ORIGINAL RESEARCH PAPER

Volume-6 | Issue-11 | November-2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

OBJECTIVE SCORING AND CLINICAL CORRELATION OF SEMEN QUALITY IN INFERTILE MALES.

Pathology

DR NAVTEJ SINGH NALWA MD PATHOLOGY HIMALYAN INSTITUTE OF MEDICAL SCIENCES, DEHRADUN

DR ADITI BAGHLA* MD PATHOLOGY ASSOCIATE PROFESSOR MAHARAJA AGRASEN MEDICAL COLLEGE, AGROHA *CORRESPONDING AUTHOR

DR MONIKA GIRDHAR MD PATHOLOGY ASSOCIATE PROFESSOR MAHARAJA AGRASEN MEDICAL COLLEGE,AGROHA

ABSTRACT

Background: Semen analysis is the index of efficiency of spermatogenesis. In spite of being mainstay of male evaluation semen analysis is the most neglected test in terms of patient preparation, collection of sample and even examination. The aim of the present study is to perform semen analysis according to WHO criteria and to use an objective scoring system to grade the semen quality. With the above aim in mind, 158 infertile males and 25 controls (with proven fertility) were included in this study. These were referred to the pathology department from obstetric and gynaecology OPD.

Material and Method: Samples of semen analysis were collected in the department of pathology in sterile plastic containers by masturbation. A thorough physical examination was done and history was taken. Routine semen analysis was done within one hour of collection. Hypoosmotic Swelling Test was done in all the cases (wherever applicable) and Mixed Antiglobulin Reaction was done in the patients with deranged HOS test.

Result: Semen analysis therefore forms the basis of evaluation of male infertility and secondly with help of scoring system we can segregate our patients for further benefits by assisted reproduction techniques accordingly standards and there is great amount of overlapping between infertile males and those with proven evidence of fertility. Therefore WHO itself suggests each laboratory to establish its own reference range.(4)

KEYWORDS

Semen, Infertility,Sperm

INTRODUCTION

Infertility is the inability to naturally conceive a child or inability to carry a pregnancy to term, occurring in 15% of human couples out of which 20% have solely male factor(1)(2). The male factor refers to any problems within male reproductive system specifically the sperms (3). Thus semen analysis is initial and most essential step for evaluation of male fertility. Routine semen analysis do not strictly fit with WHO

MATERIALAND METHODS:

This study was carried in department of pathology of Himalyan Institute of Medical Sciences, Dehradun. A total 183 cases were studied and further divided into two groups : A) patients with infertility and B) Control group of males with proven evidence of fertility. A careful detailed history was taken and thorough physical examination was done. Samples were collected in clean wide mouthed plastic container after abstinence of minimum 3days not more than 6 days(1). Strict criteria for sample collection were made and samples were rejected in following cases:

1) Coital abstinence for more of less than 2-5days.
2) Incomplete collection of sample.
3) Sample exposed to extremes of temperature.
4) Sample collected at home or elsewhere.
5) Use of condom for collection of sample.

Tests were done manually following strict criteria given by WHO(4)
Physical examination of semen was done including following parameters: Liquefection, Appearance and Colour, Volume, Viscosity, pH.

The wet smears were prepared and scanned to determine mucous strands, sperm distribution and sperm aggregation, later examined under high power to see morphology of spermatozoa. A note was also made on number of epithelial cells, leukocytes , immature germ cells along with presence of trichomonas vaginalis, fungal spores, ova or worm.

Sperm vitality was determined by dye exclusion method by examining total 200 spermatozoa and calculating the percentage.

The sperm concentration was determined by using haematocytometer in 1:20 dilution using neubauer chamber.

The sperm morphology was assessed by staining with papanicolaou stain and examining under 100x oil and all the abnormal forms were noted.

Hypo-Osmotic swelling test was also performed based on principle that semi permeability of intact cell membrane leads to swelling in hypo- osmotic conditions.

Testing for antibody coating of spermatozoa was done with use of mixed antiglobulin reactions. Agglutination of spermatoza was taken as suggestive of immunological cause of infertility.

Objective scoring system given by Gopalkrishan et al has been used(5)

SCORE	2	1	0
LIQUEFACTION	20 to 30	35 to 45	
VOLUME	1.5 to 4.5	4.5 to 5.0	
VISCOSITY	Normal	Moderate	High
PARTICULATE MATTER	Nil to Mild	Moderate	High
AGGLUTINATION	Nil	5 to 10%	>10%
MOTILITY	>25%	10 to 20%	<10%
VITALITY(%)	>60	40 to 60%	<40
DENSITY	>20	10 to 20	<10
NORMAL	>35	30 to 35	<30
HEADLESS(%)	<20	15 to 20	>20

Interpretation:

SCORE:
15 -20 FERTILE
10 -14 SUBFERTILE
<10 INFERTILE

OBSERVATIONS

This study was carried in department of pathology of Himalyan Institute of Medical Sciences, Dehradun on total 183 cases out of which 158 were infertile and 25 controls with proven fertility. Out of these 158 cases 129(81.6%) presented with primary infertility and 29(18.4%) with secondary infertility. The maximum patients were in age group of 21-30 years.

The observation and results of the present study are as follows:

Table I Age wise distribution of patients who presented with infertility

Age group (years)	N=158	Percentage
21-25	34	21.5
26-30	64	40.5
31-35	31	19.6
36-40	25	15.8
41-45	3	1.9
>=46	1	0.7

Table II Distribution of semen volume in infertile and control group

	Infertile Group		Control Group	
Volume	N=158	Percentage	N=25	Percentage
Less than 1.5	16	10	0	0
Normal	132	83.7	25	100
Greater than 4.5	10	6.3	0	0

In the infertile group 10% had volume less than 1.5 ml while 6.3%had volume above 4.5 ml.

Table III Distribution of seminal pH among infertile and control group

	Infertile Group		Control Group	
pH	N=158	Percentage	N=25	Percentage
Less than 7.2	13	8.2	0	0
Normal	122	77.2	25	100
Greater than 7.8	23	14.6	0	0

Table IV Variations of liquefaction time of semen in infertile and the control group

	Infertile Group		Control Group	
Time(min)	N=158	Percentage	N=25	Percentage
<20	110	69.5	25	100
21-40	32	20.3	0	0
40-60	4	2.5	0	0
>60	12	7.6	0	0

Infertile males showed abnormal liquefaction time of semen.

Table V Age wise distribution of infertile group suffering from oligospermia, asthenospermia and teratrospermia

Age group	Oligospermia N=48(%)	Asthenospermia N=104(%)	Teratospermia n=60(%)
20-30	29 (60.4)	58 (55.8)	32 (53.3)
31-40	18 (37.5)	46 (44.2)	26 (43.3)
>=40	1 (2.1)	0 (0)	2 (3.4)

Table VI Table showing pattern of azoospermia,o ligospermia, normo spermia in infertile and control group.

	Infertile Group		Control Group	
Impression	N=158	Percentage	N=25	Percentage
Azoospermic	31	19.6	0	0
Oligospermic	48	30.4	0	0
Normospermic	79	50	25	100

Abnormalities in the semen were highest in the age group of 20-30 years. The commonest abnormality was asthenospermia (N=58) followed by teratospermia (N=32) and oligospermia was seen in 29 patients.

Table VII Table showing distribution of normal and abnormal sperm viability and morphology in infertile and control group.

	Infertile Group		Control Group	
	N=127	Percentage	N=25	Percentage
Abnormal Viability	53	41.7	0	0
Normal Viability	74	58.3	25	100
Teratospermia	60	47.2	25	100
Normal Morphology	67	52.8	0	0

Table VIII Table showing infertile group with abnormal HOS and abnormal semen parameters like motility , viability, morphology and MAR

	HOS<60		HOS>60	
	N=63	53.84%	N=39	%
Asthenospermia	61	96.8	28	71.8
Normal motility	2	3.2	11	28.2
Abnormal motility	33	52.3	5	12.8
Normal viability	30	47.7	34	87.2
Teratospermia	52	82.5	8	20.5
Normal morphology	11	17.5	31	79.5
Positive MAR	18	28.6	0	0

Table IX Table showing correlation of agglutination and MAR

Total no of patients	N=127	Percentage
Cases with agglutination	78	61.4
Cases with positive MAR with agglutination	18	23.1
Cases with negative MAR with agglutination	60	76.9

Table X Table showing categorization of infertile group according to scoring system

Total no of patients	N=158	PERCENTAGE
Infertile	42	26.6
Subfertile	52	33
Fertile	64	40.4

Table XI Table showing Categorization of infertile group accord ing to objective scoring

Total no. of Patients	N=158	Percentage
Infertile < 10	42	26.6
Subfertile 10-14	52	33
Fertile>=15	64	40.4

DISCUSSION

The present study included 158 infertile males, the maximum abnormalities were in the age group of 20-30 years, and the commonest abnormality was asthenospermia, followed by tetratospermia and oligospermia further well supported the statement of Francavilla F et al that sperm morphology is the most significant semen parameter that correlates with sperm fertilizing ability(6) and also correlates well with another study by Nallella KP et al where 83% of the patients presenting with infertility had abnormal sperm morphology(2).The present study and the previous studies by Abrari Andheeb concludes that decreased semen volume can be due to obstruction of genital tract or prostatitis and increase in the volume can be due to prolonged abstinence or pyospermia due to genital tract infection(3).

Altered pH was observed in 36 cases out of which 13 patients had a pH<7.2 while 23 pH >7.8 and only 5 males gave a history of genital tract infection having altered pH simulating another study where altered pH was observed in males harboring infection(3).Among 48 patients in the infertile group with abnormal liquefaction time only 3 patients with abnormal liquefaction time gave a history of infection of the genital tract favouring the statement that obstruction at the level of the prostate or below can lead to abnormal liquefaction time(3).

In the present study a large group of males (81.9%) in the infertile group had abnormal motility according to the criteria established by WHO. The cases of azoospermia were separated from this group. Fourteen cases showed isolated asthenospermia in the infertile group while others were in combination with oligo/ tetratospermia in collaboration to study by Samuel 25% the motility was found to be critical indicator of semen quality and fertility potential because its required for penetration of cervical mucus and transport through the female genital tract. Isolated asthenospermia was present in 24% of patients while 55% of patients had other sperm defects such as oligospermia and/or teratospermia(9).

In the present study 31 patients had azoospermia. Oligospermia was

present in 48 patients suggesting that azoospermia and oligospermia are prevalent in the infertile group in significant proportions. An obstruction of the pathway, gonadal dysgenesis or previous history of infection, are all important in azoospermic and oligospermic patients. 5 patients with oliigospermia had small testis in the present study. 2 had undecended testis. 2 patients gave history of mumps who had azoospermia favouring the study that sperm concentration and motility both are better predictors of fertility as compared to morphology The HOS test described by Jeyendran et al has been claimed to be useful for assessing the functional integrity of human sperm membrane thus HOS test score, standard sperm parameter and MAR in infertile men was evaluated(10). 53.84% males presented with an abnormal HOS had increased incidence of abnormal morphology, viability and motility as compared with the males having normal HOS. Suggesting, a correlation between abnormal sperm parameters and abnormal HOS test and and HOS is a relevant part of male fertility assessment(11).

Spontaneous sperm agglutination may be due to infections or immunological cause. MAR test positively proves presence of IgG antibodies on spermatozoa and therefore MAR can be used as a method for screening for antisperm antibodies. In the present study 23.1% of the infertile patients showed a positive MAR(for IgG) suggesting the role of autoimmunity in infertility.It was further seen that all of the males with a positive MAR showed presence of agglutination where as in 76% of cases agglutination was present but antisperm antibodies by MAR test could not be detected. This suggests that whenever agglutination is seen in a semen sample in should be further evaluated for antisperm antibodies.(12)

In this study scoring was done according to Gopalkrishan et al and found out large group was of fertile and subfertile people that can be benefited by advanced reproduction technique.(5)

CONCLUSION

In conclusion this study is an agreement with previous studies and it can be said that of all the semen parameters, motility, semen concentration and morphology are important. A defect in either of these can result in infertility. Semen analysis therefore forms the basis of evaluation of male infertility and secondly with help of scoring system we can segregate our patients for further benefits by assisted reproduction techniques accordingly. . Besides with so much variation and overlapping of results between fertile and infertile males, even laboratory should prepare its own reference range according to WHO.

REFERENCES

1) Lory B, Andrews JD. Legal issues in infertility management. In: Larry I. Lipshultz editors. Infertility in the male.2nd edition.St. Louis: Mosby year book,Inc;1991:p.448.
2) Nallella KP, Sharma RK, Aziz N, Agarwal A. Significance of sperm characteristics in the evaluation of male infertility. Fretility and sterility 2006;85:629-34.
3) Abrari Andheeb, Aziz Mehar. Semen analysis profile in male infertility: An experience with 100 cases. Indian J Pathol Microbiol 2003;46:44-6
4) Aitken RJ, Baker HWG, editors. WHO Laboratory Manual for the examination of human semen and sperm-cervical mucus interaction. 4th ed. WHO: Cambridge University Press; 1999 p.5-29.
5) Gopalkrishnan K. Relationship between routine semen analysis, semen score and sperm function assays in men. Institute for research in reproduction Bombay :1990;157-63
6) Francavilla F, Romano R, Santucci R, Poccia G. Effect of sperm morphology and motile sperm count on outcome of intrauterine insemination in oilgozoospermia and/or asthenozoospermia. Fertility and sterility 1980;53:892-7.
7) Chia SE, Tay SK, Lim ST. What constitutes a normal seminal analysis? Semen parameters 0f 243 fertile men. Human reproduction 1998;13:3394-8.
8) Printzan I, Ludwig M, Kohn F, Weidmen W. Surgical therapy in infertile men with ejaculatory duct obstruction: technique and outcome of a standardized surgical approach. Human reproduction 2000;15:1364-8.
9) Samuel I Thompson MI. Prevention of male infertility an update. Urologic Clinics of North America 1994;21:365-76.
10) Jeyender RS, Van der Ven, Rachagan SP, Perez Pelaez M. Semen quality and in-vitro fertilization. Australian and New Zealand Journal of Obstetrics and Gynaecology 1989;29;168-172.
11) Smith R, Madariaga M, Obregon E. Reappraisal of hyposmotic swelling test to improve assessment of seminal fertility status. International Journal of Andrology 1992; 15:5-13
12) Kunathikom S, Worasatit C, Toomgsuwan S. Relationship between the Direct Mixed Antiglobulin Reaction (MAR) test and spontaneous sperm agglutination in men from infertile couples. J