Effect of Tobacco Chewing and Smoking on Male Infertility

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Research Article

Abstract: **Background and objective:** Infertility is one of the most tragic of all martial problems and even with most resent advances in the treatment the problem cannot be solved satisfactorily. It has been reported that male infertility accounts for about 40% of infertility in married couples. Hence we wanted to investigate the effect of various addictions like tobacco chewing and smoking on biochemical parameters of semen analysis. **Material and Methods:** The effect of tobacco chewing and smoking was evaluated in our biochemical laboratory on 75 subjects selected randomly from OBGY infertility clinic of MRMC Gulbarga, after institutional ethical clearance. The statistical analysis was done using student paired 't'- test using SPSS software. Results were expressed in terms of mean and standard deviation. p-value was taken significant at 5 percent confidence level ($p<0.05$). **Result:** Semen analysis was done in 3 groups I^{st} control, II^{nd} tobacco chewing and III^{rd} smokers. The value of biochemical parameter shows significant decrease from I^{st} to III^{rd} group. **Conclusion:** From our study we conclude that addiction has adverse effect on the biochemical parameter of semen analysis and thus affecting the male fertility.

Keywords: Semen analysis, Tobacco chewing, Smokers.

1. Introduction

Infertility is one of the most tragic of all marital problems. Despite of recent advances in the treatment of infertility; the problem could not be satisfactorily tackled so far for various reasons. Unfortunately some married couples are infertile and infertility is a social stigma. It has been reported that in about 40% of infertile couples, male are at fault while remaining 60% are due to female partners. It can be said that the investigations of these couples mainly fails because of ignorance and inadequate correlation of available information. Male fertility is studied by semen analysis, in which mainly the physical and biochemical parameters are studied. A verity of factors influences the composition of semen. It is seen that little attention is paid on the possible impact of smoking and tobacco chewing on reproductive capacity. It is reported that these addiction has caused considerable degree of fluctuation in volume motility, sperm count and biochemical parameters of semen. The important biochemical parameters are fructose and ascorbic acid concentration in semen. Thus the attempt is to see if there is any impact of addiction on physical and biochemical parameters of semen.

2. Materials and Methods

The present study was conducted in the department of Physiology at M.R Medical College Gulbarga. After obtaining approval from research and ethical committees of M.R. Medical College Gulbarga, the work was carried on 75 subjects, they were selected randomly, and whose wives were attending the department of Obstetrics and Gynecology, and were investigated in department of biochemistry MRMC. Written informed consent was obtained from all the participants prior to initiation of study. Subjects were divided into three groups First group consist of normal subjects, other two groups consists of tobacco chewers and smokers. Each group contains 25 subjects. Semen analysis was done to observe how the physical and biochemical parameters are affected in addiction group, and how these subjects suffer from infertility problems. The semen samples were analyzed for volume, motility and sperm count. The ascorbic acid and fructose levels were obtained calorimetrically.

3. Results

Table 1: Volume of semen in ml .Though there is slight decrease in volume, Statistical 'P' values are determined by applying 'T' test, which was not significant

Sr. no	Group	Volume	"P" value
I	Control	2.9	-
II	Tobcco chewers	2.48	N.S
III	Somkers	2.58	N.S

Table 2: Total motile sperm count. Motility is decreased in addicts and the 'P' value is highly significant

Sr. no	Group	Total motile sperm	"P" value
I	Control	158.2	-
II	Tobcco chewers	50.68	H.S
III	Somkers	47.84	H.S

Table 3: Total sperm count in millions / ejaculate. The count is decreased and 'P' values is highly significant in both the groups

Sr. no	Group	Total sperm count	"P" value
I	Control	180.46	-
II	Tobcco chewers	104.28	H.S
III	Somkers	79.2	H.S

Table 4: Ascorbic acid concentration in three groups. The ascorbic acid concentration goes on decreasing from group Ist to IIIrd group. It is highest in control group. It shows that as quality of semen goes on decreasing, ascorbic acid concentration also decreases. This indicates that as concentration of ascorbic acid decreases fertility also decreases. Statistical 'P' values was not significant.

Sr. no	Group	Ascorbic acid concentration	"P" value
I	Control	5.35	-
II	Tobcco chewers	4.71	N.S
III	Somkers	4.5	N.S

Table 5: Fructose concentration. It goes on increasing from Ist group to IIIrd group. It proves that as sperm density goes on decreasing fructose concentration increases. Thus there is inverse relation. Statistical 'P' values for fructose is significant.

Sr. no	Group	Fructose concentrtion	"P" value
I	Control	358.2	-
II	Tobcco chewers	401.08	S.S
III	Somkers	423.04	H.S

4. Discussion

I[st] group is called fertile group or control group. II[nd] group contained 25 subjects having history of Tobacco chewing since 10 -12 years. They use to take 2-3 packets of "Zarda" daily with each packet containing 10 gms of tobacco. III[rd] group contains 25 subjects having history of cigarette smoking more than 20 cigarettes per 24 hrs since 9 -10 years. Our study shows decrease in volume of semen from Ist group to IIIrd group. Though the decrease in the volume is very less, it indicates that addiction causes minimal changes in volume of semen. In some studies smokers were found to have semen volume significantly smaller than non smokers (2). Tobacco chewing also affects the motility. In the control group the total sperm cont is 180.46 million/ejaculate while it is decrease in addict group. The sperm count is greatly affected by smoking. The impact of tobacco on reproductive capacity was noted. Similar to our study decrease in sperm density in male smokers was reported (10). Also similar results were found in the study of Richar.D, Amelar and in others (7). We have followed three smokers for 5 -15 months after stopping smoking and it was found that stoppage of smoking has increased the sperm count by 50 -80 % suggesting that toxic chemicals in cigarette are responsible for the decrease reduction in the sperm count is reversible (5,6). Briggs has reported reduction of serum testosterone level in smokers as compared to non smokers, who were taking more than 30 cigarettes per day (3). Dr. Vine reported 13 to 17 % lower sperm count in smokers as compared to non smokers which was correlated to our study. But in the journal of Andrologia, it is found no determinant effect on spermatogenesis (2, 7). The ascorbic acid concentration goes on decreasing from group Ist to IIrd group i.e highest in control group than other two groups. This indicates that as the quality of semen goes on decreasing the ascorbic acid concentration also decreases thus decreases the fertility. Ascorbic acid concentration in the body depends upon dietary intake of fresh fruit, which are rich sources of ascorbic acid (12). The subjects belonging to addicts group have less dietary intake of fresh fruits which is also one of the reasons for lowering ascorbic acid concentration. Our study matches with the study conducted by Dr. Shirole .C.D. In contrast to the above finding some workers observe that fertile group shows lower ascorbic acid concentration than impaired semen (13). The significance of fructose in seminal plasma is a controversial subject. Some observe no statistical relationship between fructose level and sperm concentration, but others demonstrated definite inverse relationship between fructose and sperm count (4, 8). Our finding are not in conformity with those of Schecenfeld et.al , Moon and Bing who have reported the absence of any difference in fructose levels between normospermic, oligospermic and azoospermic (8,11).

5. Summary and Conclusion

- Tobacco chewing and smoking affect the volume and motility of sperm count in semen.
- The total sperm count and motile count is significantly decreased in tobacco chewers and smokers.
- The ascorbic acid concentration in semen of this studied group is lowered as compared to control groups but this decreased concentration is not significant.
- Fructose concentration is significantly increased in studied group as compared to control group. It shows that percentage of Fructose in the semen depends on sperm concentration and it is inversely proportional to the sperm concentration.
- Infertility is very tragic and major problem today, so an investigation of both male and female is essential.
- The present study indicates that addiction causes decrease in male fertility potential.
- However further studies are required in this field

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