

Effect of Chewing Tobacco on Fasting Blood Sugar Level in Bikaner City Population

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ABSTRACT

Background: The addictive nature of tobacco compounds the problem, as quitting becomes difficult even for concerned users. The aim of this study was to determine the effect of chewing tobacco on fasting blood sugar level.

Material & Methods: The present study has been conducted on the population of Bikaner city (Rajasthan) aged between eighteen years to fifty five years in the Department of Physiology, S.P. Medical College, Bikaner. In the study the data was compared between study and control groups. Each group is divided into two sub groups on the basis of age: group I = 18-35 years of age and group II = 36-55 years of age. Blood samples from all the subjects were collected in the morning after an overnight fasting for the analysis of fasting blood sugar.

Results: In this study the mean value of BMI in chewing tobacco non-users was 22.77 ± 0.5054 & 22.45 ± 0.8629 in group I & group II respectively. The mean value of BMI in chewing tobacco users was 22.66 ± 0.5887 & 22.35 ± 0.5986 in group I & group II respectively, But the difference of mean value of BMI is statistically non-significant in both group I ($p=0.4946$ NS) & group II ($p=0.6470$). The present study showed the mean value of FBS in group I in chewing tobacco non-users & users 83.72 ± 2.07 & 92.24 ± 3.419 respectively. The difference of mean value of FBS was statistically highly significant ($p < 0.0001^{***}$) in group I. The mean value of FBS in

group II in chewing tobacco non-users & users 83.72 ± 2.49 & 94.92 ± 3.161 respectively. The difference of mean value of FBS was statistically highly significant ($p < 0.0001^{***}$) in group II.

Conclusion: The present study shows increase in blood sugar level in people consuming chewing tobacco. Awareness campaign among youths regarding the deleterious effect of tobacco may lower the trend of using chewing tobacco products.

Key Words: Smokeless Tobacco, BMI, FBS, Tobacco Chewers.


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INTRODUCTION

Smokeless tobacco (SLT) refers to tobacco that is consumed without heating or burning at the time of consumption. It can be used orally or nasally. The use of SLT is widespread in India and in western countries as well. In India, according to recent epidemiological studies, SLT users contribute about 40% of the total tobacco used (rest being constituted by smoking forms including beedi and cigarettes).¹

The use of pan masala / gutkha is considered a benign and socially acceptable habit by most Indians. There is even an element of prestige associated with the habit. The addictive nature of tobacco compounds the problem, as quitting becomes difficult even for concerned users. This "socially accepted addiction" is, in fact, proving more dangerous than other addictions.² According to WHO estimates, there are nearly 2.5 crore tobacco users in India, including both smoked and chewed forms. In India, tobacco

consumption is responsible for half of all cancers in men and a quarter of all cancers in women.

The National Family Health Survey conducted in 1998-1999, reported a prevalence rate of 28.3% for chewing tobacco and 29.4% for smoking tobacco in men aged 15 years and above.

Population attributable risk percentage was observed to be 66.1 for tobacco chewers for the development of oral cavity cancer³, a possible effect on blood sugar levels, possibly increasing the risk of type 2 diabetes.⁴ The habit of chewing pan masala not only poses a serious health hazard for the individual, but it poses a problem to society at large.⁵ The nicotine contained in tobacco smoke produces an elevation of the plasmatic catecholamines which, in turn, may be the cause of the increase in basal glycemia by several mechanisms. The aim of this study was to determine the effect of chewing tobacco on fasting blood sugar level.

MATERIAL & METHODS

The present study was a cross sectional study conducted on the population of Bikaner city (Rajasthan) aged between eighteen years to fifty five years in the Department of Physiology, S.P. Medical College, Bikaner on hundred subjects i.e. fifty chewing tobacco users (study group) and another fifty chewing tobacco non users who should not be active or passive smokers (control group).

Selection Criteria for Study Group

1. Age should be between eighteen to fifty five years.
2. Exclusive smokeless tobacco users for at least last five years.
3. Body mass index should be within normal range.
4. The subject was selected randomly in Bikaner City.

Selection Criteria for Control Group

1. Same age group as study group.
2. Same Socioeconomic Status.
3. Subjects who had never taken any type of tobacco in any form.
4. Body mass index should be within normal range.

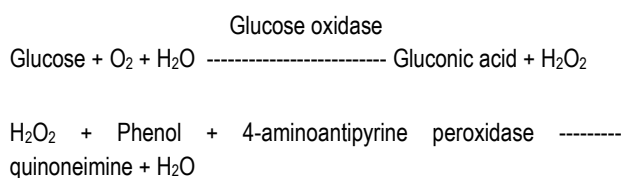
Exclusion Criteria

1. Smokers (Active as well as Passive).
2. Presence of any self-reported acute illness, lung diseases, heart diseases, malignancy, chronic liver or kidney failure, diabetes mellitus, obesity, history of heavy alcohol consumption will be excluded from the study.

In the study the data was compared between study and control groups. Each group is divided into two sub groups on the basis of age: group I= 18-35 years of age and group II= 36-55 years of age.

Sample Collection: Blood samples from all the subjects were collected in the morning after an overnight fasting for the analysis of fasting blood sugar in central laboratory of S.P. Medical College, Bikaner.

Fasting blood sugar (FBS): The quantitative estimation of the fasting blood sugar was done by glucose oxidase method, using enzymatic kits (GOD-POD) provided by Diabetes Care and Research Centre.



The red colored complex quinoneimine formed was measured colorimetrically and the intensity of the color formed was directly proportional to the concentration of the glucose in the sample. For statistical study of data, appropriate statistical model were applied for statistics. From the control group data, same tables were formed as in study group. From all these data, mean values were used with ± standard error. Finally the results obtained were compared with the reference data in the discussion part.

RESULTS

The present study was conducted on the population of Bikaner city (Rajasthan) aged between eighteen years to fifty five years on hundred male subjects i.e. fifty chewing tobacco users (study group) and fifty chewing tobacco non users who should not be active or passive smokers (control group).

In this study the chewing tobacco non-users & users was twenty five subjects each in group I (18-35 yrs) and group II (36-55yrs). (Table 1)

In this study showed the mean value of BMI in chewing tobacco non-users was 22.77±0.5054 & 22.45±0.8629 in group I & group II respectively. In chewing tobacco users was 22.66±0.5887 & 22.35±0.5986 in group I & group II respectively, But the difference of mean value of BMI is statistically non-significant in both group I (p=0.4946 NS) & group II (p=0.6470). (Table 2)

The present study showed the mean value of FBS in group I in chewing tobacco non-users & users 83.72±2.07 & 92.24±3.419 respectively. The difference of mean value of FBS was statistically highly significant (p<0.0001***) in group I. The mean value of FBS in group II in chewing tobacco non-users & users 83.72±2.49 & 94.92±3.161 respectively. The difference of mean value of FBS was statistically highly significant (p<0.0001***) in group II. (Table 3 & 4)

Table 1: Age based distribution of subjects (Chewing tobacco non-users and users)

Age group	Number of Chewing tobacco non-users	Number of Chewing tobacco users
Group I (18-35 years)	25	25
Group II (36-55 years)	25	25
Total	50	50

Table 2: Shows the BMI (mean ± SD) in Chewing tobacco non-users and users

Age group	Chewing tobacco nonusers BMI(kg/m ²)	Chewing tobacco users BMI(kg/m ²)	p-value
Group I (18-35 years)	22.77 ± 0.5054	22.66 ± 0.5887	0.4946 NS
Group II (36-55 years)	22.45 ± 0.8629	22.35 ± 0.5986	0.6470 NS

Table 3: Shows the FBS (mean ± SD) in Chewing tobacco non-users and users in Group I

	Chewing tobacco non-users (Mean±S.D)	Chewing tobacco users (Mean±S.D)	t value	p Value
FBS (mg/dl)	83.72±2.072	92.24±3.419	10.66	<0.0001***

Table 4: Shows the FBS (mean ± SD) in Chewing tobacco non-users and users in Group II

	Chewing tobacco non-users (Mean±S.D)	Chewing tobacco users (Mean±S.D)	t value	p value
FBS (mg/dl)	83.72±2.492	94.92±3.161	13.91	<0.0001***

DISCUSSION

The subjects included in this study was residents of Bikaner City (Rajasthan). All included subjects were selected randomly. There was no significant difference in the anthropometric parameters including age, height, weight and BMI. There was no considerable difference between economic status of control and study group of individuals. Education standard has been found worse among chewing tobacco users in comparison with chewing tobacco non-users counterpart. Expenditure on tobacco has been found significantly higher in proportion of their daily income in India.⁷ Rooban et al⁸ observed that 34% of the study population (15 years or older) used chewable smokeless tobacco. Smokeless tobacco consumption was significantly higher in poor, less educated populations.

The present study shows the difference of mean value of BMI is statistically non-significant in between group I (p=0.4946 NS) and Group II (p=0.6470 NS). Similar findings were suggested by Rooban et al⁸, Purushottam Pramanik et al⁹, and Dr. Rajesh Shrivastava et al.¹⁰

The present study shows that chewing tobacco users have significantly higher level of Fasting blood sugar than in control group (p value <0.0001***, <0.0001*** in group I & II respectively). Significant increase of blood glucose level in gutkha consumers have also been noted by Roan Mukherjee et al.¹¹ It has been proposed that nicotine present in tobacco may hamper the maintenance of blood glucose level by insulin. Nicotine possibly lowers insulin sensitivity.¹² Moreover, adiponectin (a hormone secreted by adipocytes) gets lowered due to nicotine component of tobacco.¹³ Adiponectin is involved in the maintenance of blood glucose levels.¹⁴ Lowering of adiponectin had been linked to the possibility of developing type 2 diabetes.¹⁵ Rise in mean values of glucose levels in gutkha consumers have also been noted by P. Jaganmohan et al.¹⁶

CONCLUSION

The present study also shows increase in blood sugar level in people consuming chewing tobacco. Awareness campaign among youths regarding the deleterious effect of tobacco may lower the trend of using chewing tobacco products.

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