ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 02 | February - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ASSOCIATION OF ALCOHOL CONSUMPTION, TOBACCO CHEWING AND SMOKING WITH FERTILITY AMONG THE MALE PATIENTS OF INFERTILITY COMING TO SIR T HOSPITAL, BHAVNAGAR

Pathology

Dr. Jay Raval* Resident Doctor, Department Of Pathology, Government Medical College, Bhavnagar *Corresponding Author

Dr. Pragnesh Shah Professor, Department of Pathology, Government medical college, Bhavnagar

Dr. Raina Goti Resident Doctor, Department Of Pathology, Government Medical College, Bhavnagar

ABSTRACT

Background: About 15% of couples who are trying to conceive are affected by infertility. Tobacco chewing, smoking and alcohol consumption have been implicated to affect reproductive health of men. These addiction habits are commonly seen in male patients of reproductive age groups. These are the avoidable factors which are contributing for male infertility. Semen analysis is the basic investigation for evaluation of male infertility. **Material And Method:** 168 cases which had come for semen analysis for evaluation of male infertility at central pathology lab were included in the study. After taking detailed history and written informed consent semen sample was received. Semen analysis was done and result of every semen parameter was noted. Fertility scoring was given according to WHO – 2010. This result was compared and analysed statistically. **Result:** On the basis of fertility scoring, 44 (26.2%) cases were infertile out of 168 cases. Out of these 44 cases, 40 (90.9%) cases had history of addiction of alcohol consumption, smoking or tobacco chewing, either single or in combination and 4 (9.1%) cases had no any addiction. The obtained result was statistically significant. **Conclusion:** This study shows that alcohol consumption, smoking or tobacco chewing consumption, either single habit or combination of more than one habit had negative effect on semen quality which in turn affect the fertility. So, awareness programme should be conducted about negative effects of these habit in reproductive age group population.

KEYWORDS

Infertility, Semen analysis, Addiction, Alcohol, Smoking, Semen parameters.

INTRODUCTION

Infertility is a disease of reproductive system which is defined by failure to achieve clinical pregnancy after 12 months or more of regular unprotected sexual intercourse. This definition is given by International Committee for Monitoring Assisted Reproductive Technology (ICMART) and World Health Organization (WHO). [1] One out of six couple is affected by infertility. There are various factors for infertility in infertile couple: Ovulatory factors, Utero-tubal peritoneal factors, Semen migration factors, Male factors. [2]

Approximately 15% of couples who are trying to conceive affected by infertility. [3] Male's inability to result in pregnancy in a fertile female is known as Male infertility, which is the cause in nearly 50% of infertile couples which occur as a result of abnormalities in sperm concentration, motility or morphology. The abnormalities in the semen parameters may occur singly or in combination which results in male infertility. Semen quality parameters are thus used as markers of male fertility. Men with semen parameters below the normal values described by the World Health Organization (WHO) are considered to have male-factor infertility. [4]

In majority male patient of infertility, there is no apparent reason for infertility could be found which drawn attention to the impact of lifestyle and environmental factors, especially obesity, smoking, alcohol intake, drug abuse, tobacco chewing and exposure to environmental toxins, on reproductive health of such male patients. [5] They show the harmful effects of these modifiable habits on sperm count, morphology, vitality and motility of sperm which result in infertility. The main motive behind identifying these factors and their impact on male fertility is that these are modifiable factors and can be controlled to improve and enhance the male reproductive potential.

Chronic consumption of alcohol affects hepato-biliary system. It also affects the male reproductive health which have negative impact on the male gonads. It can also lead to impairment in production of testosterone which decrease fertility and secondary sexual characteristics in males. [6,7] Chewing of tobacco products is another important modifiable lifestyle factor which is responsible infertility and for oral cancer also. Consumption of tobacco products for prolonged durations either in form of tobacco chewing or in the form of smoking leads to decrease the quality and quantity of sperm. [8] In India, tobacco is consumed in several forms, which include smoking in the form of Bidis, hookah, cigarettes and cigars.

Tobacco is also chewed extensively in India in the form of Paan masala, gutka etc. In Gujarat, it is more predominantly present in the region of Saurashtra. In these rural areas, there is low awareness of its health hazards and negative effects on fertility. [9]

MATERIAL AND METHODS

This study was conducted over one year period in Central Pathology Lab, Sir T Hospital, Bhavnagar under Department of Pathology, Government Medical College, Bhavnagar after taking permission from SRC & ethical committee.

Inclusion Criteria

All the patients coming to central pathology lab for semen analysis of age group between 20 to 50 years.

Exclusion Criteria

1. Patient on long term medications like anticancer drugs, testosterone, anabolic steroids, finasteride, dutasteride, ketoconazole, spironolactone, dapsone, lamotrigine etc. which can affect sperm quality.
2. Previous history of surgery involving male genitourinary tract.
3. Medical conditions affecting testicular function like trauma, varicocele, hydrocele, undescended testis, orchitis and mumps.
4. Patient who is on any other active fertility treatment.
5. Abstinence for <2 and >7 days.
6. Patient with age <20 years and >50 years.

Detailed clinical history and written informant consent of patient is taken while receiving the sample at central pathology lab. History of addiction was taken and patients were categorized into:

- **Alcohol consumption:** If person was drinking average ≤40 ml drink/day for minimum 1 year duration.
- **Smoking:** Average ≤1 cigarette or bidi/day for minimum 1 year duration.
- **Tobacco chewing:** Average ≤1 time per day for minimum 1 year duration.
- **No history:** Not fulfilling any of the above criteria of addiction.

Total 168 semen samples were examined. All samples were kept at normal room temperature and immediately processed after complete liquefaction. The semen usually liquefies within 15 to 30 min and semen analysis was done as per WHO 2010 guidelines. Physical examination of semen includes volume, appearance, liquefaction time, pH, viscosity and particulate matter. Microscopic examination includes sperm motility, sperm count, agglutination of spermatozoa, morphology of sperm and sperm vitality. Fertility scoring is done by individually scoring each semen parameters which are mentioned above, according to WHO 2010 [10] and cases were categorized on the basis of fertility status into fertile, sub-fertile and infertile categories.

OBSERVATION AND RESULTS

In our study, majority of cases 116 (69%) were in the age group of 20 – 30 years. Out of 168 cases, 124 (73.8%) were fertile and 34 (20.2%) were infertile as shown in Table – 1.

Table – 1: Distribution of cases according to fertility score

Sr. No.	Fertility status as per fertility score (Out of 20)	No. of cases	Percentage
1.	Fertile (Fertility score > 14)	124	73.8%
2.	Sub fertile (Fertility score 10 – 14)	10	6%
3.	Infertile (Fertility score < 10)	34	20.2%
Total	168	100%	

On the basis of history of addiction given by patient cases were distributed as shown in Table – 2 which distribute the patient in categories of no addiction, any one single addiction, combination of any two addiction and all three addictions.

Table – 2: Distribution of cases according to addiction

Sr. No.	Addiction	No. of cases	Percentage
1.	No addiction	42	25%
2.	Alcohol consumption	25	14.9%
3.	Tobacco smoking	30	17.9%
4.	Tobacco chewing	27	16.1%
5.	Alcohol consumption + Tobacco smoking	15	8.9%
6.	Alcohol consumption + Tobacco chewing	08	4.8%
7.	Tobacco smoking + Tobacco chewing	11	6.5%
8.	Alcohol consumption + Tobacco smoking + Tobacco chewing	10	5.9%
Total		168	100%

Table – 3 show distribution of fertility status of cases according to addiction. There were 42 (25%) cases with no any addiction, out of which 38 cases with normal fertility and there were 04 cases which had decreased fertility despite of no addiction. 126 (75%) cases had history of addiction. Of which 82 (48.9%) cases had only single addiction, 25 (14.9%) cases consumed only alcohol, 30 (17.9%) cases had addiction of only smoking and 27 (16.1%) cases had only addiction of tobacco chewing. There were 34 (20.2%) cases with combination of any two of addiction and 10 (5.9%) cases with combination of all three addictions, from which total 9 (5.2%) and 4 (2.4%) cases were infertile.

Table – 3: Distribution fertility of cases according to addiction

Sr. No.	Addiction	No. of cases			
		Fertile	Sub fertile	Infertile	Total
1.	No addiction	38 (22.6%)	02 (1.2%)	02 (1.2%)	42 (25%)
2.	Alcohol consumption	18 (10.7%)	02 (1.2%)	05 (3%)	25 (14.9%)
3.	Tobacco smoking	21 (12.5%)	02 (1.2%)	07 (4.2%)	30 (17.9%)
4.	Tobacco chewing	19 (11.3%)	01 (0.6%)	07 (4.2%)	27 (16%)
5.	Alcohol consumption + Tobacco smoking	10 (5.9%)	02 (1.2%)	03 (1.6%)	15 (8.8%)
6.	Alcohol consumption + Tobacco chewing	05 (3%)	01 (0.6%)	02 (1.2%)	08 (4.8%)
7.	Tobacco smoking + Tobacco chewing	07 (4.2%)	00 (0%)	04 (2.4%)	11 (6.6%)
8.	Alcohol consumption + Tobacco smoking + Tobacco chewing	06 (3.6%)	00 (0%)	04 (2.4%)	10 (6%)
Total		124 (73.8%)	10 (6%)	34 (20.2%)	168 (100%)

For statistical purposes, sub-fertile and infertile cases were combined in category of decreased fertility while applying chi square test. Further we apply chi-square test on each of above addiction category with "No addiction" category to see the result. On analyzing data by applying chi square test, p-value was found less than 0.05 with all the individual category, thus implying that association is seen between addiction and decreased fertility.

In our study, a majority cases 131 (78%) had Normozoospermia whereas 37 (22%) cases had Oligozoospermia. No cases had azoospermia. With respect to sperm motility, 94 (56%) cases were found to have normal sperm motility and remaining 74 (44%) cases were found to have Asthenozoospermia. On evaluation of semen volume, majority of cases 131 (78%) were found to have normospermia, while remaining 37 (22%) cases were found to have hypospermia. With respect to sperm morphology, 157 (93.4%) cases were found to have normal sperm morphology and 11 (6.6%) cases were found to have Teratozoospermia.

DISCUSSION

Various studies have been conducted worldwide to study the effects of alcohol consumption, smoking and tobacco chewing on fertility of males. The pathophysiology of male infertility could be explained by the cascades of molecular, biochemical and physiological events which are mostly represented by abnormal semen quality parameters.

In our study, target population was found to be in 20-30 years with 116 (69%) cases which is similar to a study conducted by Jajoo S et al [11] with 56% cases of <30 years. In another study by Aswal A et al [12] had maximum cases 64.8% in age group of 19 – 30 years. This is evident by the fact that in India target population for reproduction is between 20-30 years. Sperm concentration was normal (78%) in the present study and various other studies conducted by Aswal A et al [12], Khushbu et al [13] and Jajoo S et al [11]. Oligozoospermia and Azoospermia in present study is also in concordance with other studies. Motility was decreased in our study in 44% cases which is similar to other studies conducted by Aswal A et al, Khushbu et al and Jajoo S et al with 27.5%, 38.7% and 35% respectively. In our study, semen volume is normal in maximum cases i.e.,78% and reduced in 22%. Two other studies found similar result with decreased semen volume, Jajoo S et al and Raj et al [14] in which 22% and 20.2% results found respectively. Sperm morphology was altered in our study in 6.6% cases which is lower than other studied conducted by Khushbu et al and Kumar et al (15) having altered morphology in 34.4% and 29.6% respectively.

In present study, statistical significance was determined between life style factors like alcohol consumption, smoking and tobacco chewing with decreased fertility. Our results corroborated well with other studies as discussed above. Hence it is evident that alcohol consumption, smoking and tobacco chewing have a significant negative effect on the process of spermatogenesis, ultimately affecting sperm concentration, viability and motility. Hence clinician and fertility counselors need to be more focused to control infertility by modifying the life style factors

CONCLUSION

Alcohol consumption, smoking and tobacco chewing is most important health hazards which is seen in young male population of our country which affect negatively on male fertility by affecting semen quality. The result of our study shows that these addictions have some role in affecting semen quality which in turn affect fertility. In our study, there is significant reduction in semen parameters like sperm motility, sperm viability and sperm concentration in cases with history of any of above addiction, either single or in combination which result in decreased fertility.

Hence, awareness programmes should be conducted in the community especially for the target reproductive age group. The clinician should also explain the negative impact of these addictions to the couples visiting the infertility clinic for pre-conception counselling and the emphasize on improving fertility by lifestyle modification.

REFERENCES

1. Zegers-Hochschild, F., Adamson, G. D., De Mouzon, J., Ishihara, O., Mansour, R., Nygren, K., ... & Van der Poel, S. (2009). The international committee for monitoring assisted reproductive technology (ICMART) and the world health organization (WHO) revised glossary on ART terminology, 2009. Human reproduction, 24(11), 2683-2687.
2. Brugo-Olmedo, S., Chillik, C., & Kopelman, S. (2001). Definition and causes of infertility. Reproductive biomedicine online, 2(1), 173-185.
3. Agarwal, A., Mulgund, A., Hamada, A., & Chyatte, M. R. (2015). A unique view on male infertility around the globe. Reproductive biology and endocrinology, 13(1), 1-9.
4. Mathur, S., Jawad, K., & Dayal, S. (2019). Effect of smoking and alcohol consumption on reproductive hormones and semen parameters in male partners of infertile couples.
5. Gaur, D. S., Talekar, M. S., & Pathak, V. P. (2010). Alcohol intake and cigarette smoking: impact of two major lifestyle factors on male fertility. Indian journal of Pathology and Microbiology, 53(1), 35.
6. Künzle, R., Mueller, M. D., Hänggi, W., Birkhäuser, M. H., Drescher, H., & Bersinger, N. A. (2003). Semen quality of male smokers and nonsmokers in infertile couples. Fertility and sterility, 79(2), 287-291.
7. Goverde, H. J., Dekker, H. S., Janssen, H. J., Bastiaans, L. A., Rolland, R., & Zielhuis, G. A. (1995). Semen quality and frequency of smoking and alcohol consumption: an explorative study.
8. Bates, C., Fagerström, K., Jarvis, M. J., Kunze, M., McNeill, A., & Ramström, L. (2003).

European Union policy on smokeless tobacco: a statement in favour of evidence based regulation for public health. Tobacco Control, 12(4), 360-367.
9. Kahar, P., Misra, R., & Patel, T. G. (2016). Sociodemographic correlates of tobacco consumption in rural Gujarat, India. BioMed Research International, 2016.
10. World Health Organization. (2010). Who laboratory manual for the examination and processing of human semen.
11. Jajoo, S., & Kalyani, K. R. (2013). Prevalence of abnormal semen analysis in patients of infertility at a rural setup in Central India. International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 2(2), 161-165.
12. Aswal, A., Sharma, S., Bansal, R., & Khare, A. (2017). To analyse the semen for various parameters with special reference to lifestyle factors. International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 6(6), 2589-2593.
13. Vaghela, K., Oza, H., Mishra, V., Gautam, A., & Kumar, S. (2016). Effect of lifestyle factors on semen quality. Int J Life Sci Scienti Res, 2(5), 627-31.
14. Raj, A., Iqbal, B., Sharma, A., Gore, C. R., Kumar, H., & Singh, M. (2022). Effect of alcohol and smoking on semen analysis parameters. Medical Journal of Dr. DY Patil Vidyapeeth, 15(5), 696.
15. Kumar, S., Murarka, S., Mishra, V. V., & Gautam, A. K. (2014). Environmental & lifestyle factors in deterioration of male reproductive health. The Indian journal of medical research, 140(Suppl 1), S29.