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Association Of Smokeless Tobacco Habit with Diabetes Mellitus and Hypertension

Research Article

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Abstract

Smokeless tobacco is a tobacco which is consumed without burning, either orally or nasally. It is also called chewing tobacco, oral tobacco, dip, chew or snuff. Smokeless tobacco used in various forms is very common among Indian population. There's been a major increase in the diabetic and hypertensive patients worldwide. The risk factors associated are many. This study is done to evaluate the association of smokeless tobacco with diabetes mellitus and hypertension. The study was conducted in a Private Dental College in a University-based hospital set up. The study size of 31 patients was considered in the study. These patients consumed smokeless tobacco and had diabetes and/or hypertension. Information regarding gender and the presence of the systemic illness was collected from the case sheets of the patients. Chi square test was performed for statistical analysis. Diabetes mellitus and hypertension, as individual systemic illness is most commonly present in patients in the age group of 41-50 years. Males with smokeless tobacco consumption were more than females. Diabetes mellitus was present predominantly in patients who chew paan (36.37%), hans (10%) and gutkha (16.67%). Presence of hypertension was significantly lesser in patients consuming paan (16.67%), hans (6.67%) and gutkha (3.33%). The p value of pan chewing is 0.86, hans is 0.67 and gutkha is 0.40, p value (<0.05), which is statistically not significant. Within the limits of the study, it was found that diabetes and hypertension is present predominantly in 41-50 years of age. Paan chewing was the most common habit studied in males and females. Diabetes mellitus was most commonly present in patients chewing paan, hans, gutkha followed by hypertension.

Keywords: Diabetes; Gutkha; Hypertension; Paan; Smokeless.

Introduction

Smokeless tobacco use in India raises various concerns. It is commonly used and increasingly so, especially as new forms of smokeless tobacco have been emerging over the last few decades [1]. Increasing use has been reported not only among men but also in children, teenagers, women of reproductive age.

Smokeless tobacco is consumed in various forms. Air-dried tobacco that is used along with lime, with Areca nut in a betel quid is paan. Gutka, a dry preparation, containing Areca nut, soaked lime, catechu, condiments and powdered tobacco is available in several brands [2].

Type II diabetes mellitus and hypertension is a major problem, the prevalence of which is increasing rapidly in many countries. In addition to the influence of genes, lifestyle factors that decrease insulin sensitivity or insulin secretion are of etiological importance in the development of diabetes mellitus. One such factor is smoking and smokeless tobacco consumption, that is shown to increase the risk of type II diabetes [3].

Hypertension is a common and serious cardiovascular disease affecting Indian population greatly. Genetic and environmental causes are considered as logical factors for primary hypertension [4]. Smokeless tobacco contains various ingredients that are known to raise blood pressure, like nicotine, sodium and licorice. Nicotine, a volatile alkaloid, is one of the most addictive and stimulant drugs [5]. Because of these ingredients, smokeless tobacco may present an unrecognized environmental cause of hyperten-

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sion [6]. There is some evidence that nicotine contributes to circulatory disease [7].

Association of smokeless tobacco consumption with occurrence of other adverse cardiovascular events like myocardial infarction, stroke and ischemic heart disease has been studied in detail in western population [8, 9].

Previously, our team had conducted various clinical trials [5, 10-23] over the past 5 years. Now we are focussing on epidemiological surveys. The idea for this survey stemmed from the current interest in our community.

This study is done to evaluate the association of smokeless tobacco consumption with diabetes mellitus and hypertension.

Materials and Methods

The study was done in a University-based hospital setting in Saveetha dental College and Hospitals. The study was a unicentric study. The population selection was done randomly. The population type selected was smokeless tobacco patients with diabetes, hypertension or both. Ethical approval was obtained from the Institutional Ethical Committee. Case records of 86000 patients who had visited Saveetha Dental College and Hospitals between June 2019 to April 2020 were analysed. Out of which, 31 patients who had habits of chewing smokeless tobacco and presented with a history of diabetes, hypertension or both were included in the study.

Data Collection

Data were collected based on age, gender, type of smokeless tobacco, history of diabetes or hypertension or both.To minimise sampling bias, simple random sampling was done. Excel tabulation of data collected was done. Incomplete or censored data were excluded.

Statistical Analysis

The collected data was important to SPSS version 23. Descriptive statistics was done. Chi-square test was used to determine the association of smokeless tobacco with diabetes mellitus and hypertension.The independent variables in the study are age, gender and type of smokeless tobacco. The dependent variables in the study are patients who had habits of smokeless tobacco, and history of diabetes or hypertension or both.

Results and Discussion

In the present study, 60% of the study population had diabetes, 26.26% had hypertension and 13.33% had both diabetes and hypertension (Figure1). 86.7% of the patients were males and 13.3% were females (Figure 2). Paan chewing habit was equally present among males (53.3%) and females (10%) while gutkha chewing was at least common (Figure 3). It was found that diabetes mellitus and hypertension was more prevalent in the age group of 41 to 50 years in which 30% of the patients were diabetic and 10% were hypertensive. Both diabetes and hypertension (10%) were most commonly present in the age group of 51 to 60 years (Figure 4). Among the males, 53.3% of them were diabetic and 23.2% were hypertensive. Among the females, 6% of them were diabetic and 3.33% were hypertensive (Figure 5). In our study, it was found that 36.37% of paan chewers were diabetic, 16.67% had hypertension and 10% had both diabetes and hypertension (Figure 6).

With regards to Hans consumers, 10% had diabetes, 6.67% had hypertension (Figure 7). Patients with gutkha habits were most significantly affected with diabetes (16.67%) followed by hypertension (3.33%) and both diabetes and hypertension (3.33%) (Figure 8).

Figure 1. Bar graph represents the frequency distribution of patients with diabetes, hypertension or both with smokeless tobacco habits.

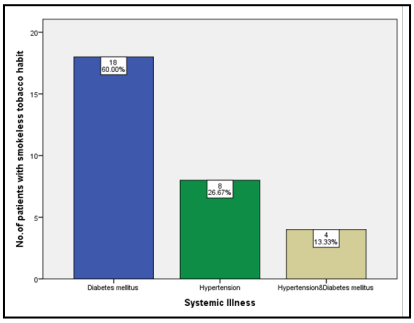

Figure 2. Bar graph represents the gender distribution of smokeless tobacco habits among patients with diabetes mellitus, hypertension or both.

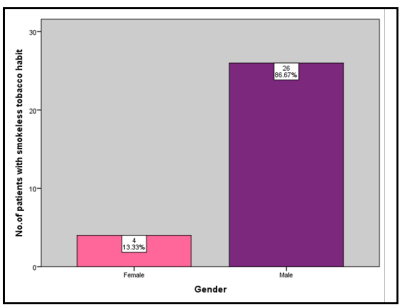

Figure 3. Bar graph represents the association of gender and type of smokeless tobacco habit.

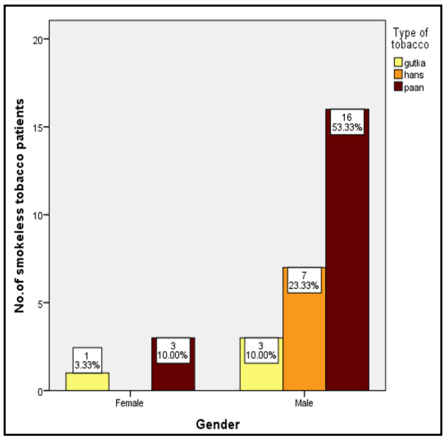

Figure 4. Bar graph represents the association of age and presence of diabetes, hypertension or both among patients with habits of chewing smokeless tobacco.

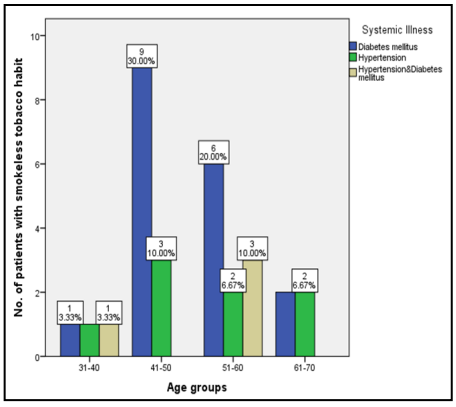

Figure 5. Bar graph represents association of gender and presence of diabetes, hypertension or both among patients with smokeless tobacco habit.

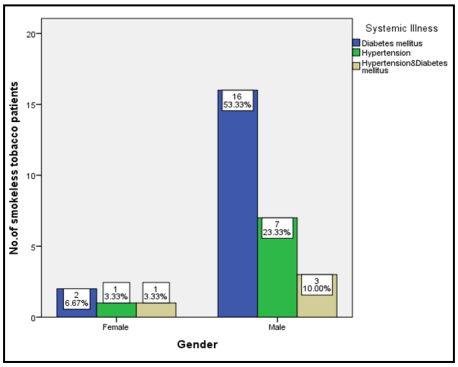

Figure 6. Bar graph represents association of paan chewing habit and presence of diabetes , hypertension or both among the patients with smokeless tobacco habit.

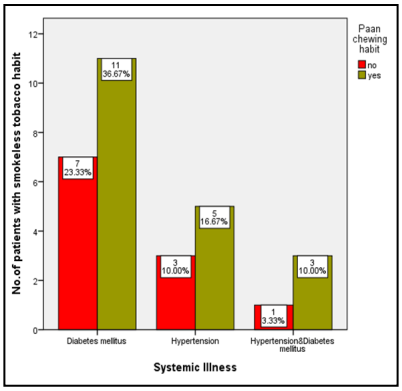

Figure 7. Bar graph shows association between Hans chewing with diabetes mellitus and hypertension.

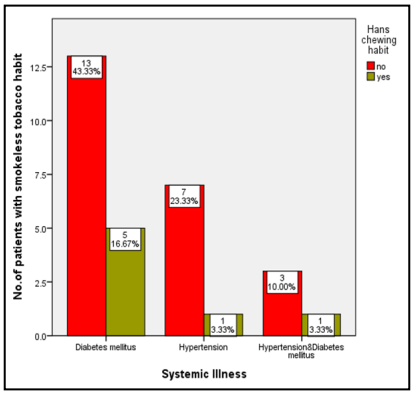

Figure 8. Bar graph shows association between gutkha chewing with diabetes mellitus, hypertension.

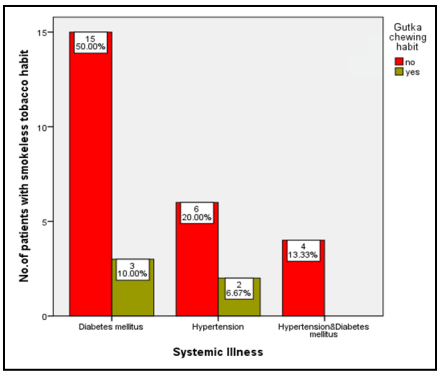

Table 1. Table showing frequency distribution of diabetes mellitus and hypertension among smokeless tobacco consumers.

Systemic Illness	Frequency	Percentage
Diabetes Mellitus	18	60%
Hypertension	8	26.67%
Diabetes Mellitus& Hypertension	4	13.33%

Table 2. Table showing frequency distribution of patients with paan chewing habits and had diabetes mellitus and hypertension.

		PAAN CHEWING HABIT PRESENT		Total
		no	yes	
SYSTEMIC ILLNESS	Diabetes mellitus	7	11	18
	Hypertension	3	5	8
	Hypertension and Diabetes mellitus	1	3	4
Total		11	19	30

Table 3. Table showing frequency distribution of patients with hans chewing habit and had diabetes mellitus and hypertension.

		HANS HABIT PRESENT		Total
		no	yes	
SYSTEMIC ILLNESS	Diabetes mellitus	13	5	18
	Hypertension	7	1	8
	Hypertension and Diabetes mellitus	3	1	4
Total		23	7	30

Table 4. Table showing frequency distribution of patients with gutkha chewing habit and had diabetes mellitus and hypertension.

		GUTKHA HABIT PRESENT		Total
		no	yes	
SYSTEMIC ILLNESS	Diabetes mellitus	15	3	18
	Hypertension	6	2	8
	Hypertension and Diabetes mellitus	4	0	4
Total		25	5	30

Table 5. Table showing association of paan, hans, gutkha chewing with Diabetes mellitus and hypertension using Chi-square test.

ASSOCIATION OF PAAN CHEWING WITH DIABETES MELLITUS AND HYPERTENSION			
	Value	df	AsymptoticSignificance (2-sided)
Pearson Chi-Square	.275a	2	0.871
Likelihood Ratio	0.289	2	0.866
N of Valid Cases	30		
ASSOCIATION OF HANS WITH DIABETES MELLITUS AND HYPERTENSION			
Pearson Chi-Square	.730a	2	0.694
Likelihood Ratio	0.799	2	0.671
N of Valid Cases	30		
ASSOCIATION OF GUTKA WITH DIABETES MELLITUS AND HYPERTENSION			
Pearson Chi-Square	1.200a	2	0.549
Likelihood Ratio	1.816	2	0.403
N of Valid Cases	30		

Smoking is known to have an influence in hypertension and other chronic diseases that result in mortality. Nicotine present in smokeless tobacco is known to raise blood pressure levels. Smokeless tobacco causes prolonged nicotine exposure when compared to the smoking forms. As smokeless tobacco is easily available and at a lower cost, the consumption of it is more in India [24].

In a study conducted in rural India, Smokeless tobacco exhibited higher values of diastolic BP and a higher prevalence of diastolic hypertension compared with non-smokeless tobacco users, or with users of smokeless tobacco plus smoked tobacco [25]. It has been, indicated that patients with Type II diabetes are more susceptible to a negative effect of nicotine on insulin sensitivity [26]. In a study conducted by Deo et al, it was found that the prevalence of diabetes and hypertension was more in patients who were aged less than 40 years. The result of this study is not in accordance to the present study where these systemic illnesses were more in the age group of 41-50 years [27].

In a study conducted by Sinha et al, it was found that males (32.9%) with smokeless tobacco consumption was more when compared to females. Similar results were obtained in the present study [28]. In the same study, it has also been shown that women with more smokeless tobacco consumption were prevalent in Bangladesh, Indonesia and Thailand.

In a study conducted by Greenhalgh et al., the contribution of betel nut to diabetes is contraindicated, which is not in accordance with the present study as 36.67%% of them had diabetes mellitus [29]. It has been studied that no effect of snuff use or smoking was seen on fasting glucose levels in three studies [30-32].

In the present study, it has been found that 10% of the patients who consumed hans had diabetes mellitus. There has been no study conducted on the consumption of Hans and its association with diabetes and hypertension.

In a study conducted by Roan et al, it has been found that the blood glucose level increases in patients consuming gutkha [33]. Similar results were obtained in our study. In a study done by Changrani et al, hypertension was cited as a harmful effect caused by gutkha [34]. In a study conducted by Lee et al,it was found that smokeless tobacco was associated with an increased risk of heart disease, [7] The overall consensus of the present study differs as it is conducted in a university set up with varying ethnicity. The limitations of the present study include small sample size and hence the results cannot be generalised to a larger population. Future prospective studies can be done to understand the smokeless tobacco habits influencing systemic illness.

Acknowledgement and Declaration

This study was supported by the institution by providing insights and expertise that greatly assisted the study. We would also like to thank the reviewers of the article for the valuable insights provided by them. There was no conflict of interest.

Conclusion

Within the limits of the study, it was found that diabetes and hypertension was most commonly present in the age group of 41-50 years. Males with habits of chewing smokeless tobacco were more than females. Diabetes mellitus was most commonly present in patients chewing paan, hans, gutkha. Though our study did not find a significant association of smokeless tobacco habit with diabetes mellitus and hypertension, the study suggests that the use of any form of tobacco would be an additional burden to the existing chronic systemic illness. Hence tobacco cessation programmes should be conducted to increase awareness, thus preventing their use.

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