among the infertile men presenting in a tertiary Infertility centre in Dhaka, Bangladesh. The semen morphology shows the highest variability followed by RL and sperm concentration. Services at this centre should take this into account and should be more oriented towards helping this group of patients*
Keywords: *Male infertility, Semen parameters, Azoospermia, oligozospermia*

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1. Introduction

Fertility has been the main study of civilization since immemorial time but the progression is rather sluggish. Infertility can be defined as the incapacity to fulfill pregnancy after 12 months of unprotected sex [1,2]. Male factor is a major cause of infertility in couples who fail to conceive. Male factor is solely responsible tn 20% of sub fertile couples and contributory in another 17 % [3]. Global data confirms that male are to be responsible either fully or partially for 35-40% cases of infertility, while female partners are responsible for 35-40% and the remaining 20-30% is the combination of couples and a small percentage of unknown causes [1]. Generally, infertility risk factors particularly for the case of male may append by gland infection, mumps orchitis, varicocele and cryptorchidism [4]. Common causes of male infertility include low sperm counts; abnormal morphology (shape and size of sperm), slow sperm motility (movement) and related problems with semen. Several studies have demonstrated that hazardous effect by environmental factors such as toxic substances radiation and pesticides can affect the male reproductive function [5].In Bangladesh, infertility remains a neglected issue due to overpopulation. Poverty, lifestyle, tuberculosis, malnutrition and anemia and reproductive tract infection are also the main risk factors of infertility. Sexual transmitted diseases (STD), late marriage, improper medication and general hygienic condition are also the causes of infertility in Bangladesh. However, the intensities of risk factors for male infertility in different countries and regions vary and the identification of major risk factors in any particular country would have importantly significant to public health. In developing countries, patterns of infertility are quite different from those in developed countries and the incidence of preventable infertility is much higher in developing countries [6]. Semen analysis is the basic and

minimum investigation to do for diagnosing male factor. In fact it is the first step towards diagnosis of male factor in fertility work up. During ejaculation, semen is produced from a concentrate suspension of spermatozoa stored in paired epididymis mixed with fluid secretion from the accessory sex glands. The total number of spermatozoa reflect sperm production by the testis and the patency of post testicular duct system. The total fluid volume reflects the secretary activity of glands. The nature of spermatozoa (concentration, vitality, motility and morphology) and the composition of seminal fluid are important for sperm function. Semen analysis is the study of semen parameters namely volume, pH, sperm count, sperm motility and sperm morphology. Semen analysis is performed in almost all standard pathological laboratories of Bangladesh. Our present study was performed in infertility unit of a Tertiary care hospital, Bangladesh during January 2019 to December 2020. The objective of the study was to define the pattern of normal semen parameters in our infertile patient population and to find out the frequency of abnormal semen parameters.

2. Objective

General objective:

- To focus to define the pattern of normal semen parameters in our infertile patient population and to find out the frequency of abnormal semen parameters.

3. Methodology

This was a descriptive cross sectional analytical study conducted in Care Hospital, Dhaka, Bangladesh during the period from January 2019 to December 2019. The study was conducted among a total no of 200 male patients who were diagnosed with infertility. All the findings were collected from the patient's record.

Purposive sampling technique was followed. The inclusion criteria for case group Couples with "pure" male factor infertility of twelve months or more, defined as not pregnant in spite of being desirous of pregnancy for at least twelve months with normal sexual activity and no birth control. Primary and Secondary infertility included. The reference values and terminology used are enumerated as follows Normal seminal fluid analysis (World Health Organization, 2010)

- Volume > 1.5-7.6 ml
- Sperm concentration > 15million/ml
- Sperm motility> 40-81%
- Morphology (strict criteria)> 4-48%

Semen analysis terminology 2

- Normozoospermia-all semen parameters normal
- Oligozoospermia-reduced sperm numbers

Mild to moderate: 5-20 million/ ml of semen
Severe: < Smillion/rnl of semen

- Asthenoozospermia-reduced sperm motility

Statistical methods

Descriptive statistical analysis has been carried out in the present study. The statistical data analysis was done using SPSS software version 23.0 for Windows.

Inclusion criteria:

- Couples with "pure" male factor infertility of twelve months or more, defined as not pregnant in spite of being desirous of pregnancy for at least twelve months with normal sexual activity and no birth control. Primary and Secondary infertility included.
- Abnormality of any one of the sperm parameters according to WHO or Kruger for concentration, motility or morphology.
- Age between 25 to 55 years.
- Candidate for ICSI treatment.

Exclusion criteria:

- Abnormal karyotype.
- Y micro deletion.
- Semen infection.
- CFTR gene mutation.
- Anti sperm antibodies.

4. Result

The study was conducted among the 200 infertile patients. The highest no of patients104 (52%) were in the 35 to 44 years group and the lowest no of patients 2(1%) were in 55 to 64 years group. The mean age of the patients from Dhaka city was 35.21± 5.32. [Figure 1]. The normospermia as well as other abnormalities causing infertility of the male. The most common abnormality was azoospermia (10%) severe oligozospermia (4%), Mild to moderate oligozospermia (7.5%). [Table 1] Among the 200 patients 36 (18%) subjects had semen motility less than 40%. The semen profile of the patients enrolled in this study are shown in Table 2.The mean total sperm count was 62.95 ± 42.10 and the mean sperm motility was 35.94 ±21.86 . The table shows the different parameters of normospermic Semen including the coefficient of variation. The semen morphology shows the highest variability followed by RL and sperm concentration. [Table 2]

Figure 1 : Age distribution of the patients

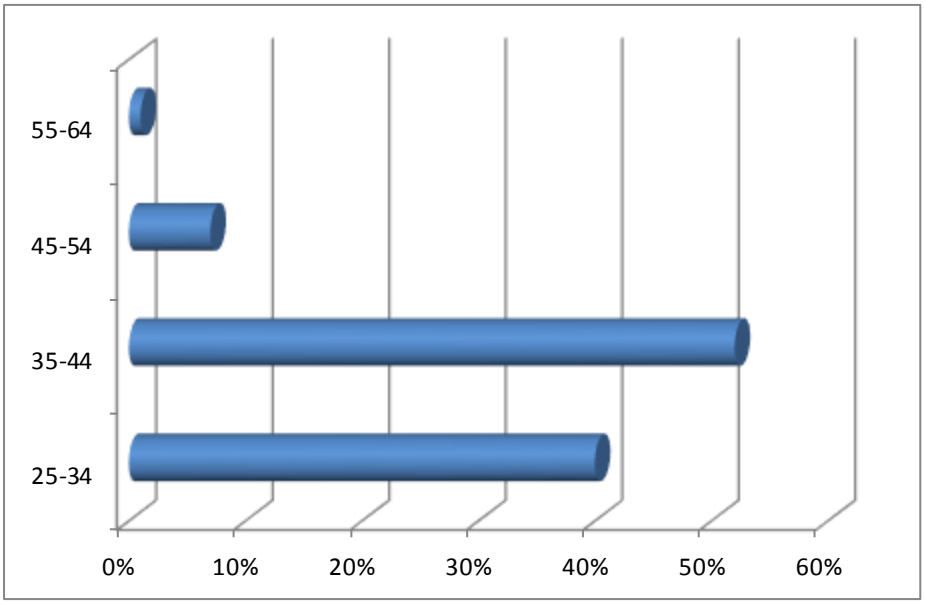

Table 1: Normoozo spermia and other abnormalities

Categories	Frequency	Percent
Azoospermia	20	10
Severe oligozospermia (<5million/ml)	8	4
Mild to moderate oligozospermia (5-20million/ml)	15	7.5

Table: 2 Semen of normoozospermic males: different parameters and their variability

Variables	**Mean± SD**	**Coefficient of variance**
Semen test: total count (million)	62.95 ± 42.10	66.88
Semen test: Motility (%)	35.94 ± 21.86	60.82
Semen test: RL (%)	18.67 ± 14.16	75.84
Semen test: SL (%)	7.68 ± 4.46	58.07
Semen test: NP (%)	4.79 ± 2.09	43.63
Semen test: Morphology (%)	24.78 ± 21.60	87.18

5. Discussion

Production of testosterone hormone begins to decrease around the age of 40, sperm quality changes with aging, also there is a decrease in the semen volume, motility and normal morphology [9].The findings are azospermia 10%, severe oligospermia (< 5millior/ml) 4%, mild to moderate oligospermia (5-20million/ml) 7.5% In descriptive analysis of semen parameters of the male partners of infertile couples presenting at the BSMMU the findings are azospermia 17.5% and severe oligospermia (< 5millior/ml) 3%, Mild to moderate oligozospermia (5-20millior/m1) 2.5%.[7] In descriptive analysis of semen parameters of the male 105 partners of infertile couples presenting at the University College Hospital in Nigeriaa, asthenospermia was the most common (21 .87o) abnormalilty , azospermia was 6.7%. Among the multiple factor abnormalities

asthenooligospermia was 25.57%, ohgoasthenoteratospermia was 13.l% [8].The difference may be attributed to the fact that less severe abnormalities of semen are mostly treated with success at primary level. A similar study was carried out back in 2007 -2008 in the Infertility unit by Anwary et als . The sample size was only 50. There was 4% normoozospermia, 42%, azospermia and 18% oligospermia. Frequency of azospermia was again the highest as it is now. The only 4%frequency of normooozospermia was probably because of inadequate sample size. The former study by Anwary et als had sperm concentration of 19.43± 25.18 million/ml, motility 24.04± 26.45%, normal morphology 21.62± 26.15% [9]. Our study has sperm concentration 62.95 ± 42.10 million/ml,, sperm motility 35.94 ± 21.86 %, normal morphology at 24.78 ± 21.60 %. The different means and wider standard deviations in the previous study is probably because the statistical analysis included both abnormal and normal specimens whereas we included only the normal specimens. The coefficient of variation in our study was highest with Normal morphology (87.18) followed by sperm concentration (66.88) and motility (60.82). It is similar to the findings of a study [10] where coefficient of variation between subjects was highest for sperm concentration (187.8) followed by sperm motility (98.7). The male partner can give semen at any time. For optimum results it is advisable to collect semen after a minimum 3 days abstinence. The semen quality depends on tirne since the last sexual activity. In the absence of ejaculation spermatozoa accumulates in the epididymisthen overflow into the urethra and flushed out in urine [11]. The fluids of accessory sex organs dilute the concentrated epididymal spefinatozoa at ejaculations.[12] Sperm concentration is not a direct measure of testicular sperm output. The total number of spenn per ejaculation (sperm concentration multiplied by semen volume) is a more accurate assessment of capacity of test is to produce spefinatozoa and the patency of the male tract [13]. It is recommended to calculate and report the total number of spermatozoa per ejaculate [14]. For this purpose semen volume has to be measured more accurately. The reference ranges and the reference limits of WHO manual 2010 are derived from data from between 400-1900 semen samples of recent fathers in eight countries on three continents [15]. Lower reference limit for semen volume is 1.5 ml. Lower reference limit for sperm concentration is 15 million/ml. The lower reference limit for total motility (PR+NP) is 40%. The lower reference limit for progressive motility is 32%.

Limitation of the study

Insufficient sample size for statistical measurement. Limed access to data. Time constrain.

6. Conclusion

The study reveals that azospermia and mild to moderate oligozospermia are the most common abnormalities among the infertile men presenting at the Infertility unit of Care Hospital. The semen morphology shows the highest variability followed by RL and sperm concentration. Services at this centre should take this into account and should be more oriented towards helping this group of patients.

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