Indian J Physiol Pharmacol 1998; 42(1): 144-146

SHORT COMMUNICATION

ASSESSMENT OF SPERM COUNT IN RURAL POPULATION OF CENTRAL INDIA

RAMJI SINGH*, A. R. CHAUDHARY AND S. BHUNIA

Department of Physiology, Mahatma Gandhi Institute of Medical Sciences, Sevagram, Wardha - 442 102

(Received on May 3, 1997)

Abstract : Semen samples from 1425 males who visited the Reproductive Biology Unit, M. G. I. M. S., Sewagram during the period from 1984 to 1996 were analysed. The data for sperm count was analysed over the length of period and no change in sperm count was found with passage of time.

Key words :	total sperm concentration	motile sperm concentration
	rural population	sperm count

INTRODUCTION

The controversy over sperm count and quality deterioration has drawn the attention of Reproductive Biologists and general population. It began with a metaanalysis by Carlson et al (1), which showed a decline in sperm count from 113×10^{6} /ml to 66×10^{6} /ml between 1940 and 1990. These findings were supported by Auger et al (2) in a study of 1351 fertile men in Paris. Recently Irvine et al (3) have shown decreased semen quality in men in U. K. However, Bujan et al (4) reported that sperm concentration is unchanged in a small town of Toulouse area.

Several hypothesis have been suggested to explain this decrease in sperm quality, for example, environmental exposure to harmful compounds like high concentration of nitrogen oxide in air, oxidizable waste in water or compounds with similar activity. Moreover, the analysis of semen samples done in urban and densely populated area show deterioration in semen samples as compared to the analysis undertaken in rural area and small township.

Considering these facts we analysed data of semen samples collected over 13 years in our Reproductive Biology Unit catering mainly rural population of Central India.

METHODS

Subjects were persons coming for semen analysis in the Reproductive Bioloigy Unit, Department of Physiology, MGIMS, Sevagram. Only normospermic men were

*Corresponding Author

Indian J Physiol Pharmacol 1998; 42(1)

Sperm Count in Rural Population 145

selected for the study. Mean age of the subjects were 31.77 ± 5.08 years at the time of sample collection.

Sperm count was done by Neubaur's chamber and later by Makler's counter. All samples were analysed in one laboratory. The normal reference range was that defined for our local population (Sperm Concentration > $=20 \times 10^6$ /ml and overall motility >=50%) and remain unchanged throughout the study.

RESULTS

We included 1425 persons in the study. All lived in a small town or village area. Mean age at the time of sample collection was 31.77 ± 5.08 years (ranging between 18 to 43 years). It remained unchanged during the study from 1984 to 1996 (Table I). There is no significant difference in sperm count in subjects of different age group (Table II). Low sperm count in first group could not be compared as it has only 8 subjects.

TABLE	Ι	: Spern	count	(millions/ml)	between	1984	and	1996.	
-------	---	---------	-------	---------------	---------	------	-----	-------	--

Year	No. of subjects	Mean age ± SD	Total sperm count ± SD	$\begin{array}{c} Motile \ sperm \\ count \pm SD \end{array}$
1984	129	30.5 ± 5.12	51.5 ± 23.68	39.6 ± 20.21
1985	132	31.6 ± 5.16	55.4 ± 23.71	42.4 ± 21.00
1986	128	32.0 ± 5.00	55.2 ± 23.70	43.3 ± 21.78
1987	120	31.4 ± 5.16	52.0 ± 23.12	40.7 ± 20.81
1988	208	30.2 ± 5.02	56.8 ± 26.20	44.0 ± 23.70
1989	112	33.8 ± 5.21	51.3 ± 22.68	42.2 ± 21.92
1990	99	34.2 ± 6.00	52.2 ± 24.20	43.4 ± 23.00
1991	78	32.4 ± 5.72	52.6 ± 24.00	43.6 ± 23.48
1992	76	33.2 ± 5.81	51.2 ± 23.31	40.7 ± 21.97
1993	55	31.6 ± 4.93	50.5 ± 22.98	40.3 ± 21.97
1994	96	29.5 ± 4.67	54.3 ± 24.44	41.3 ± 23.68
1995	93	31.7 ± 5.11	55.7 ± 25.68	43.3 ± 23.00
1996	99 -	31.0 ± 4.98	54.0 ± 25.12	41.7 ± 22.68

TABLE II : Total and motile sperm count (millions/ml) in different age groups.

Age (years)	No. of subjects	SC (Mean ± SE)	MSC (Mean ± SE)
< 20	8	33.75 ± 6.88	18.94 ± 5.51
20 -	73	46.45 ± 2.69	33.35 ± 1.06
25 -	399	42.40 ± 1.18	30.28 ± 1.06
30 -	399	44.22 ± 1.62	30.03 ± 1.08
35 -	202	44.42 ± 1.89	31.64 ± 1.50
40 +	63	47.48 ± 2.50	34.11 ± 2.37

146 Singh et al

Mean \pm SD total sperm count of the samples was $53.23 \pm 24.06 \times 10^6$ /ml while mean \pm SD motile sperm count was $42.04 \pm 22.17 \times 10^6$ /ml. The trend of sperm count in our study does not show any change (Fig. 1).



Fig. 1: Average total and motile sperm count between 1984 and 1996.

DISCUSSION

In agreement to the results shown by Bujan et al (4) we also did not observe any decrease in the total and motile sperm count in semen collected between 1984 and 1996 in rural population. The decreasing trend in sperm count observed in the study done by Carlson et al (1), Auger et al (2) and Irvine et al (3) is not evident in our study.

Ginsburg et al (5) have reported that difference in sperm count among men living in the London area were found to reflect differences in the water supply. Bujan et al (4) explain the differences in their finding as compared to other studies done in urban areas of Paris and U.K., may be due to difference in environmental conditions as the two areas differed in air quality, water supply and matters of lifestyle (such as time spent in commuting and stress factors). High concentration of nitrogen dioxide in air, industrial pollution as emission of oxidizable waste in water and production of sulphur dioxide are some of the factors responsible for industrial pollution in Paris.

However, sperm counts could also be affected by many other environmental factors like greenhouse effect, global warming (I.S. Tummon & David Mortimer, 1992) as well as behavioral factors which need further studies on environmental conditions and male reproductive function. Thus it appears, considering the vary fact that the area of study in Bujan et al (4) and our study environment has a greater role in changing sperm quality.

REFERENCES

- Carlson E, Giwercman A, Keiding N, Skakkeback NE. Evidence of decreasing quality of semen during past 50 years. *BMJ* 1992; 305: 609-613.
- Auger J, Kunstmann JM, Czyglik F, Journet P. Decline in semen quality among fertile men in Paris area during the past 20 years. N Engl J Med 1995; 332: 281-285.
- Irvine S, Cawood E, Richardson D, MacDonald E, Carlson E, Aitkan J. Evidence of deteriorating semen quality in the United Kingdom: birth cohort study in 577 men in Scotland over 11 years. BMJ

1996; 312: 467-470.

- Bujan L, Mansat A, Pontonnier F, Mieusset R. Time series analysis of sperm concentration in firtile men in Toulouse, France, between 1977 and 1992. BMJ 1996; 312: 471-472.
- Ginsburg J, Okolo S, Prelevic G, Hardiman P. Residence in the London area and sperm density. Lancet 1994; 243: 230.
- Tummon IS, Mortimer David. Decreasing quality of semen. BMJ 1992; 305: 1228-1229.