



EFFECT OF ORAL TOBACCO ON VITAL DATA

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ABSTRACT Chewing Tobacco is a global public Health hazard.oral and nasal smokeless products have been used in many countries for centuries. Smokeless tobacco use has been associated with oral cancer and leukoplakia at the site of application of tobacco .Nicotine is cardio active, changes in heart rate, temperature respiratory rate blood pressure were observed. At present cross-sectional study was done between September 2020 to February 2021 on apparently healthy individuals of age group 20 to 40 years who have the habit of tobacco chewing for more than 2 years. Oral use of smokeless tobacco is widely prevalent in India. On chewing tobacco in any form, nicotine is released into bloodstream which in turn has effect on sympathetic nervous system Hence the present study was conducted to study the effect of oral tobacco on heart rate ,respiratory rate ,blood pressure and temperature

KEYWORDS : oral tobacco, blood pressure, temperature, Respiratory rate, Heart Rate.

INTRODUCTION

Chewing Tobacco is a global public Health hazard Nicotine is cardio active. Changes in heart rate and blood pressure were observed with use of smokeless tobacco. The number of potentially noxious chemicals in tobacco products is vast Oral use of smokeless tobacco is widely prevalent in India,different forms include chewing, sucking and applying tobacco preparations to the teeth and gums. Nicotine is absorbed rapidly from the lining of the mouth ,it moves quickly to the brain, where it acts on nicotinic cholinergic receptors to produce its gratifying effects, which occur within 10 to 15 seconds after chewing. About 35–40% of tobacco consumption in India is in smokeless forms, mostly of the species *Nicotiana rustica*, while most smoking tobacco is *N. tabacum*. Many of the risks to health and life caused by tobacco consumption develop over a long period, and take decades to become fully evident. Components of oral tobacco products particularly polycyclic hydrocarbons, and nitrosamines are potent carcinogens.

The major health consequences associated with smokeless tobacco use in India include cancers at several sites ,and poor reproductive outcomes. There are some research results on the impact of smokeless tobacco on blood pressure and cardiac disease. On chewing tobacco, nicotine has an effect on the sympathetic nervous system like vasoconstriction . Since, hopefully the same amount of blood is still going through the body, this results in a net increase in the pressure within the system. Nicotine has dramatic effect on circulatory system ,increasing the heart rate ,constricting the small blood vessels ,lowering skin temperature.

Aim: To study the effect of Chewing tobacco.

Objective: To observe the changes in Heart rate, temperature, Respiratory rate, Blood Pressure after chewing tobacco.

There is sufficient information available regarding changes in vital data in long term tobacco users. But there is paucity of information about immediate changes in vital data in short term tobacco intakers. Therefore in the present study changes in HR, Temp, RR, and BP immediately after chewing tobacco were observed

Review Of Literature

In 1753 Linnaeus christened found the genus of tobacco plant “Nicotine tobacco”. In 1928 Posset and Raimann were the first to isolate the important ingredient of tobacco the “Nicotine”.In 17th Century tobacco was introduced in India by portuguese. Smokeless tobacco is used orally in two ways: preparations are either placed in various parts of the mouth and sucked or they are chewed Tobacco, areca nut and slaked lime preparations are chewed in parts of North India where they are known by different names: *Mawa*, *Dohra*, *Gutkha* , *Mishri* With ageing there was an increase in the frequency of current use of smokeless tobacco

Table 1 Frequency of Current Use of Smokeless Tobacco by Age

Age	Six Times In Percent
15-19	0%
20-24	10%
25-29	35%
30-34	32.4%
35-39	28.3%
40-44	35.7%
45-49	27.9%
50-54	34.5%
55-59	22%
60-64	26%
65-69	38%

Toxicity of Oral Tobacco Products

About 35–40% of tobacco consumption in India is in smokeless forms, mostly of the species *Nicotiana rustica*, while most smoking tobacco is *N. tabacum*. Samples of *N. rustica* have been found to contain higher concentrations of tobacco-specific nitrosamines than *N. tabacum*. Among important toxic compounds identified, other than nicotine, are carcinogenic nitrosamines, derived from nitrites, amines, proteins and alkaloids present in the leaf, polycyclic aromatic hydrocarbons resulting from the curing process, radioactive elements absorbed from the soil and the air, and cadmium in tobacco grown on cadmium-rich soils.

Implications

Mortality : Smokeless tobacco use in india may be considered as a potent contributor to mortality.

Morbidity: The major health consequences associated with smokeless tobacco use include cancers at several sites There are some research results on the impact of smokeless tobacco on blood pressure and cardiac disease, also can predispose to diabetes mellitus and aggravate asthma. .Non communicable diseases.

Oral cancers: Oral and pharyngeal cancers have a high incidence in India.

Oropharyngeal cancers: A significant relative risk of 1.74 was found for oropharyngeal cancer in men who chewed betel quid with tobacco, after adjusting for smoking and alcohol consumption, in one study.

Oral submucous fibrosis Hypertension

A study from India revealed that the habit of using khaini increased the risk of hypertension.

Another study found statistically significant increase in heart rate and Blood pressure following the chewing of betel quid with tobacco for 15– 30min.High-density lipoprotein-cholesterol was lower in both smokers ($P < 0.01$) and tobacco chewers ($P < 0.001$) than in the controls; it also found that both smokers and tobacco chewers had higher values for total cholesterol, low-density lipoprotein cholesterol,

very low-density lipoprotein-cholesterol and triglycerides, as compared to the no habit group

Adverse effects on pregnancy

Studies from India have shown a nearly threefold increase in stillbirths and a 100–400 g decrease in birth weight, in offspring of women who applied or chewed tobacco during pregnancy.

Dental Hygiene

Bivariate analysis revealed that the overall periodontitis levels were significantly higher in betel chewers and smokers than in nontobacco users.

About 4000 chemical compounds are identified from the Gutkas, Khaini, etc. . . . Mainly it has the following compounds.

1. Nicotine 2. Carbon dioxide 3. Nitrosamines 4. Hydrogen Cyanate 5. Pre-carcinogens like hydrocarbons, radioactive compounds. 6. Toxic metals like arsenic & Nickel.

The immediate effects of nicotine on the body include:(5)

- Increase in blood pressure
- Increase in heart rate
- Thickening of blood
- Narrowing of arteries
- Decrease in skin temperature
- Increase in respiration
- Vomiting, and
- Diarrhea

Long term effects of nicotine on the body include(5)

- Blockage of blood vessels, thus a slower heartbeat than non-smoker's at rest
- Depletion of vitamin C
- Reduction in the effectiveness of the immune system – making it harder to fight off dangerous infections
- Cancer of the mouth; throat; and lungs
- Cancer of the upper respiratory tract
- Hurting physical fitness in terms of performance and endurance
- Bronchitis and/or emphysema
- Stomach ulcers
- Weight loss
- Dryness and wrinkling of skin, often times giving the skin a leathery appearance
- Production of abnormal sperm, causing birth defects

Tobacco stimulates the autonomic ganglia and peripheral sensory receptors mainly in the heart. Stimulation of these receptors elicits various autonomic nervous reflex responses mainly tachycardia, increased cardiac output and increased arterial Blood pressure. The short term administration of oral tobacco will usually results in an increase of about 5-10mmHg of Blood pressure and 15-25 bpm increase in HR.

Nicotine is Quickly absorbed into the blood stream through the lining of the mouth primarily across mucous membrane. And becomes maximal at 5 minutes, enters the brain quickly usually within 8 seconds after chewing . there after nicotine is distributed to the body tissues Nicotine is rapidly and extremely metabolized.

Materials And Methods.

The subjects for this study included Apparently healthy individuals who have the habit of tobacco chewing for more than 2years.

Inclusion Criteria:

Men and women of 20-40 years who take tobacco for a minimum period of 1 year. Chewing tobacco in a dose of average 200mg pack of gutka and chewed for 30 minutes. Saliva which contains tobacco juice was spit out.

Exclusion Criteria :

- All patients with cardiac disorders Thyroid disorders
- Hypertension, Renal diseases Chronic respiratory diseases
- Pregnancy are excluded from the study

Type of study:

Cross sectional study

Statistical analysis:

The study is done using MS excel

Statistical tests applied:

Statistical application was by descriptive statistics, and paired t- test . A cross sectional survey was done between between September 2020 to February 2021 and data collected.

Data collection:

Data was collected from habitual tobacco chewers from general public.

Ethical Considerations:

Approval was obtained from the ethical committee of Siddhartha Medical College, Vijayawada.

Experimental protocol:

All the subjects were thoroughly examined and found physically & mentally fit. Verbal consent was taken from subject. Height and weight of the subjects are recorded subject was asked to take rest for 5 minutes pulse rate is recorded Respiratory rate is counted. Oral body temperature is recorded using Mercury Thermometer. The Blood pressure is recorded using sphygmomanometer in the right upper limb in supine posture. After taking one pack of Oral Tobacco of about 200mg again the heart rate, respiratory rate, Temperature and Blood Pressure recorded after 30 minutes. All the results of the study group tabulated and graphically represented.

ANALYSIS OF RESULTS

The heart rate, temperature, respiratory rate and Blood Pressure of 100 tobacco chewers were recorded and studied. The findings were analyzed as mentioned below.

Heart rate:

The heart rate of the subject was recorded before and after chewing tobacco The results were shown in table No. 2

The Heart rate showed statistically significant increase after chewing tobacco $P < 0.001$.

Table No:2

Variable	Mean [Before]	Mean [After]	P-Value	Inference
Heart rate	74.14	78.6	$P < 0.001$	Significant

Temperature:

Temperature of the subject was recorded before and after chewing. The results are shown in table No.3

The temperature showed a statistically significant increase after chewing a pack of oral tobacco in the form of Gutka . $P < 0.001$ Table No:3

VARIABLE	MEAN [BEFORE]	MEAN [AFTER]	P-VALUE	INFERENCE
Temperature	98.29	97.92	$P < 0.001$	Significant

Respiratory rate:

Respiratory rate was counted for the subjects before & after chewing tobacco

The results are tabulated in table No:4

Respiratory was significantly increased, $P < 0.001$ after chewing tobacco.

Table No:4

variable	Mean [before]	Mean [after]	p-value	Inference
Respiratory Rate	13.1	15.86	$P < 0.001$	Significant

Blood Pressure:

Both systolic Blood Pressure and Diastolic Blood Pressures were recorded before and after chewing tobacco SBP is shown in table No. 5 SBP is shown in Systolic B.P shows a significant increase

Table No: 5

Variable	Mean [before]	Mean [After]	P-Value	Inference
Systolic Blood Pressure	117.87	125.5	$P < 0.001$	Significant

Diastolic Blood Pressure:

DBP is shown in TableNo6

Diastolic B.P shows a significant increase of $P < 0.001$

Table No: 6

Variable	Mean [before]	Mean [after]	p-value	inference
Diastolic Blood Pressure	78.44	83.87	P<0.001	Significant

DISCUSSION

In the present study the heart rates were significantly elevated in smoke less tobacco users 74.14 beats per minute before chewing tobacco and 78.6 beats per minute after chewing tobacco.

In the present study the blood pressure in smokeless tobacco users increased from mean systolic B.P of 117.87 mm Hg. before chewing to 125.5 mm Hg. after chewing. Diastolic BP increased from 78.44 mm Hg. to 83.87 mm Hg. After chewing indicating that Nicotine influence on vascular tone. SBP was significantly elevated on an average of 8 mm Hg.

DBP was significantly elevated on an average of 5 mm Hg. In the present study the temperatures decreased after chewing tobacco. Previous investigators have found a consistent effect of tobacco on heart rate and temperature and respiratory rate.

Immediate effect of tobacco in the form of chewing was evaluated in 40 healthy male by name PK.Sharma. Healthy males who were given Pan containing 200mg. of tobacco to chew. Allen and Hatsukami studied the immediate effects of chewing tobacco. The present study confirms their findings.

The present study was consistent with WOLK et al. who previously reported that heart rate, peripheral blood pressure and respiratory rate were elevated after Smoke less Tobacco use.

Nicotine-mediated increases in adrenal medulla catecholamine secretion as well as adrenergic-mediated vasoconstriction in the periphery likely contribute to heart rate and pressor response. The stimulant effect of nicotine on respiratory centre causes increase in respiratory rate. Nicotine decreases cutaneous blood flow which explains the decrease in body temperature. In Dr horsley study also a significant decrease in body temperature was observed.

CONCLUSION

In this study of Immediate effect of chewing tobacco in the form of a pack containing 200 mg of tobacco evaluated in 100 healthy individuals. Heart rate, temperature, respiratory rate, blood pressure measured twice for each subject once before chewing and again immediately after completion of chewing. The data showed statistically significant increase in heart rate, blood pressure as well as respiratory rate and significant decrease in temperature. The changes in cardiovascular and respiratory parameters following tobacco chewing in the study group was significant. Chewing tobacco is hazardous to health. Hence there is a dire need to raise awareness and Hazards smokeless tobacco in the society.

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