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Study of Effect of Substance abuse on the Pulmonary Function Tests in Rural Community in Western Maharashtra

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ABSTRACT

Background: In India substance abuse is a common habit prevalent in both urban and rural areas. Cigarette and bidi smoking, tobacco chewing, has extensive effects on respiratory function and is clearly implicated in the etiology of a number of respiratory diseases. **Objectives:** 1) to study and compare the pulmonary function tests among smokers and non-smokers in a rural area. 2) To study the role of possible associated factors and relation to type, quantity and duration of common substances abused on the pulmonary function tests. **Setting**: Pravara Rural Hospital, Loni, District Ahmednagar, Maharashtra. **Study design**: Cross sectional study. **Materials & Methods**: The pulmonary function tests were assessed on computerized spirometer in 200 male subjects, having habit of substance abuse, in Loni village of Ahmednagar district in Western Maharashtra. **Statistical analysis**: SPSS Statistical Software version 16.0. **Results & Conclusion**: Almost all the pulmonary function parameters were significantly reduced in smokers as compared to other substances of abuse liability and obstructive pulmonary impairment was commonest. By spirometry a spectrum of pulmonary disorders may be detected at an early stage and subsequent morbidity can be minimized.

Key words: Substance abuse, Spirometry, Pulmonary functions, Rural area

INTRODUCTION

The epidemic of substance abuse in young generation has assumed alarming dimensions in India. Changing cultural values, increasing economic stress and dwindling supportive bonds are leading to initiation into substance abuse. According to the World Health Organization (WHO) substance abuse is persistent or sporadic drug use inconsistent with or unrelated to acceptable medical practice[1]. About 190 million people all over the world consume one drug or the other[2]. This Drug addiction causes immense human distress and the illegal production and distribution of drugs have spawned crime and violence worldwide.

Every year, June 26 is celebrated as International Day against Drug Abuse and Illicit Trafficking. It is an exercise undertaken by the world community to sensitize the people in general and the youth in particular, to the menace of drugs. Cannabis, heroin, and pharmaceutical drugs are the most frequently abused drugs in India[3]. In India smoking is a common habit prevalent in both urban and rural areas irrespective of mode of smoking i.e. cigarettes, bidis, pipes, cigar, hookah etc.

The Adolescent drug abuse is one of the major areas of concern in adolescent and young people's behavior. It is estimated that, in India, by the time most boys reach the ninth grade, about 50 percent of them have tried at least one of the substance of

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abuse nature[4]. In last three decades, many epidemiological surveys have been carried out in India to assess the prevalence of substance abuse. At the national and cross-national level, there has to be a concerted effort of all the countries in managing the issue of substance abuse, taking into account the local socio-cultural and political scenarios.

MATERIALS AND METHODS

The present cross sectional study was conducted in Pravara Rural Hospital of Rural Medical College, PIMS, Loni, in district Ahmednagar, Maharashtra. The study population included 200 male subjects having habit of substance abuse, of one type or the other, aged between 30-60 years. Individuals with history of smoking cigarettes / bidis daily for at least one year were considered as smokers. The materials used in the study were a computerized RMS Med-spirometer, weighing machine, measuring tape and Blood Pressure set. The spirometer records the amount of air and the rate of air that is breathed in and out over a specified time.

PROCEDURE OF SPIROMETRY

1. The subject is asked to sit comfortably in a chair.
2. The complete procedure is explained, all doubts if any are cleared.
3. Subject is instructed to breathe in fully by deep inspiration with nostrils closed by putting a soft nose clip.
4. Seal the lips around the sterile mouthpiece of spirometer and forcefully expire the air out.
5. Repeat the test until three acceptable and reproducible results are obtained.

The highest FEV_1 and FVC values are recorded, out of the three spirograms. The observations of the study were analyzed by statistical methods like percentages, chi square test and t-test of significance.

OBSERVATIONS

In the present study it was observed that there was no significant difference in the mean physical parameters like age, height, weight, body mass index and body surface area by calculating mean and standard deviation in different substance abusers (Table 1).

Most of the smokers smoked only bidi (52.0%) followed by only cigarettes (9.0%). Tobacco chewers (Gutkha, Panmasala, Khaini, Pan, Mishri etc.) were 24.0%, 12.0% were alcoholics and only 3.0% were involved in hard drug abuse (Canabis, i.v.drug use, opium, ganja, brown sugar etc.) (Table 2).

All Pulmonary function parameters like FVC, FEV1, FEV_1/FVC, PEFR, $FEF_{25-75\%}$ and MVV showed statistically highly significant association between smokers and non-smokers by applying unpaired t-test of significance ($p < 0.001$). The obstructive lung changes were most common and were observed predominantly in smokers (26.27%) as compared to other substance abusers (Table 3).

DISCUSSION

In the present study it was observed that there was no significant difference in the mean physical parameters like age, height, weight, body mass index and body surface area of substance abusers. None of individuals smoked tobacco in any form other than bidis or cigarettes. Most smokers were bidi smokers. In India, tobacco is consumed mainly in the form of bidis, followed by smokeless tobacco and cigarettes. Bidi smoke may be more injurious because bidi contains unrefined form of tobacco as compared to cigarettes. Cigarette smoking has extensive effects on respiratory function and is clearly implicated in the etiology of a number of respiratory diseases, particularly chronic bronchitis, emphysema, and bronchial carcinoma. All Pulmonary function parameters showed statistically highly significant association between smokers and non-smokers by applying unpaired t-test of significance ($p < 0.001$).

In Uttar Pradesh, Dube and Handa [5] reported that 22.8 per 1000 were dependent on alcohol and drugs while Thacore [6] from Lucknow gave a figure of 18.55 per 1000. Various epidemiological surveys also revealed that 20-40% of subjects above 15 years are current users of alcohol and 10% of them are regular or excessive users[7, 8]. In a rural population of Uttar Pradesh alcohol was found to be the commonest substance abused (82.5%) followed by cannabis (16.1%).[5-6]

Varma et al [9] found that rates of current use of alcohol in Punjab were 45.9% in Jalandhar and 27.7% in Chandigarh whereas it was 28.1% in rural areas of Punjab[10]. Shukla BR [11] reported that 38.3% of the rural population in Uttar Pradesh was habitual substance users. In a study conducted in rural community in Bihar prevalence of alcohol/drug use was found to be 28.8% of the study population[12].

CONCLUSION

The pulmonary function tests were assessed by using a computerized Spirometer in 200 male substance abusers. The present study reveals the effect of type, duration and pattern of substance abuse in rural community of India. Bidi smoking was most common as the study setting was in rural India. Almost all the pulmonary function parameters were significantly reduced in smokers as compared to non smoker substance abusers and obstructive pulmonary impairment was

Table 1: Physical Characteristics of Substance Abusers

Variables	Smoking Mean ± 2 S.D.	Tobacco chewing Mean ± 2 S.D.	Alcohol Mean ± 2 S.D.	Others (Cannabis, charas, bhang, or ganja) Mean ± 2 S.D.
Age (years)	48.26± 10.09	48.10 ± 10.54	45.15 ± 12.14	46.18 ± 13.57
Height (m)	1.66 ±0.11	1.67 ± 0.12	1.62 ± 0.32	1.61 ± 0.62
Weight (Kg)	65.4 ± 8.8	64.4 ± 11.5	61.4 ± 13.7	60.4 ± 2.5
Body Mass Index	23.52 ± 3.20	23.80 ± 3.37	22.51 ± 2.68	24.86 ± 2.30
Body surface area	1.71 ± 0.06	1.74 ± 0.14	1.54 ± 0.23	1.68 ± 0.48

Table 2: Distribution of types of Substances Abused

Type of substances abused	No.	%
Bidi smoking	104	52.0
Cigarette smoking	18	9.0
Tobacco chewing (Gutkha/Pan masala/ Pan/ Khaini/Mishri)	48	24.0
Alcohol	24	12.0
Others (Cannabis products, charas, bhang, or ganja, etc.)	6	3.0
Total	200	100.0

Table 3: Interpretation of PFT results in Substance Abusers

PFT Results	Smokers No. (%)	Tobacco chewers No. (%)	Alcoholics No. (%)	Others No. (%)
Obstructive	32 (26.27)	11 (22.91)	2 (8.33)	1 (16.66)
Restrictive	8 (6.58)	4 (8.33)	2 (8.33)	1 (16.66)
Mixed	18 (14.76)	2 (4.16)	1 (4.16)	0 (0.0)
Normal	64 (52.45)	31 (64.58)	19 (79.16)	4 (66.66)
Total	122 (100.0)	48 (100.0)	24 (100.0)	6 (100.0)

Chi square value = 20.84, $p < 0.001$, highly significant.

commonest in all the substance abusers. Efforts should be made to educate the community about the harmful effects of substance abuse.

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