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Original Research Article

Reduced Sperm Count as a Reason for Male Infertility - An Analytical Study in a Fertility Clinic in a Rural Medical College

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ABSTRACT

Introduction: Infertility is a common problem which affects a significant percentage of all married couples. In developing countries it is considered as a social stigma. On account of this many couples seek remedies which would bring an end to their quest for a progeny. This study aims to highlight the possible causes of reduced sperm count and sperm motility for establishing the male factor in a study of infertile couples attending a fertility clinic in a rural medical college hospital.
Materials and Methods: Sperm samples were collected from 55 males attending a fertility clinic and were subjected to analysis using an automatic sperm analyzer. The results were tabulated and subjected to morphological and statistical analysis.
Result: The mean semen volume was 1.60 ml. The mean liquefaction duration was 17.75 minutes. The mean sperm count was 30 million per ml. Azoospermic males were 16. Oligospermic males were 19. Normal morphology was seen in 20 cases. Motile sperms amounted for 30.94%. The mean ph was 7.5. The rapid progressive motility was 22.13%. Non progressive motility was 8.63%. Immotility was 32.12%. Normal morphology of sperms was 11.30%. Motile sperm concentration was 17.20 million per ml. Progressive motile sperm concentration was 12.97 million per ml. Functional sperm concentration was 4.18 million per ml. Average velocity of sperm was 5.64 microns per second.
Conclusion: From the present study it is evident that there has been a decline in the sperm count of men which is a positive finding and a factor for male infertility. Since the sample size is modest extensive study has to be done in a larger sample size to obtain a conclusive idea for factors responsible for decline in sperm count.
Key words: Semen, analysis, infertility, sperm, sperm count, motility.

INTRODUCTION

It is a natural desire of human beings to propagate their lineage and is a part and parcel of human evolution. The inability to conceive and produce a progeny results in depression in couples. This infertility or sub fertility forces couples to seek a solution as the problem results in a social stigma. In the modern era with advancements in the medical field, there are various assisted reproductive techniques available to achieve a pregnancy in infertile/sub fertile couples. However the methods available are not foolproof as a small percentage of couples the causative factor is not known.

The purpose of male evaluation among the couple attending the infertility clinic is to identify and treat the correctable cause of sub fertility and sometimes men attending the infertile clinic seek an explanation for problem which can be identified during the male infertility evaluation. Male infertility evaluation can uncover significant medical and genetic pathology that could affect the patient's health or his offspring. Male and female factors coexist in about one third of cases while one third of the cases are secondary to male factors only. Therefore evaluation of both partners is essential and in women gynecological evaluation should proceed simultaneously along with evaluation of the male component also. Appropriate evaluation and treatment of sub fertile men are critical in delivering suitable remedy to the infertile couples. Hence semen analysis alone is sufficient to adequately evaluate the male partner. By diagnosing the treatable male factor pathology which is cost effective can reduce the woman of invasive procedures and potential complications associated with assisted reproductive techniques and decrease the risk of multiple births.

Infertility is a major problem prevailing world wide in about 15% of all couples and male factor contributes to 50% among them. [1] A recognizable decline in the semen quality been observed in the south Indian population. [2] Infertility affects 1 in 5 couples in the reproductive age group and in most of the infertility cases are idiopathic. [3] Reduction in the semen quality may be because of genetic factors, lifestyle, exposure to pollutants and stress. In most of the infertile men the reason for spermatogenic failure is unknown and it can be termed as idiopathic male infertility. Precise evaluations of seminal parameters of sub fertile men are essential in the infertility clinic to conclude the probable cause of the infertility and treatment for the same. The present study aims to document the pattern of seminal parameters of subfertile men and the fertile men and thereby to correlate age of the infertile men with the motility of sperm.

MATERIALS & METHODS

This descriptive study was done in 55 male partners of couples attending the Infertility clinic of Vinayaka Missions hospital, Salem, Tamil Nadu. The semen sample was collected from male partners of couples following sexual abstinence of three days. The semen sample was collected in sterile plastic containers, the date and time of the sample collection was documented. Semen volume was measured and the liquefaction duration was observed .The entire analysis of semen profile was done in the fresh samples. The semen sample was subjected to automated sperm quality analyzer. Based on the WHO guidelines 2010, [4] the parameters of the semen like volume, Ph, WBC concentration, sperm concentration, motility, immotility, morphology of the sperm were analyzed. The age of the individual was recorded at the time of sample collection and was analyzed in relation with the motility factor.

Statistical Analysis

The parameters obtained from the study were statistically analyzed for validating the study using SPSS software version 16. Paired sample "t" test was done to ascertain the 'p' value for significance of the study.

RESULTS

The mean semen volume was 1.60ml (Table-1). The mean liquefaction duration was 17.75 minutes (Table-1). The mean sperm count was 30 million per ml (Table-1). Azoospermic males were 16 and Oligospermic males were 19 (Table-1). Normal morphology was seen in 20 cases. Motile sperms amounted for 30.94%. The

mean ph was 7.5 (Table-3). The rapid progressive motility was 22.13% (Figure 1). Non progressive motility was 8.63% (Figure 1). Immotility was 32.12% (Figure 2). Normal morphology of sperms was 11.30% (Figure 2). Motile sperm concentration was 17.20 million per ml. Progressive motile sperm concentration was 12.97 million per ml. Functional sperm concentration was 4.18 million per ml (Figure 2). Average velocity of sperm was 5.64 microns per second (Table-1).

Table -1: Mean values of Semen parameters of Infertile Men.

Semen parameters	Normal fertile Men N = 20	Oligo/asthen/tetatozoospermic Men N=19	Azoospermic Men N=16
Volume(ml)	1.6	1.6	1.5
Age(years)	35.25	36.73	33.68
Liquefaction duration(min)	18	16.84	18.437
PH	7.5	7.7	7.3
Sperm concentration(million/ml)	65.3	25.02	0
Motility (%)	64.4	28.42	0
Rapid progressive motility (%)	51.55	14.84	0
Non progressive Motility (%)	12.85	13.05	0
Immotility (%)	35.6	60.78	0
Morphology normal (%)	16.4	9.52	0
Motile sperm concentration(million/ml)	43.89	7.72	0
Progressive motile sperm concentration (million/ml)	34.67	4.26	0
Functional sperm concentration (million/ml)	12	0.54	0
Velocity (mic/sec)	12.3	4.63	0
Total per ejaculation			
Semen Parameters	**Normal Men**	**Oligo/Astheno/Teratozoospermic Men**	**Azoospermic**
Total sperm number (million)	127.87	45.65	0
Total motile sperm (million)	70.91	13.67	0
Total progressively motile sperm (million)	38.3	7.37	0
Total functional sperm (million)	18.2	1.53	0
Total morphology normal (million)	17.92	2.12	0

Table-2: S.Dvalues of semen parameters of Infertile Men.

Semen parameters	Normal	Oligo/Astheno/ Teratozoospermic	Azoospermic
Volume	.66094	1.09558	.66380
Liquefaction Duration	3.7696	3.41993	5.3903
Ph	.42920	.30589	.40311

The mean of total sperm number per ejaculate was 57.84 million (Figure 3). The mean of total motile sperms per ejaculate was 28.19 million (Figure 3). The mean of total functional sperms per ejaculate was 6.57 million (Figure 3). The mean of total

progressive motile sperm per ejaculate was 20.53 million (Figure 3). The mean of normal morphology per ejaculate was 6.68 million (Table-1).

In the 19 Oligospermic males, asthenospermia and teratoazoospermia were observed. The SD for the volume of semen was 1.0955 (Table-2). The SD for liquefaction duration was 3.419 (Table-2). The SD for ph was 0.3058 (Table-2).

Paired Student 't' test was done to ascertain the differences between normal males and Oligospermic/Asthenospermic/ teratoazoospermic males (Table-3). Paired student 't' was done to ascertain the differences between the normal males and Azoospermic males (Table-4).

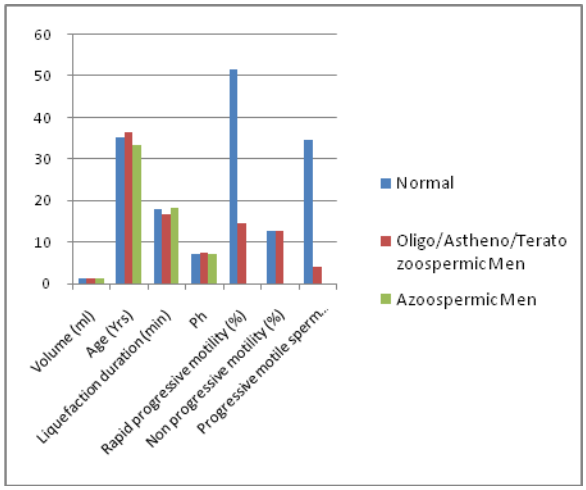

Figure 1: Semen values (Mean) in Infertile Men.

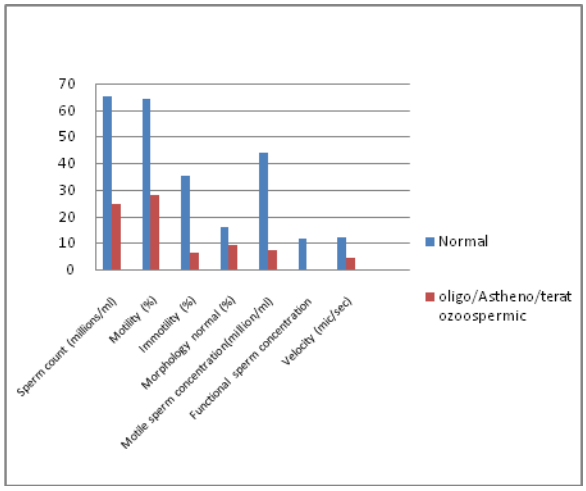

Figure 2: Semen Parameters (Mean) in Infertile Men.

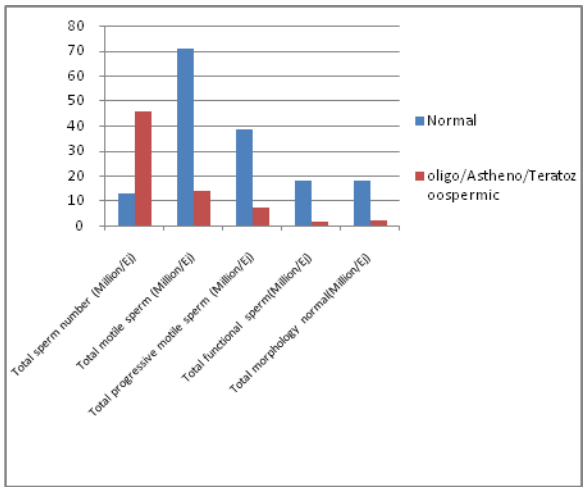

Figure 3: Sperm parameters Per Ejaculation in Infertile Men.

DISCUSSION

Semen analysis is a reliable analytical investigation for diagnosing male component in infertility. Evaluating the male factor for infertility in a meticulous manner will be indispensible in diagnosis. [5] In the present study only semen analysis was used as a tool for evaluation of male infertility. Asthenozoospermia was found to be a common abnormality in many studies. [5] In the present study asthenospermia and azoospermia were more predominant. Normospermic was approximately one third of the cases. This study contained subjects whose age ranged between 21 and 45 years and the semen volume remained at an average of 1.6ml. According to a study performed in 2003, inverse effect of age was observed on sperm motility and semen volume. [6] Age of the male component has a bearing on the volume of semen, motility of sperm and the morphological characteristics of sperm. [7] In the present study also there has been a significant decline in the volume and motility of sperms as the age increases. The incidence of Oligospermic and Azoospermic samples were marginally higher than the normal samples. This was in accordance with a study where Oligospermic semen was more than normal semen. [8] In the present study there has been

a reduction in sperm motility but in an earlier study the age does not affect the sperm function in older people. [9]

In the present study semen analysis is a determining yardstick for male component in infertility. However other male factors like rare functional defects may affect the outcome even if the semen analysis is normal. [10]

Table 3: Paired Student 't' test for normal and Oligo/Astheno/Teratozoospermic males.

Normal Men vs Oligo/Astheno/Teratozoospermic Men	Paired Differnces					t	dt	Sig.2 (tailed)
	Mean	Std.Deviation	Std..Error. Mean	95%confidence interval of Difference				
				Upper	Lower			
Age	-1.157	7.25919	1.66537	-4.65671	2.34093	-.695	18	.496
Volume	-.1052	1.20852	.27725	-.68775	.47723	-.380	18	.709
Liquefaction duration	1.052	5.42088	1.24364	-1.56015	3.66541	.846	18	.408
Ph	-.2631	.586	.134	-.545	.019	-1.957	18	.066
Sperm concentration	5.686	33.893	7.775	40.532	73.204	7.314	18	.000
Motility	5.718	19.369	4.443	47.848	66.519	12.869	18	.000
Immotility	-2.573	26.259	6.024	-38.393	-13.080	-4.272	18	.000
Rapid progressive motility	4.423	18.730	4.296	35.209	53.264	10.295	18	.000
Non progressive Motility	-.1052	14.448	3.314	-7.069	6.858	-.032	18	.975
Morphology Normal	7.000	19.359	4.441	-2.330	16.330	1.576	18	.132
Progressive Motile sperm concentration	3.0447	16.937	3.885	22.283	38.610	7.836	18	.000
Functional Sperm concentration	1.155	8.880	2.037	7.272	15.832	5.671	18	.000
Velocity	7.684	4.1506	.9522	5.683	9.6847	8.070	18	.000

Table 4: Paired Student 't' test for normal and Azoospermic males.

Normal Men vs Azoospermic Men	Paired differences					t	dt	Sig.2 (tailed)
	Mean	Std Deviation	Std error mean	95%confidence interval of the difference				
				Upper limit	Lower limit			
Age	1.93	9.726	2.431	-3.245	7.120	.797	15	.438
Volume	-.031	.8459	.2114	-.482	.4195	-.148	15	.884
Liquefaction Duration	-.312	5.907	1.476	-3.460	2.835	-.212	15	.835
Ph	.250	.605	.1513	-.0726	.572	1.651	15	.119
Sperm concentration	6.58	36.893	9.223	46.184	85.502	7.139	15	.000
Motility	6.25	18.504	4.626	52.639	72.360	13.511	15	.000
Rapid progressive motility	5.15	15.954	3.988	42.998	60.001	12.912	15	.000
Non progressive motility	1.10	4.575	1.143	8.562	13.438	9.617	15	.000
Immotility	3.75	18.504	4.626	27.639	47.360	8.106	15	.000
Morphology Normal	1.59	7.531	1.882	11.924	19.950	8.464	15	.000
Progressive motile sperm concentration	3.53	19.660	4.915	24.892	45.84	7.196	15	.000
Functional sperm concentration	1.20	9.232	2.308	7.105	16.944	5.210	15	.000
Velocity	1.28	2.578	.6446	11.500	14.249	19.971	15	.000

CONCLUSION

Semen Analysis is a reliable parameter for assessing the male factor in

infertile couples. However reduction in sperm count along with increasing age will have a detrimental effect on couples who are trying to conceive. The findings obtained from the present study can be inferred as guideline while treating the male component in this part of the world. While investigating the male factor due attention should be paid to rule out other functional and constitutional diseases. Since the number of samples in the present study is very small, the authors are under preparation to enlarge the number of samples to conduct the study with the same parameters.

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