SOME OBSERVATIONS ON HUMAN SEMEN ANALYSIS

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Summary: Semen analysis of 66 unmarried medical students in the age group of 17-21 years was carried out. A higher liquefaction time, pH, motility, lower sperm count and abnormal forms were observed compared to reported values. Liquefaction time, pH and sperm count was found significantly different in non-vegetarians and vegetarians, perhaps due to difference in their dietary proteins.

Key words:

semen

sperm count

INTRODUCTION

Data on semen examination in healthy Indian subjects has been scanty. There is at present no standard criterion of normal values for semen (4). In fact the available literature is largely from sterility clinics (2). Evidently these studies are based on subjects having infertility as their main complaint. As such these people cannot be taken as an index of normal healthy Indians, and the values of their semen analysis cannot be taken as a representative of the cross section of normal male population. Secondly, the influence of previously taken indigenous drugs - a very common practice - on semen of these people cannot be completely ignored.

The present study was undertaken with a view to establish the normal values of semen analysis in young healthy Indian subjects.

MATERIALS AND METHODS

Unmarried students of B.R.D. Medical College, Gorakhpur, formed the subjects for this study. A detailed medical history with special reference to any febrile illness in the preceding weeks, chronic urinary infection, mumps, varicocele, orchitis, trauma and irradiation to testes was taken. The students chosen were non-smokers and not addicted to drugs. This was followed by thorough clinical examination in each subject. Routine stool, urine and blood examinations were also done to exclude any disease. An enquiry was also made regarding their dietetic habits and frequency of masturbation.

The subjects were asked to observe 3 days abstinance prior to the examination. The semen was collected by ejaculation in a wide mouth sterilized container in the morning (10-11 A.M.). The time of ejaculation was accurately noted down by the subject himself. Three such samples of semen were collected and analysed (3) at an interval of 15 days each subject and the mean value was taken into consideration.

The motile and non-motile supermatozoa in several high power fields were counted and percent of motile forms were noted. Using Formalin solution (Sodium bicarbonate 5 gm, Formalin (40%) 1 ml and Distilled water 100 ml) for dilution sperm count was done in Neubauer Chamber by using WBC diluting pipette. Morphological appearance was seen by making smears from the specimen diluted for the sperm count and staining with hematoxylin-eosin. The liquefaction time was noted when the gel completely disappeared.

RESULTS

The study included 66 students of 17-21 years age with a mean age of 19.2 years. All the subjects had been in the habit of masturbation since the age of 14-15 years with an average frequency of 3-4 times in a week. The results of various parameters of the semen examination of these subjects are given in Table I. The colour of semen in all the subjects varied from white to yellowish white. The odour was fishy and the consistency was mucoid. The age of the subjects did not show any consistent difference in the character of the specimen.

Parameters	Range of values	Mean value ±S.D.	
Volume (ml)	0.8-5.7	2.7 ± 1.06	
Liquefaction time (min)	38—118	46.4 ± 24.86	
pH	6-9	8.3 ± 0.91	
Sperm count (mill/ml)	20—100	51.4 ± 17.46	
Motility at 1 hr (%)	80—95	87.0 ± 9.51	
Abnormal shape (%)	8—19	10.3 ± 10.82	

TABLE I: Semen analysis of 66 normal subjects.

Out of the total of 66 subjects, 12 (18.18%) were non-vegetarian and 54 (81.82%) were vegetarian. Non-vegetarians included persons taking 2 eggs daily and about 100 gms meat thrice in a week. The vegetarians consisted of students who never took egg and meat. A comparison of the semen examination of both these groups was made and the results are presented in Table II. No significant difference was observed in the volume of the semen, motility and morphology of the sperms of these two groups. However, the semen of vegetarian subjects was observed to have higher pH and sperm count but the liquefaction time was reduced as compared to non-vegetarian subjects.

DISCUSSION

There has been paucity of literature on semen examinution in healthy Indian subjects. Till today clinicians have been depending upon the normal values as reported in western literature. However, as climatic conditions, racial factors and dietary habits of our people are much different so the need of Indian standard is all the more desirable. Our subjects belonged to younger

age and were of unmarried status yet in this part of the country this very age group is representative of their married and fertile counterparts in other social walks of life. The results of the present study has been unexpectedly different and surprising even for the investigators themselves.

TABLE II: The semen analysis of vegetarian and non-vegetarian subjects.

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Volume (ml)	Non-vegetarian	2.58 ± 1.00	in view of sceresty or liter
	Vegetarian	2.74 ± 1.07	>0.05
Liquefaction time (min)	Non-vegetarian	52.50 ± 37.00	
	Vegetarian	45.00 ± 21.00	< 0.05
pH	Non-vegetarian	8.00 ± 0.91	d Burnifor B.K. and S.
	Vegetarian	8.42 ± 0.89	< 0.05
Sperm count (mill/ml)	Non-vegetarian	47.50 ± 12.99	E District Co. Tool B
	Vegetarian	52.22 ± 18.20	< 0.05
Motility (%) at 1 hr	Non-vegetarian	85.42 ± 21.05	>0.05
	Vegetarian	87.31 ± 3.35	
Abnormal forms (%)	Non-vegetarian	10.75 ± 2.86	d. McGrac Browne LC.
	Vegetarian	10.16 ± 11.71	>0.05

The volume, odour, colour and consistency of the semen specimens of our subjects does not differ from others (7,11,5,8,10). The most important finding has been the low sperm count with mean value of 51,36 million per ml. 75.7% (50 out of 66) subjects in the present study had counts lower than 60 million per ml a value mostly associated with subfertility (6,9,5). However, the incidence of non-motile and abnormal forms of sperms observed has been much lower as compared to the other reported figures (vide supra). In view of the fact that the subjects of the present study are representative of a normally fertile population in this part of our country, it is more likely that sperm count alone may not be so important a factor if the incidence of nonmotile and abnormal sperms is low as observed in the present study. It may be the absolute number of morphologically and physiologically normal active sperms in a specimen which may be of importance for fertility. However, the precise reason of low sperm counts observed can not be explained in view of lack of comparable studies.

The high motility observed in this study could be due to the higher pH of the specimens as the motility of the sperms is said to decrease in acidic pH (12). Obviously therefore the high pH and longer liquefaction time could be attributed to the climatic or racial factor, the implications of which are not fully known and need further elucidation.

A significant difference in liquefaction time, pH and sperm count between non-vegetarians and vegetarians has been observed in the present study (Table II). Our findings are consistant with the views and observations expressed by Arora et al. (1).

Whether diet plays any direct specific role in liquefaction time, pH and sperm count directly or it indirectly affects through hormonal influence or in some other way is fairly difficult to assess in view of scarcity of literature at hand. This has opened a fruitful field for investigation. Studies to confirm the validity of above observations is further advocated.

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