



To Study The Impact of Cigarette Smoking on Semen Quality of Adult Males

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ABSTRACT

Background: To assess the effect of cigarette smoking on semen parameter viz sperm volume, count, motility & morphology among adult males.

Methods: Present work is carried out in 228 males of C.C.M. medical college Durg C.G. randomly between April 2016 to July 2016 & were divided into two groups. Group 1 (nonsmokers n=140) & Group 2 (smokers n=88) represents 36.6%. Semen obtained by masturbation after 3-5 days period of abstinence, examined for its volume, sperm count per ml, sperm count per ejaculate, percentage of motile sperm, & percentage of normal morphology spermatozoas in above two groups.

Result: Total 228 adult male were taken in study, belongs to 21-40 years of age. The nonsmokers (n=140) were with mean age of 34.40 ± 5.88 (mean \pm SD). The smokers (n=88) have mean age 33.27 ± 4.74 (mean \pm SD). There was significant effect of cigarette smoking on sperm count, motility & morphology. Group of smokers found lower sperm count, motility, with increased abnormal morphology spermatozoas.

Conclusion: Cigarette smoking has adverse effect on various parameter of seminal fluid & may have future effect on fertility potential of person.

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Introduction

In the last 50 years there is significant reduction in semen parameter quality due to change in life style of persons, environmental factors like diet, obesity, smoking, alcohol intake & EMWs from cell phone users which affects testicular tissue structure & function either due to thermal or nonthermal effect.[1] Besides this cigarette smoking has deleterious effect on many system of body including respiratory & cardiovascular system. These environmental factors are important because it is preventable & one can improve the fertility potential in early reproductive life, by quitting the smoking. Male infertility contributes 40% worldwide.

Various study reveals cigarette smoking has impact on male as well as on female infertility.[2] Cigarette smoking is increasingly reaching to 1/3 of world population above 15 years of age, despite knowing its injurious effect.[3] Government has taken adequate measures to aware & alert the peoples for its hazardous effect but has no fruitful outcome.

Quantity & prevalence of cigarette smoking is highest up to 50% in Zordon as compare to developed nations.[4]

Cigarette smoking contains large numbers of carcinogens like radioactive polonium, cadmium, benzopyrene, dimethylbenzathracene, dimethyl nitrosamine naphthalene, methnaphthelene. The exact effect on function of spermatozoa is not assessed yet, though the effect is noticed a long time ago. The mechanism of effect on sperm is not also understood till date.[5] So the impact of cigarette smoking & semen characteristics is still unresolved.[6]

Cigarette smoking may be associated with impaired fertility in male & may lead to decrease in sperm count, motility & reduced percentage of morphologically normal sperms.[7]

Regarding effect of smoking on semen quality many studies done worldwide[8] showed smoking results in impaired sperm count, motility & normal morphology sperms.[9] Some shown that smoking has detrimental effect on sperm quality.[10] where as in another study the results are inconsistent & inconclusive.[8]

The present study is conducted to asses effect of cigarette smoking on semen volume, count, motility & its morphology.

Materials and Methods

The present study is conducted in the department of pathology C.C.M. medical college Durg C.G. where semen analysis of persons done randomly, belongs to age group between 21-40 years. Study were done from April

2016 to July 2016. Exclusion critaria used here are males with varicocoele, undescended testis , azoospermia, H/O trauma, scrotal surgery or chronic illnesses like diabetes, hypertenstion, tuberculosis or malignancy.

In our study 228 males were included. Out of which 140 were nonsmokers & 88 were smokers. Quantity of smoking is varies from 2 to 20 cigarettes per day & from period 5 years to 10 years. Semen collected in sterile wide mouth plastic container after 3-5 days of abstinence, near the laboratory. Semen is allow to liquify before analysis. Routine analysis done at R.T. as per the guide line of WHO. [11] Volume of semen is measured by aspirating semen in pipette, sperm count per ml done by neubauer chamber after diluting 1:20 with D.W., determination of sperm count in whole ejaculate done by multiplying the sperm count per ml by total volume of sample, motility is done by placing one drop of semen in glass slide, cover it with cover slip & morphology is studied by pap staining. Datas are analysed checked & expressed as mean \pm SD . A P value of < 0.05 considered significant.

Result

Out of total 228 adult males range between 21-40 years, 140 nonsmokers with a mean age of 29.96 ± 5.80 , while smokers are 88 with mean age of 29.01 ± 5.72 . Table 1 shows different parameter of semen sample such as volume, count, motility, morphology & other cells.

In both the group there were no significant difference between volume of semen & age, whereas as per figure 1 the sperm count per ml & percentage of motile sperms is lower in group 2 smokers (85.94 millions & 68.75%) as compare to group 1 nonsmokers (92.19 millions & 73.75%). Grade of motility is different in both the group. Group 1 nonsmokers have many actively motle sperms. Sluggishly motile spermatozoas seen equivocally in both group. Immotile sperms seen in smokers. As per figure 2 normal morphology sperm was significantly lowered in smokers (64.46%) as compare to nonsmokers (69.14)

Table 1: Showing the mean values and standard deviation, along with P-values for Unpaired T test in group 1 and group 2. (* p < 0.05)

	Group 1 Mean \pm S.D.	Group 2 Mean \pm S.D.	P Value
Age	29.96 \pm 5.80	29.01 \pm 5.72	0.48
Volume	3.30 \pm 0.48	3.21 \pm 0.52	0.18
Sperm	92.19 \pm 8.88	85.94 \pm 5.82	0.00
Motile	73.75 \pm 7.10	68.75 \pm 4.66	0.00
Morphology	69.14 \pm 6.66	64.46 \pm 4.36	0.00

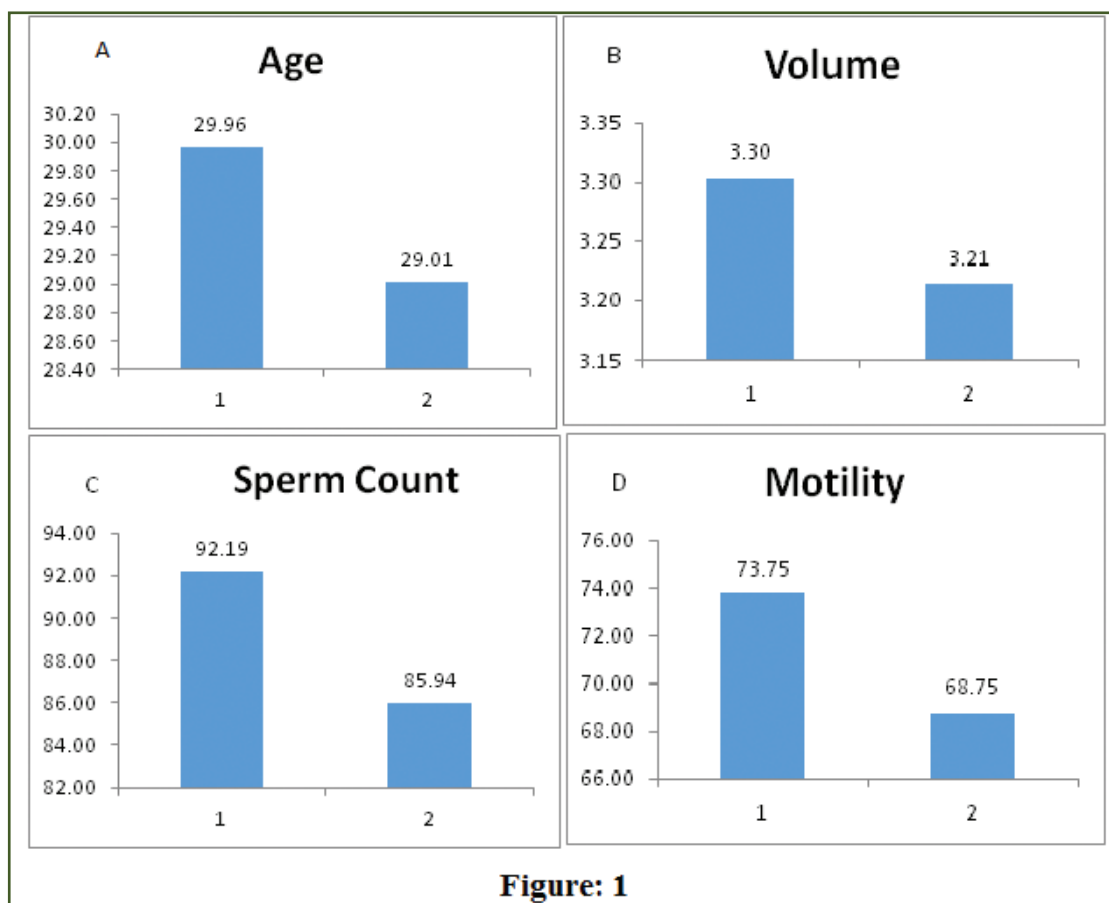


Fig. 1: A mean sperm count millions/ml, B mean Volume Semen, C mean sperm Count, D mean percentage of motility sperm in group 1 & 2.

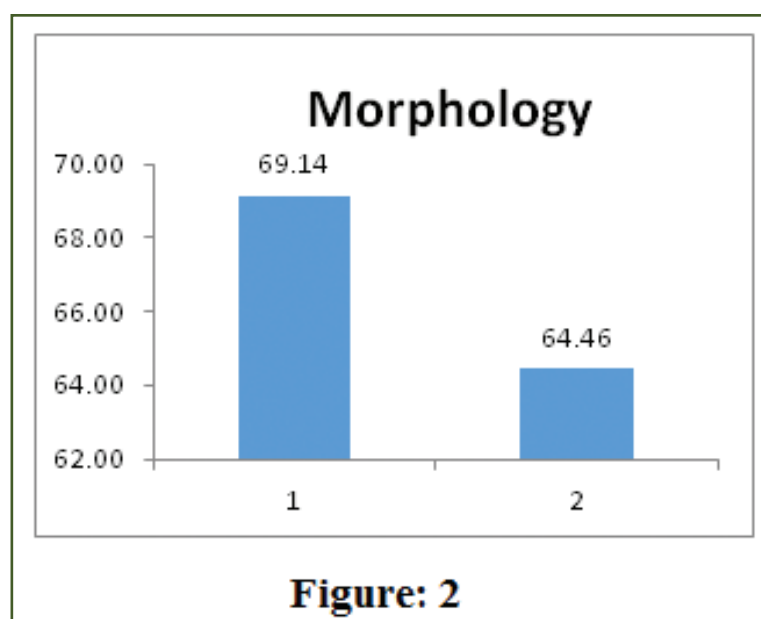


Fig. 2: Mean percentage of normal morphology sperm in Group 1 & 2.

Discussion

Several studies explored the adverse effect of smoking on sperm production, motility, its morphology (2). Smokers contribute 38.59% (n=88) in this study. Figure 1 showing results of study indicating that cigarette smoking affects sperm motility & leads to decreased active motility (68.75% vs 73.75%). The number of immotile sperms increased in this group. This finding is tallied with the finding of earlier studies related to relationship between cigarette smoking & sperm motility [12]. However, our results are not matching with result of Ozgur et al. [13] who stated that there were no change in semen parameter among smokers & nonsmokers.

Our reports are also not consistent with finding of Collodol et al. [14] showed no significant difference in sperm motility between smokers & nonsmokers. As per figure 1 our finding of sperm morphology negatively affected by smoking (64.46% normal morphology sperms in smokers as compared to 69.14% in nonsmokers) is same as reported by Kuzle et al & Collodol et al. [10][14]. Volume of semen is comparable with both the groups, similar to a study done by Trummer et al. [15] who found no difference in semen parameter between smokers & nonsmokers.

Conclusion

Cigarette smoking has injurious effect on semen quality like sperm count, its motility, morphology with its subsequent impact on male fertility. It is a preventable environmental factor, so one can quit the smoking & improve the male fertility.

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Competing Interests

None

Reference

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