

Original Article**Semen analysis: Study of hundred samples of semen, in association with different epidemiological parameters, from cases of male infertility**

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ABSTRACT

BACKGROUND: Infertility is social stigma. Male infertility also has significant contribution in Toto. Different habits among males i.e. smoking, tobacco chewing and alcohol intake have found adverse influence on sperm count and sperm motility.

AIMS AND OBJECTIVES: To identify the role of smoking, tobacco chewing and alcohol in decreasing sperm count or motility.

MATERIALS AND METHODS: Total 100 semen samples from the case of male infertility reported at C U Shah Medical College & Hospital were taken in this study. The results of alcoholics, tobacco chewers and smokers were studied and compared according to WHO guidelines, to that of non-alcoholics and non-smokers.

RESULTS: Of 100 samples 68 showed decreased sperm count of which 39 men were chronic smokers, 26 men tobacco chewers and none drank chronically. 38 out of 100 samples showed decreased progressive motility, of which 21 men were addicted to either tobacco chewing or smoking.

CONCLUSION: Smoking and tobacco chewing have a role in deteriorating the sperm quality and therefore in infertility of the male partners.

Key words: Infertility, Sperm count, Sperm motility, Smoking, alcohol, Tobacco chewing.

INTRODUCTION

Besides general physical status, genetics, hormones and accompanying illnesses, routine semen examination remains the principle index of fertility evaluation in males. Modern lifestyle and urbanization have been implicated as the factors responsible for male infertility. Semen analysis, at the same time being a very simple and fundamental test, remains the key investigation to study their impact in cases of male infertility. Studies have examined the effects of tobacco smoking and alcohol consumption on human seminal quality. It is likely that smoking adversely affects male reproductive health [1]. Studies have found an association between alcohol consumption and semen quality [2].

MATERIALS AND METHODS

Study population: Total 100 cases of clinically diagnosed male infertility, reported at C U Shah Medical College and Hospital were included in this study. The age group of cases was 30 – 45 years. Exclusion criteria were; previous disease or surgery associated with reproductive function (including varicocele, cryptorchidism, epididymitis, mumps,

Azoospermia); vasectomy and vasectomy reversal. Participants were questioned regarding their careers, alcohol consumption, smoking habits, and medical and family histories

Study groups: Study group were compared for two characteristics one is for number of sperm count and other is for motility. For normal comparison WHO criteria [3] were taken into consideration. Those who had smoked or chewed tobacco for ≥ 12 months were considered chronic smokers or tobacco chewers respectively.

Semen analysis: Samples collected in sterile containers were analyzed, primarily for fructose, sperm count and motility of the sperm. Examination was done via light microscopy. And results were compared to the WHO standards. Motility was assessed using the sperm progression rating:

- A, Rapid forward progressive motility;
- B, Slow or sluggish progressive motility;
- C, Nonprogressive motility;
- D, Immobility.

Statistical analysis: The data was processed with simple statistical analysis and p value was calculated. *P*-value < 0.05 was considered statistically significant.

WHO criteria for normal semen were taken as reference value [3]

Liquefaction	Complete in 60min
Volume	1.5ml
Color	Opalescent white
pH	>7.1
Concentration (ml)	15 million
Progressive motility	32%
Vitality	58%
Morphology	4%
Leukocytes (ml)	< 1 million
Mar test	<50% sperm with bound particles

RESULTS

Table 2 shows that out of 100 samples studied 68 showed decreased sperm count, of which 41 were addicted to either smoking or tobacco, 39 were chronic smokers, 26 chronic tobacco chewers, of them 24 smoked and chewed both and no one drank. Only 27 men were free of addiction.

Table 2 reveals that 38 samples showed decreased progressive motility of the sperm, of which 25 were addicted to either smoking or tobacco chewing in 100 tested samples

Table 2: Distribution according to sperm count

Relation of sperm count and tobacco addiction	Low sperm count n=68	Normal sperm count n=32	Total
Chronic smoker	39	13	54
Chronic tobacco chewer	26		
Free of addiction	27	19	46
Total	68	32	100

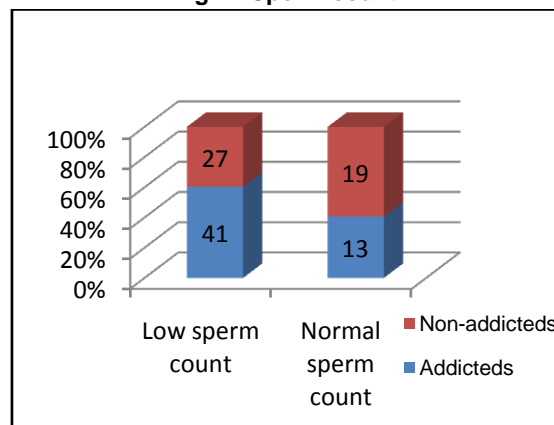
Table 3: Distribution according to motility

Relation of sperm motility and tobacco addiction	Low motility N=38	Normal motility	Total
Chronically addicted	25	29	54
Free of addiction	13	33	46
Total	38	62	100

DISCUSSION

Patterns of male fertility vary greatly among regions and even within regions. A combination of social habits e.g. cigarette smoking, environmental conditions, and genetics is suspected to contribute to this variation (Kidd et al., 2001) [4]. According to the World Health Organization (2002), approximately one-third of the world's male adult population (above 15 years of age) smokes. The combustion of tobacco yields about 4000 chemical compounds, some of which are deadly toxic. Given that cigarette smoke contains more than 30 compounds known to be mutagens, or carcinogens such as "radioactive polonium, benzo(a)pyrene, dimethylbenz(a)anthracene, dimethylnitrosamine, naphthalene, and methyl naphthalene" which have a direct deleterious effects on human embryos and female and male germ cells are probable (Zenzes,2000) [5].

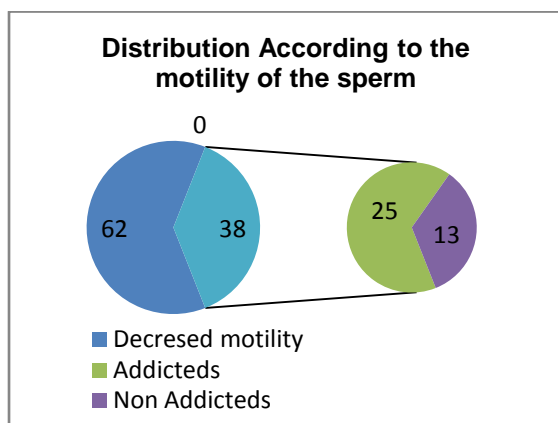
Fig. 1: Sperm count



In a retrospective comparative study Coelho et al. (2009) [6] analyzed the effects of cigarette consumption on semen parameters of 327 men in Portugal. The semen parameters were first compared between smokers and nonsmokers and then a heavy smokers/light smoker's analysis took place. A total of 135 (41%) were smokers and 55 (40.7%) were heavy smokers. The demographic characteristics were similar between groups. The tobacco use was associated with an increased incidence of oligo/zoosperm, without difference in the other semen parameters. It was also noted a negative correlation between heavy smoking habits and semen volume abnormalities. Nicotine has been shown to increase the free radicals in the sperm. At the same time it also increases the susceptibility of the sperm to free radicals. Alcohol consumption is associated with an increase in morphologically abnormal sperm [7]. This in turn also affects the motility of the sperm, which is pivotal in fertility.

In this study a significant difference ($p=0.008$) is seen in addicted and non- addicted in terms of semen quality. The present result showed that the majority of cases were cigarette smokers and around half of them smoked more than 20 cigarette/day. In addition, more than half of the cases smoked for 5-15 years.

Fig. 2: Sperm Motility



These results are in agreement with that found by Collodel et al [8] (2009) who demonstrated that the sperm motility, sperm concentration, and fertility index decreased and the percentage of sperm pathologic features increased as the number of cigarettes smoked daily increased. According to Centers for Disease Control and Prevention (2009) [9], sperm from chronic smokers were 75 % less fertile than sperm from nonsmokers.

CONCLUSION

Smoking or nicotine addiction has significant negative relation with sperm count as well as motility in adult males.

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