Article published online: 2020-12-14

ORIGINAL ARTICLE Epidemiology of Cancer and Cancer Screening

Oral smokeless tobacco consumption pattern among rural Indian cancer patients: A prospective survey

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Abstract

Background: Oral tobacco consumption predisposes to cancer. The pattern of its use in rural Indian cancer patients is unknown. **Aim:** The aim of this study is to estimate the prevalence of oral tobacco consumption in cancer patients. **Objectives:** To identify oral tobacco consumption pattern with respect to demographic variables and clinical profiles in adult Indian rural cancer patients. **Materials and Methods:** All consecutive individual adult (age >18 years) patients diagnosed with any cancer and registered in the Medical Oncology Outpatient department were enrolled for questionnaire-based survey on oral tobacco consumption between July 2017 and October 2017. Demographic variables were also recorded, including income, education, and occupation. Frequency distribution and cross-tabulation were used for statistical analysis using SPSS version 17. **Results:** Of 517 cancer patients enrolled, 456 (88%) were rural. 230/517 (44%) consumed several forms of oral tobacco. Out of 230, 179 (78%) of them had dried tobacco leaves, whereas 23 (10%) and 26 (11%) had Gutkha and pan (betel leaves) alone, respectively. 63 (27%) consumed tobacco leaves and gutkha both. 163 (91%) of tobacco chewers were male, whereas 65% of pan chewers were male and 35% of females. About 48% of tobacco chewers were addicted since >20 years, whereas 13% started in the past 5 years. 47/179 (26%) of tobacco chewers were illiterate, whereas 13/179 (7.2%) were graduates. 106 (59%) had monthly income of between Rs. 5000–10,000. 57 (32%) and 40 (22%) were farmers and laborers, respectively. 25/215 (12%) housewives were addicted. 41/58 (70%) of the head-and-neck cancer patients consumed tobacco products, where 29/41 (70%) used dried tobacco leaves to chew. **Conclusion:** More than 40% of adult Indian rural cancer patients consume oral smokeless tobacco products. Dried tobacco leaves are the most common form of smokeless tobacco consumed.

Key words: Bihar, cancer, smokeless tobacco

Introduction

Oral cancer is a major healthcare problem in India.[1,2] Head and neck squamous cell carcinoma is the second most common cancer in Eastern India, with oral cavity cancer contributing as major sub-site.[3] About 50% of oral cavity cancer cases are attributed to smokeless tobacco consumption alone.[4] In India, across the general population, 28% of adult men and 12% of women consume oral smokeless tobacco products.[5,6] These values are often underestimated, especially in the context of Indians who live in rural heartlands, are poor and less educated. Moreover, the burden of smokeless tobacco consumption and its pattern of use among adult rural Indian cancer patients are largely unknown. We report a prospective survey of smokeless tobacco consumption pattern conducted among 517 consecutive adult cancer patients registered in our Institute.

Materials and Methods

Our institute is the Government Regional Cancer Centre (RCC) in one of the most populous Eastern Indian state, Bihar. For this study, our team of clinicians prepared a questionnaire pertaining to several forms of oral tobacco products consumed such as air-dried tobacco leaves, slaked lime tobacco (khaini), gutkha, betel quid, and pan masala along with their duration of consumption in years. We conducted a prospective survey with the above questionnaire in all consecutive adult cancer patients (age >18 years) reported and registered in the Medical Oncology Outpatient department (OPD) between July 2017 and October 2017. We also simultaneously collected data pertaining to demographic variables such as age, sex, income, education, occupation, and type of family. Clinical variables such as type and site of cancer were also recorded.

The survey was conducted through medical social worker who helped patients understand the questionnaire in simple language and assisted in data collection and recording. He also acted as unbiased third party between clinical staff and patients, who collected smokeless tobacco consumption data and demographic profiles only, whereas clinical indicators and profiles were collected and recorded by clinical staff members.

Descriptive statistics, including frequency distribution and cross-tabulation, was used in SPSS software version 17.0 (IBM Corp., USA) for data collection, recording, analysis, and reporting.

Results

Between July 2017 and October 2017, 517 adult consecutive cancer patients were registered in Medical Oncology OPD. 456 (88%) were from rural areas, constituting the majority. 230/517 (44%) consumed smokeless tobacco products. 179 (78%) were addicted to dried tobacco leaves and slaked lime tobacco (khaini), whereas 23 (10%) and 26 (11%) consumed gutkha and pan (betel quid) alone, respectively. 63 (27%) consumed tobacco leaves and gutkha both, whereas 51 (22%) were addicted to combine the use of khaini and pan. 110 (48%) of all patients who consumed smokeless tobacco were addicted for >20 years, whereas 64 (28%) were exploiting this habit since 10–20 years. 30 (13%) picked up tobacco in the past 5 years.

Demographic indices

The median age of patients consuming smokeless tobacco is 53 years, with range 19–80 years. Among oral smokeless tobacco consumers, the median age of khaini and pan chewers were 54 years and 59 years, respectively, but that of gutkha consumers was 36 years only. 163 (91%), 21 (91%), and 17 (65%) of tobacco, gutkha, and pan chewers exclusively were males, respectively. 9 (35%) of pan consumers were females [Table 1].

Access this article online
Quick Response Code:
Website: www.sajc.org
DOI: 10.4103/sajc.sajc_40_19

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How to cite this article: Pandey A, Singh A, Singh S, Kumar A, Das A, Shahi H, *et al*. Oral smokeless tobacco consumption pattern among rural Indian cancer patients: A prospective survey. South Asian J Cancer 2020;9:17-9.

Table 1: Demographic and socioeconomic profile of smokeless tobacco consumers

Demographic/social variables	Smokeless tobacco consumption (%)		Total
	Yes	No	
Sex			
Male	203 (69)	93 (31)	296
Female	27 (12)	194 (88)	221
Married			
Yes	224 (45)	272 (55)	496
No	6 (28)	15 (72)	21
Family type			
Joint	181 (46)	207 (54)	388
Nuclear	49 (38)	80 (62)	129
Religion			
Hindu	197 (44)	248 (56)	445
Muslim	33 (46)	39 (54)	72
Education			
Illiterate	59 (37)	102 (63)	161
Primary school only	38 (38)	61 (62)	99
Secondary school only	52 (56)	40 (44)	92
Tenth standard only	38 (59)	26 (41)	64
Twelfth standard only	22 (54)	19 (46)	41
Graduates	19 (37)	32 (63)	51
Postgraduates	2 (22)	7 (78)	9
Income			
<5000	27 (59)	19 (41)	46
5000-10,000	143 (44)	183 (56)	326
10,000-20,000	32 (39)	49 (61)	81
21,000-30,000	15 (45)	18 (55)	33
31,000-50,000	12 (43)	16 (57)	28
>50,000	1 (33)	2 (67)	3
Occupation			
Skilled agriculture	71 (74)	25 (26)	96
Elementary occupation	49 (70)	21 (30)	70
Managers	2 (50)	2 (50)	4
Armed forces	1 (50)	1 (50)	2
Professionals	15 (45)	18 (55)	33
Technicians	6 (60)	4 (40)	10
Clerical support	7 (64)	4 (36)	11
Service/sales	18 (66)	9 (34)	27
Craft related	20 (91)	2 (9)	22
Plant/machine operators	11 (85)	2 (15)	13
Housewives	25 (12)	190 (88)	215
Students	5 (36)	9 (64)	14

Socioeconomic indices

60/230 (26%) of smokeless tobacco consumers were illiterate. 38 (16%), 52 (23%), 38 (16.5%), 22 (9.5%), and 19 (8%) had education stratified as primary school, secondary school, tenth standard, twelfth standard and graduation, respectively. 143 (62%) reported monthly income of Rs. 5000–10,000, whereas 27 (12%) earned Rs. <5000/month. 32 (14%), 15 (6.5%), and 13 (5.6%) reported monthly income of Rs. 10,000–20,000, Rs. 20,000–30,000, and Rs. >30,000, respectively. 71 (31%) of smokeless tobacco consumers were farmers, 49 (21%) are laborers, whereas 25 (11%) are homemakers/housewives [Table 1].

Clinical indices

41/58 (70%) of the head-and-neck cancer patients were addicted to smokeless tobacco, of which 29 (70%) consumed khaini. Among other prominent cancers, 63/106 (60%) of gastrointestinal cancers, 19/35 (54%) of lung cancers and 21/37 (56%) of genitourinary cancers consumed smokeless tobacco, predominantly dried tobacco leaves. In contrast, 6/41 (14%) of gynecological cancers consumed tobacco products [Table 2].

Discussion

Smokeless tobacco is the form of tobacco consumed orally or nasally without burning. They are often placed in the mouth, check, lips, or snuffed. In India, dried tobacco leaves slaked lime (khaini) and betel quid (pan) are the most common form of oral tobacco consumed. Tobacco also constitutes an active ingredient of concoction used as toothpowder (gul) or pastes. Gutkha, which is chewing tobacco preparation, made of crushed areca nut, tobacco, catechu, paraffin wax, slaked lime, and sweet/savory flavorings are ubiquitous in India across thoroughfare and are not uncommon to be sold by peddlers in conspicuous packets for vulnerable consumers.[6] Smokeless tobacco contains >30 known carcinogens with predominance of nitrosamines, nitrosamic acid, polycyclic hydrocarbons, aldehydes, and metals.[7] Their consumption has been proven to be a cause of oral cavity cancer, esophageal, pancreatic cancer, and strongly associated with lung cancer.[8-10]

In national cross-sectional household survey conducted in India, 30% of population wither smoked or chewed tobacco with poor socioeconomic factors predicting higher prevalence.[4] Subramanian *et al*. in another cross-sectional analysis conducted through national family health survey reiterated above fact with Eastern and North Eastern States in India surpassing other states for tobacco consumption with the crude prevalence of 35%–50% and >50%, respectively.[11] In global adult tobacco survey-India, rural areas (38.4%) toppled urban areas (25.3%) in tobacco prevalence, whereas khaini (12%) emerged as the most popular form of smokeless tobacco abuse.[12] Even in states where smoking was more prevalent, stringent ban on it have lured people to switch to oral smokeless tobacco recently, thus shooting up its prevalence.[13] In a survey conducted in 0.1 million households smokeless tobacco use (22%) surpassed bidi (17%) and cigarette smoking (4%) with rising socioeconomic profile inversely proportional to smokeless tobacco and favoring higher cigarette consumption.[14] It also places Bihar as the state with the highest percentage (57%) of households consuming smokeless tobacco.[14] In another cross-sectional study of villagers in Bihar, smokeless tobacco use had 33% prevalence with khaini (57%) as predominant choice.[15]

It is alarming to note the rising prevalence of tobacco use in vulnerable groups such as school students, where the survey highlight the current prevalence of 18%.[16] Another study confirms that 50% of tobacco consumers start forming habit in childhood or adolescence.[17] Medical Professionals are also not aloof from tobacco use, with prevalence among physicians stand around 15%.[18] Smokeless tobacco use increases the relative risk of begetting oral cancer between 1.8 and 5.8 and that of esophageal cancer between 2.1 and 3.2.[19] It also

Table 2: Cancer site distribution among smokeless tobacco consumers

Cancer site/group	Smokeless tobacco consumption (%)		Total
	Yes	No	
Gastrointestinal	63 (59)	43 (41)	106
Gall bladder	23 (28)	60 (72)	83
Hemato-lymphoid	45 (51)	43 (49)	88
Head neck	41 (70)	17 (30)	58
Gynecology	6 (13)	41 (87)	47
Genitourinary	21 (57)	16 (43)	37
Breast	2 (6)	34 (94)	36
Lung	19 (54)	16 (46)	35
Sarcoma	4 (44)	5 (55)	9
Others	8 (44)	10 (55)	18

increases the risk of stillbirths and low-birth-weight neonates by three-fold among pregnant women.[19] While majority of published literature has focused to find out prevalence of tobacco use by conducting individual or household surveys in the general population or in vulnerable population cohorts, there is lack of any prospective or cross-sectional data analysis on smokeless tobacco prevalence and pattern of its use among diagnosed adult cancer patients across several cancer types in India.

Our institute is the lone government RCC in the state of Bihar, India where predominantly rural cancer patients with low socioeconomic and demographic profile receive subsidized or free treatment under government-funded schemes. We conducted a prospective survey of smokeless tobacco consumption among consecutive adult cancer patients and correlated it with socioeconomic, demographic, and clinical variables to illicit the variance in pattern and type of tobacco use across several patient subgroups. 230/517 (44%) cancer patients consumed smokeless tobacco, of which 78% were addicted to khaini. While 12% of homemakers consumed tobacco, 35% of all betel quid chewers were females. About 48% of patients were addicted to tobacco since >20 years. Among abusers, quarters of them (26%) were illiterate, whereas 59% had monthly income of Rs. <10,000. Among a predominantly rural population (88%), 54% of tobacco abusers were farmers and laborers. More than two-thirds (70%) of the head and neck cancer patients were habituated with regular tobacco abuse.

Being a prospective study, conducted primarily by social worker, who acted as a neutral third party, our data are more comprehensive, complete and relatively unbiased as patients have divulged their tobacco habits unrestrained without any qualms or apprehension, as none of the clinicians played active role in the interview process. Limitation of being a one-time cross-sectional survey, we cannot predict whether abusers will stop using tobacco or consume it unabated despite being diagnosed with cancer. However, this study will sensitize physicians dealing with cancer patients regarding the current gravity of the problem and help health authorities form policies to de-addict these patients after successful cancer treatment to reduce recurrences and improve survival outcomes.

Conclusion

Smokeless tobacco consumption is highly prevalent among adult rural Indian cancer patients. Majority of abusers are poor, less educated, and engaged as farmers or laborers. More than two-third head-and-neck cancer patients consume oral tobacco products. Awareness against tobacco use at the grass root level is urgently merited, and concrete health policies to de-addict cancer survivors are need of the hour.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Sankaranarayanan R, Ramadas K, Thomas G, Muwonge R, Thara S, Mathew B, *et al.* Effect of screening on oral cancer mortality in Kerala, India: A cluster-randomised controlled trial. Lancet 2005;365:1927-33.
2. Sharma S, Satyanarayana L, Asthana S, Shivalingesh KK, Goutham BS, Ramachandra S, *et al.* Oral cancer statistics in India on the basis of first report of 29 population-based cancer registries. J Oral Maxillofac Pathol 2018;22:18-26.
3. Boffetta P, Hecht S, Gray N, Gupta P, Straif K. Smokeless tobacco and cancer. Lancet Oncol 2008;9:667-75.
4. Rani M, Bonu S, Jha P, Nguyen SN, Jamjoum L. Tobacco use in India: Prevalence and predictors of smoking and chewing in a national cross sectional household survey. Tob Control 2003;12:e4.
5. Global Adult Tobacco Survey. India; 2016-17. Available from: https://www.who.int/tobacco/surveillance/survey/gats/GATS_India_2016-17_FactSheet.pdf. [Last accessed on 2019 Jan 31].
6. Cancer Patient Aid Association. Available from: http://www.cpaaindia.org/activities/projects.htm#gutkha. [Last accessed on 2019 Jan 31].
7. IARC. Betel-Quid and Areca-Nut Chewing. IARC Monographs on the Evaluation of Carcinogenic risks to Humans. Betel-Quid and Areca-Nut Chewing and some Areca-Nut-Derived Nitrosamines. Vol. 85. Lyon: IARC Press; 2004. p. 39-278.
8. Merchant A, Husain SS, Hosain M, Fikree FF, Pitiphat W, Siddiqui AR, *et al.* Paan without tobacco: An independent risk factor for oral cancer. Int J Cancer 2000;86:128-31.
9. Boffetta P, Aagnes B, Weiderpass E, Andersen A. Smokeless tobacco use and risk of cancer of the pancreas and other organs. Int J Cancer 2005;114:992-5.
10. Hecht SS. Tobacco smoke carcinogens and lung cancer. J Natl Cancer Instit 1999;91:1194-210.
11. Subramanian SV, Nandy S, Kelly M, Gordon D, Davey Smith G. Patterns and distribution of tobacco consumption in India: Cross sectional multilevel evidence from the 1998-9 national family health survey. BMJ 2004;328:801-6.
12. Bhawna G. Burden of smoked and smokeless tobacco consumption in India – Results from the global adult tobacco survey India (GATS-India)- 2009-201. Asian Pac J Cancer Prev 2013;14:3323-9.
13. Thankappan KR, Thresia CU. Tobacco use & social status in Kerala. Indian J Med Res 2007;126:300.
14. Agrawal S, Karan A, Selvaraj S, Bhan N, Subramanian SV, Millett C, *et al.* Socio-economic patterning of tobacco use in Indian states. Int J Tuberc Lung Dis 2013;17:1110-7.
15. Sinha DN, Gupta PC, Pednekar MS. Tobacco use in a rural area of Bihar, India. Indian J Community Med 2003;28:167-70.
16. Pal R, Tsering D. Tobacco use in Indian high-school students. Int J Green Pharm 2009;3:319-23.
17. Bala DV, Bodiwala IN, Patel DD, Shah PM. Epidemiological determinants of tobacco use in Gujarat state, India. Indian J Community Med 2006;31:346-4.
18. Mohan S, Pradeepkumar AS, Thresia CU, Thankappan KR, Poston WS, Haddock CK, *et al.* Tobacco use among medical professionals in Kerala, India: The need for enhanced tobacco cessation and control efforts. Addict Behav 2006;31:2313-8.
19. Gupta PC, Ray CS. Smokeless tobacco and health in India and South Asia. Respirology 2003;8:419-31.