



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.2916512>Available online at: <http://www.iajps.com>

Research Article

**IMPACTS OF SMOKING ON THE QUALITY OF SEMEN OF  
STERILE MALES**<sup>1</sup>Dr Zain Ul Abdin Khalid, <sup>2</sup>Dr Muhammad Mughees Anjum,<sup>3</sup>Dr Muhammad Faisal Naemi<sup>1</sup>Allied Hospital Faisalabad.**Article Received:** March 2019**Accepted:** April 2019**Published:** May 2019**Abstract:**

**Objective:** The aim of this research work is to assess the impacts of habit of cigarette smoking on the quality of semen on sterile or infertile males.

**Methodology:** Total 214 males with infertility with addiction of cigarette smoking and 130 males with infertility but not addict of cigarette smoking were the part of this research work. The examination of volume of semen, concentration of sperms, and motility of sperms, viability & morphology carried out. 75 males with infertility and non-smoker having the age of twenty-five to forty years with having their children were performing the role of healthy controls in this research work.

**Results:** Majority of the parameters of the semen in the people who were smoking from a long duration were very low in comparison with the values of these parameters in the non-smokers. The findings of this research work showed that spermatozoa quality obtained from smokers was lower in comparison with the non-smokers. The concentration of the sperms, sperms viability & progression to move further found with negative correlation with the members of smokers of cigarette.

**Conclusions:** The results of this research work conclude that there are clear impacts of cigarette smoking on the quality of semen of sterile males. There are many toxins present in the smoke of cigarettes. There are many dangerous impacts of those toxins on the fertility of males. The stop of the cigarette smoking is the best way for the preventions of various toxins present in the smokes of cigarettes.

**Keywords:** Sterile, Cigarette, Motility, Sperm, Viability, Spermatozoa, Concentration, Progression, Non-Smokers.

**Corresponding author:**

Zain Ul Abdin Khalid,  
Allied Hospital Faisalabad.

QR code



Please cite this article in press Zain Ul Abdin Khalid et al., *Impacts of Smoking on the Quality of Semen of Sterile Males.*, Indo Am. J. P. Sci, 2019; 06(05).

**INTRODUCTION:**

There are many campaigns in the whole world against smoking but this habit is very frequent in the whole modern world. Some of the experimental research works displayed that in the rats were facing smoking exposure, nicotine & cotinine levels of serum were very high which were the main reason of adverse impacts on spermatogenesis & the potential of sperm fertilizing [1, 2]. In accordance with the clinical research works on association between smoking & reproduction of the males, the results of the data on this subject found without appropriate conclusions or findings.

The smoking of cigarette can have an association with the sub fertility in the males and it may become the cause of reduced concentration of sperms, low value of motility of sperms and a decreased ratio of the normal sperms morphologically [3, 4]. Some research works have concluded that the relationship between the quality of semen and cigarette smoking was very strong in the healthy males in comparison with the infertile of sterile males of our communities [5, 6]. The aim of this research work was to assess the impacts of cigarette smoking on the quality of sperms among the males who were permanently visiting the health care center related with infertility.

**METHODOLOGY:**

The study was conducted in Allied Hospital Faisalabad. Males having the age of twenty-five to forty-five years were the part of this research work. Total 130 participants were not smokers and 234 were the smokers. All these patients were the victim of infertility but these patients were able to ejaculate. Evaluation of these three hundred and forty-four patients of infertility carried out in this research work. All the participants of this current research work found with no urogenital disorder of serious disease of this system. All the patients never used any sex power drugs. Spouses of those males were females with full fertility in accordance with the examination of the laboratory and physical checkups, 75 males with infertility and non-smoker having the age of twenty-five to forty years with having their children were performing the role of healthy controls in this research work.

The categorization of the smokers carried out in three groups;

1. Mild smoker was smoking ten or less cigarettes in a day,
2. Moderate smokers were smoking more than ten and equal or less than twenty cigarettes in a single day,
3. Heavy smokers were smoking more than twenty cigarettes in a single day.

We also divided the smokers in accordance with their total duration of smoking;

1. For short term smokers the duration was from one to ten years,
2. For long term smokers the duration was eleven to twenty years.

All the patients masturbated to provide the samples of their semen. The semen placement performed in a clean container for sample. We took the samples from those patients who had no sex within 3 days. We evaluated the samples of semen in accordance with the instructions of World Health Organization [7]. The measurement of the volume of the ejaculation, pH value and duration of liquefaction carried out. All the findings and outcomes of the analysis of the semen were secret to maintain the confidentiality of the patients [7]. The diagnosis of normozoospermia carried out when the concentration of the sperms, sperm's motility & morphology all were in the reference limit values. The reference grade for the concentration of the sperm was greater than fifty percent sperm with progression to forward of greater than twenty-five percent sperm with the movement of category a & for morphology thirty percent sperm having the ideal morphology correspondingly. The disparities between different values were under analysis with the utilization of T test. SPSS V. 7.5 was in use for the statistical analysis of the collected information. The P value, which was significant for the disparities was less than .050.

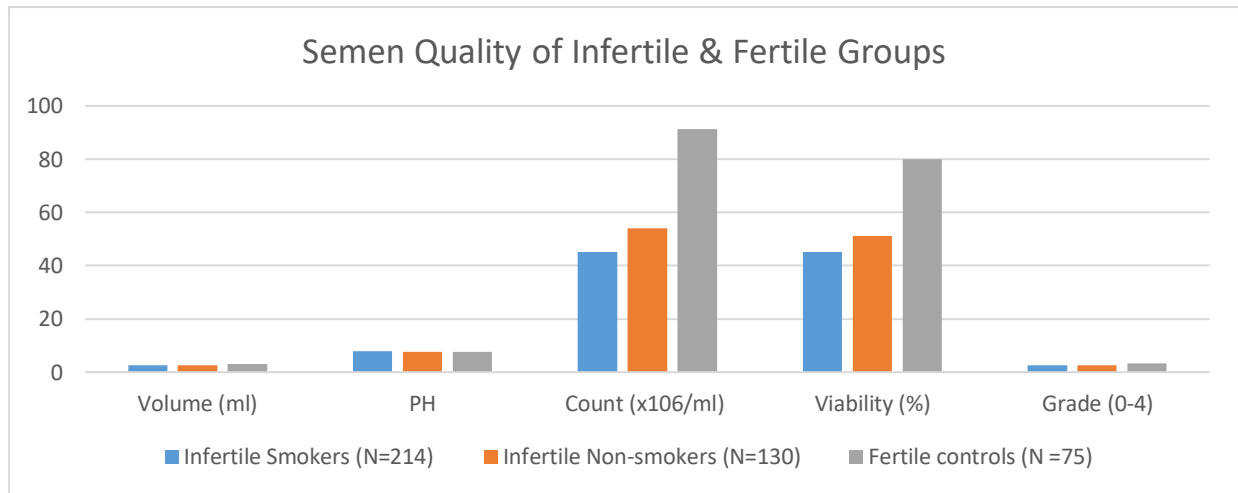
**RESULTS:**

We evaluated total 344 males to check their infertility, among total patients, there were 130 non-smokers and 214 were the addict of cigarette smoking. The results of this research work showed that, the volume of semen, the concentration of the semen, viability of semen & progression to forward was very low among the people who were smokers in comparison with the peoples who were non-smokers as elaborated in Table-1.

**Table-I: Semen Quality of Infertile and Fertile Groups**

Semen	Infertile Smokers (N=214)	Infertile Non-smokers (N=130)	Fertile controls (N =75)
Volume (ml)	2.50±0.080	2.70±0.070	3.0±0.090
PH	7.80±0.020	7.70±0.020	7.60±0.030
Count (x10 <sup>6</sup> /ml)	45.20±1.70	54.040±2.50	91.30±3.50
Viability (%)	45.20±1.80	51.10±2.10	80.0±1.20
Grade (0-4)	2.50±0.040	2.70±06.0	3.20±0.030

Note: All values are means±SD. P<0.01



The parameters of semen were very low in the infertile males who were non-smokers in comparison with the males with fertility.

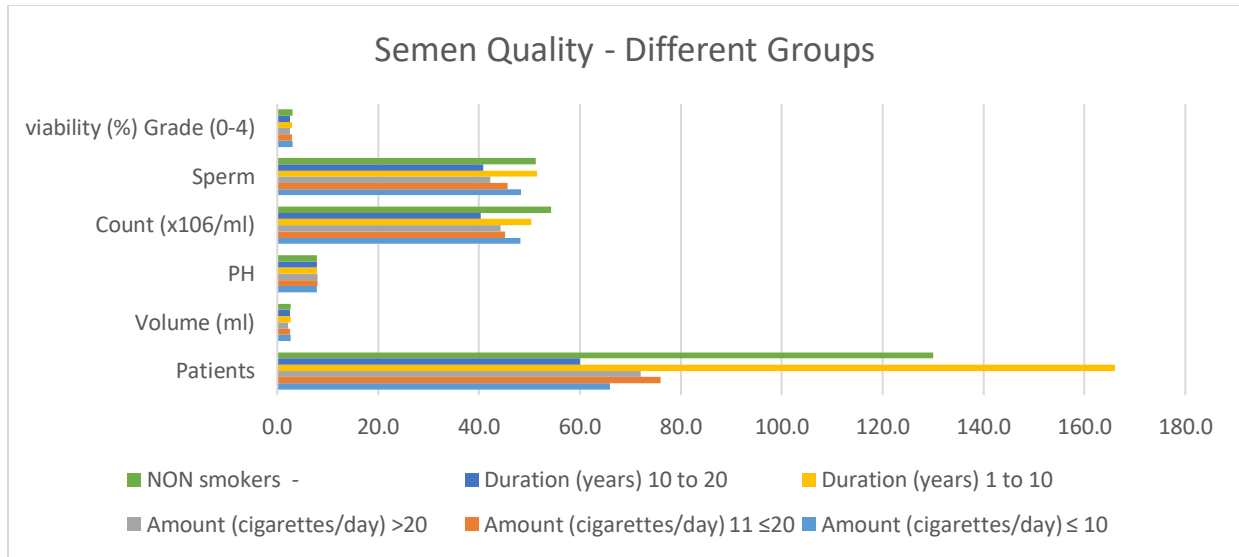
We did not see any important disparity in the findings of quality of semen between mild, moderate or

smokers for small periods and the people who were non-smokers. Majority of the parameters of the semen in the people who were smoking from a long duration were very low in comparison with the values of these parameters in the non-smokers as described in Table-2.

**Table-II: Semen Quality of Different Group**

Semen Analysis	Amount (cigarettes/day)			Duration (years)		NON smokers
	1 to 10	11 to 20	>20	1 to 10	10 to 20	
Cigarettes	1 to 10	11 to 20	>20	1 to 10	10 to 20	-
Patients	66.0	76.0	72.0	166.0	60.0	130.0
Volume (ml)	2.60±0.080	2.50±0.20	2.20±0.10*	2.60±0.060	2.50±0.10	2.70±0.080
PH	7.90±0.020	7.950±0.020	7.940±0.010*	7.90±0.010	7.90±0.020	7.85±0.02
Count (x10 <sup>6</sup> /ml)	48.20±2.20	45.10±2.0*	44.20±3.0*	50.40±2.0	40.30±4.20*	54.30±3.040
Sperm	48.30±3.20	45.70±3.10*	42.20±2.10*	51.50±1.90	40.80±4.30*	51.30±3.10
Viability (%) Grade (0-4)	3.0±0.020	2.90±0.020	2.50±0.030*	2.90±50.080	2.530±0.060*	2.980±0.090

\* p<0.01, p<0.05



### DISCUSSION:

There are many harmful impacts of smoking of cigarette on the performance on the productivity of the males, particularly on the different parameters of semen. This topic is very interesting and the available data on this subject is very conclusive [8-12]. There is a current wish to understand this issue in better way and for the treatment of the sterility of the males, it is very vital to evaluate the probable side impacts of the smoking of cigarettes on the reproduction of the males [11-13]. Mutagens or various chemical ingredients have the ability to impact the reproduction of males with their direct impact on testes as well as the ability of sperm to make sperm which is spermatogenesis (It is the process of sperm formation in testes) [13-16].

These procedures may include the control of the hormones of spermatogenesis or they have the ability to affect the germ directly as well as cells of sertoli inside the tubules of somniferous [11, 13, 17, 18, 19-21]. There are some opposite proofs, a quantity of the research works has displayed the high occurrence of sperm cells with abnormal shape as well as less or reduced motility of sperms and concentration of sperm cells in the males who are addict of smoking [9, 11, 16, 22-26]. In this recent research work, we examined the impacts of cigarette smoking on the quality of semen among males suffering from infertility especially heavy or smokers from longer periods.

### CONCLUSION:

The findings of this research work showed that smoking was the reason of the decreased volume of ejaculation. We should encourage every smoker to stop the act of smoking, particularly during the planning about pregnancy. There are many toxins

present in the smoke of cigarettes. There are many dangerous impacts of those toxins on the fertility of males. To avoid the cigarette smoking is the best way for the preventions of various toxins present in the smokes of cigarettes.

### REFERENCES:

1. Sofikitis N, Miyagawa I, Dimitriadis D, Zavos P, Sikka S, Hellstrom W. Effects of smoking on testicular function, semen quality and sperm fertilizing capacity. *J Urol* 1995; 154:1030-4.
2. Zimaman J, Brown C, Selevan G, Clegg D. Semen quality and human fertility: a prospective study with healthy couples. *J Androl* 2000; 21:145-53.
3. Vine F. Smoking and male reproduction: A review *Int J Androl* 1996; 19:323-37.
4. Yamamoto Y, Isoyama E, Sofikitis N, Miyagawa I. Effects of smoking on testicular function and fertilizing potential in rats. *Urol Res* 1998; 26:45-8.
5. World Health organization. Laboratory manual for the examination of human semen and sperm cervical mucus interaction. 3rd/ed. Cambridge: Cambridge University Press; 1992.
6. Reddy A, Sood A, Rust PF, Busby JE, varn E, Mathur RS, et al. The effect of nicotine on in vitro sperm motion characteristics. *J Assist Reprod Genet* 1995; 12:217-23.
7. Stillman J. Smoking and reproduction. *Fertile Steril* 1986; 46:545-66.
8. Handelsman J, Conway J, Boylan M, Turtle R. Testicular Function in sperm donors: Normal ranges and the effects of smoking and varicocele. *Int J Androl* 1984; 7:369-82.

9. Lewin A, Gonen, O, Orvieto R, Schenker J. Effect of smoking on concentration, motility and zonafree hamster test on human sperm. *Arch Androl* 1991; 27:51-4.
10. Karagouniscs, Papanikolav A, Zavous M. Semen parameters compared between smoking and nonsmoking men: smoking intensity and semen parameters. *Infertility* 1985; 8:373-9.
11. Hoidas S, Williams E, Tocher L, Itargreave B. Scoring sperm morphology from fertile and infertile cigarette smokers using the scanning electron microstope and image analysis. *Fertile Steril* 1985; 43:595-8.
12. Kulikauskas V, Blaustein D, Ablm RJ. Cigarette smoking and its possible effects on sperm. *Fertile Steril* 1985; 44:526-8.
13. Fisher- fischbein J. The effects of pharmaceuticals, enviromental, and occupational aspects on sperm motility. In Gagnon C, editor. *Controls of sperm motility: biological and clinical aspects*. Boca Raton (FL): CRC Press, 1990.
14. Klaiber L, Broverman M, Pokoly B, Albert J, Howard J, Sherer F. Interrelationships of cigarette smoking, testicular varicoceles, and seminal fluid indexes. *Fertile Steril* 1987; 47:481-6.
15. Mattison DR. The effects of smoking on fertility from gametogenesis to implantation. *Environ Res* 1982; 28:410-33.
16. Ozgur K, Isikoglu M, Seleker M, Donmez L. Semen quality of smoking and non-smoking men in infertile couples in a Turkish population. *Arch Gynecol Obstet*. 2005;271(2):109-12.
17. Ravenholt RT. Circulating mutagens from smoking. *N Engl J Med* 1982; 307:309-12.
18. Corrao A, Guindon E, Sharma N, Shokoohi F. Tobacco control country profiles. American Cancer Society, Atlanta 2000;32.
19. Kunzle R, Mueller MD, Hanggi W, Birkhauser MH, Drescher H, Bersinger NA. Semen quality of male smokers and nonsmokers in infertile couples. *Fertil Steril*. 2003;79(2):287-91.
20. Klaiber L, Broveman M. Dynamics of estradiol and testosterone and seminal fluid indexes in smokers and non-smokers. *Fertile Steril* 1988; 50:630-4.
21. Ramlau-Hansen CH, Thulstrup AM, Aggerholm AS, Jensen MS, Toft G, Bonde JP. Is smoking a risk factor for decreased semen quality? A cross-sectional analysis. *Hum Reprod* 2007;22(1):188-96.
22. Gaur DS, Talekar M, Pathak VP. Effect of cigarette smoking on semen quality of infertile men. *Singapore Med J* 2007;48(2):119-23.
23. Pasqualotto FF, Sobreiro BP, Hallak J, Pasqualotto EB, Lucon AM. Cigarette smoking is related to a decrease in semen volume in a population of fertile men. *B J Urology Int* 2006;97(2):324-6.
24. Rantala L, Koskimies L. Semen quality of infertile couples comparision between smokers and monsmokers. *Andrologia* 1986; 1:42-6.
25. Saaranen M, Suonio S, Kauhanen O, Saarikoski S. Cigarette smoking and Semen quality in men of reproductive age. *Andrologia* 1987; 19:670-6.
26. Martini AC, Molina RI, Estofan D, Senestrari D, Fiol de Cuneo M, et al. Effects of alcohol and cigarette consumption on human seminal quality. *Fertil Steril*. 2004;82(2):374-7.