Effect of repeated semen ejaculation on sperm quality

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Summary: The semen quality of 21 Medical students who produced sperm by masturbation has been assessed. The mean density of 21 samples examined on the first day was 64,4 millions per millilitre, while that on the third and fifth day of the study period were 52.2 and 50.7 millilitre respectively. This showed a statistically significant difference between the first and the third samples.

Another statistically significant difference ($P < 0.5$) was demostrated in the semen volume of the first and third, and the third and fifth samples respectively.

Significant differences were, however, not observed in the motility and morphology changes in the group samples. We therefore conclude that even though repeated semen ejaculations on alternate days do affect the density and volume of the semen, the most important overall effect is not such as to impair the potential fertility of the man who has normal initial sperm characteristics.

Key words: semen; repeated ejaculations; density; volume; motility; morphology.

INTRODUCTION

The prevailing socio-medical circumstances in our country today where the orthodox medical practitioner competes vehemently with the traditional health workers especially in the field of infertility, makes a scientific study on infertility very relevant. Even amongst the orthodox practitioners opinions still differ on the advice given to the infertile couple as to the frequency of intercourse in order to ensure fertilisation of a released ovum.

The frequency of ejaculation may affect seminal fluid characteristics and this effect may be important where a man has several partners, as in a polygamous family, which is common in our Society. In order to assist in reaching a scientific basis for any such advice given to our population we evaluate the effect, if any, of alternate day ejaculation, in the first instance, on seminal fluid characteristics in a healthy population.

Previous studies from our Department have established the contribution of male factors to infertility in Lagos ([1, 2]), and evaluated semen parameters in a fertile male population ([3]).

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MATERIALS AND METHODS

The subjects were 21 medical students of this college of medicine, who gave their informed consent to participate in the study. They were all single and in good physical and mental health. Preliminary counselling ensured that the subjects abstained from sexual intercourse 48 hours before entering the study. Also the subjects abstained from sexual intercorse throughout the period of the study.

Table 1. – *Analytical spectrum of spermigram in the study(density and motility indices).* (63 samples).

Factors	No	Standard deviation	t value	Co-efficient of variations	Range	Remarks
1. Density						
1st Sample	64.4×10^6/ml	±23.6	1st : 2nd = 1,5	36.22	$26\text{-}95\times10^6$/ml	Statistically Significant $p<0.05$
2nd »	52.2×10^6/ml	20.4	2nd: 3rd = 0.64	37.64	$19\text{-}90\times10^6$/ml	Not statistically Significant
3rd »	50.7×10^6/ml	21.6	1st : 3rd = 1.96	42.60	$17\text{-}95\times10^6$/ml	Statistically Significant $p<0.05$
2. Motility						
1st Sample	68.3%	±11.99	1st : 2nd = 0.96	17.55	40-90%	Not statistically Significant
2nd »	63.6%	18.90	2nd: 3rd =	29.72	25-90%	– ditto-
3rd »	64.9%	16.40	1st : 3rd = 0.77	25.27	30-90%	– ditto-

Each produced sperm by masturbation three in a working week (that is, Monday to Friday).

Thus specimens were collected Monday, Wednesday and Friday in the single week of the study . The sperm collected was immediately analysed (EEE). The ejaculated volume was measured in millilitres using a graduated pipette. Sperm motility was assessed as soon as the specimen underwent liquefaction, and graded after adding a drop of freshly well-mixed specimen on a glass slide and counting the number of sperm exhibiting purposeful directional movement, out of a count of 100 sperm within an hour. The sperm density in millions was evaluated with a Neubauer haemocytometer. The total count was obtained from the product of the semen volume in millitres and sperm density in milions per millilitre. The sperm morphology was determined after vital staining. A minimum of 200 sperm were examined microscopically under oil immersion (×600) and related according to Freund's standards [5]. Normal forms were estimated as the percentage of the total sperm examined. Sperm tail abnormality was not studied as it was felt that it had no significant effects on the overall picture of sperm quality. A statistical calculation using the Student's T test was employed to evaluate the significance of our observation.

RESULTS

Twenty-one men produced sixty three sperm specimens which were evaluated. The mean age of the subjects was 22 with a range of 21 - 33 years. The mean sperm density for the series was 56.4±21.5 millions/millilitres with a range of 17-95 millions/millilitres, while that of the volume was 2.6±0.5 millilitres with a range of 1.8 to 4.0 millilitres.

The mean motility was 65.6±0.11 per cent an hour and the range was 25-90 per cent an hour. The mean abnormal forms was 10.6±0.04 per cent.

Table 1&2 show the analytical spectrum of the individual group observations and the statistical calculations obtained. It can be seen from Table 1 that the difference between the sperm density in the first day sample group and that of the second was statistically significant ($P < 0.05$). The difference between the first and third day samples was highly significant ($P<0.05$).

Table 2 shows a highly statistical significant difference when the volume of the first day samples was compared with that of the second ($P<0.05$). A statistical significant difference was also obtained when the first and the third sample groups were compared ($P<0.05$). The same si-

Table 2. – *Volume and morphology indices (63* samples).

Factors	No.	Standard deviation	t Value	Co-efficient of variation	Range	Remarks
1) *Volume*						
1st Sample	2.9 ml	±0.37	1st: 2nd=1.33	12.75	1.9-3.3 ml	Statistically significient $P<0.05$
2nd Sample	2.7 ml	0.49	2nd: 3rd=2.35	18.15	1.8-3.8 ml	Highly statistically Significant $P<0.05$
3rd Sample	2.3 ml	0.58	1st: 3rd=3.75	25.22	1.8-4.0 ml	- ditto -
2) *Abnormality*						
1st Sample	11.2%	±6.05	1st: 2nd=0.14	54.02	5-30% 3.3 ml	Not statistically significant
2nd Sample	11.0%	2.90	2nd: 3rd=0.88	26.36	4-30%	- ditto -
3rd Sample	9.6%	6.74	1st: 3rd=0.81	70.21	5-30%	- ditto -

gnificant difference was obtained when we compared the second and third samples ($P<0.05$). The abnormal components of the three group samples remained virtually unchanged. There was not statistical significant difference in the motility throughout the observation periods.

DISCUSSION

Seminal parameters are rapidly changing with a downward trend ([6]) and it has been suggested that this may be due to environmental and industrial pollution. It is now generally accepted that the previous high sperm density of 60 millions/millilitre regarded as cut-off point for normality ([7]) is rather ambitious for our present values. Nevertheless, the figures obtained in this study compare favourably with those of other recent workers. Thus the observed mean density in the series of 56 millions per millilitre while agreeing with the 55 millions per millilitre reported in the previous study from this centre ([3]) and 48 millions/millilitre by Nelson and Bunge (1974) ([8]), is markedly different from the 101 millions per millilitre by Falk and Kaufman ([9]), 107 millions/millilitre by Macleod and Gold ([10]), and 145 millions/millilitre by Farris ([11]). Repeated semen ejaculation reduces the density of the sperm and it would seem that the downward trend in progressive. Yet the value obtained in each case remains within the accepted normal range of 20 millions per millilitre and above ([3]) (Table 1).

It would also appear from our study that alternate day sperm emission affects the volume to a large extent and the motility to a lesser extent. All in all, however, the effect in the various indices examined is not severe enough to impair the potential fertility of the man who has a well above normal value initially.

Freud (1963) reached a similar conclusion when he studied the effect of alternate and daily semen ejaculations among the Caucasians, but submitted, as we do here, that such a practice may impair sperm capacitance of a patient whose sperm characteristics are already compensated.

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