RESEARCH ARTICLE

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The Need for Nicotine De-addiction Services among Newly Diagnosed Tobacco-Related Head and Neck Cancer Patients, South India

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Abstract

Objectives: This study aimed to determine the proportion of tobacco-related head and neck cancer patients in need of nicotine de-addiction services at the time of diagnosis and factors associated with it. **Methods:** Facility-based cross-sectional study was conducted in a tertiary care center. Tobacco-related head and neck cancer patients with a past and present history of tobacco usage registered in cancer clinic from March 2016 to February 2017 were recruited. Participants were interviewed using a pretested and semi-structured questionnaire to gather information on the socio-demographic, clinical characteristics, and tobacco usage. Data were entered in EpiData v3.1 and analyzed using STATA v14. **Results:** Among 220 participants recruited in the study, 83% were males, 47% were >60 years of age, and 40% had no formal education. Around 49% were smoking tobacco during the treatment period, 41% used smokeless tobacco, and 10% used both smoking and smokeless. The majority (56%) of them had stage T4 tumors. Around 71% of participants required de-addiction services. Those of age more than 70 years (aRR (95%CI) 1.43 (1.1-1.9)), currently employed (aRR (95%CI) 1.5 (1.2-1.9)), living alone (aRR (95%CI) 1.6 (1.0-2.5)) or in a nuclear family (aRR (95%CI) 1.5 (1.2-2)), who initiated tobacco use at a younger age (aRR (95%CI) 1.5 (1.0-2.2) were in higher need of de-addiction services. **Conclusion:** The majority of tobacco-related head and neck cancer patients required nicotine de-addiction treatment. Hence de-addiction services should be established as an integral unit of cancer clinics.

Keywords: Head and neck cancer- tobacco smoking- smokeless tobacco use- South India

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Introduction

Carcinoma of the head and neck is the seventh most common cancer globally, with 890,000 new cases and 450,000 deaths per year (Chow, 2020). In India, Head and Neck cancer accounts for one-third of all cancers (Shah et al., 2016). Head and neck cancers include those tumours which occur at the lip, oral cavity, nasopharynx, oropharynx, hypopharynx, larynx, and paranasal sinus (National centre for Disease informatics and research national cancer registry programme India, 2013). Tobacco is the single most significant risk factor for head and neck cancer. Almost 85% of head and neck cancers are linked to tobacco usage, contributing to 22% of cancer-related morbidity (Kulkarni, 2013; Global Burden of Disease 2013 risk factors collaborators, 2016). In India, tobacco use contributed to around 50 to 70% of head and neck cancers (National centre for Disease informatics and research national cancer registry programme India, 2013).

Tobacco use is not only a risk factor for the development of cancer, but it also has negative impacts on the health of cancer patients if they continued to use it while on treatment (Hatcher et al., 2016). Tobacco use includes smoking cigarettes, cigars, or pipes, chewing smokeless tobacco, and snuff. Any form of tobacco use will cause a similar ill effect on the user. Continued tobacco use after the diagnosis of cancer increases the risk of developing other tobacco-related diseases (Anthonisen et al., 2005). Continued tobacco use also leads to a secondary tumor, treatment failure, increased side effects of treatment, and decreased survival rate among cancer patients. It also decreases the efficacy of surgical, chemoradiation treatments and reduces the quality of life (Baser et al., 2006; Parsons et al., 2010; Sitas et al., 2014; Grotenhuis

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et al., 2015). Abstinence from tobacco use is associated with less pain and lower physical symptoms (Florou et al., 2014). The impacts of continued tobacco use mentioned above increase mortality and morbidity and reduce people's quality of life (Florou et al., 2014).

Even though cancer diagnosis acts as an eye-opener to quit tobacco, a significant proportion of the patients continue to use tobacco (Ostroff et al., 1995; Duffy et al., 2006; MaCarter et al., 2016). Studies done in the USA show that continued tobacco use after a cancer diagnosis is around 56% (Burke et al., 2009; Chen et al., 2014). A study conducted among head and neck cancer patients who were planned for surgery showed that 85% of the participants had a history of tobacco use in whom 30% participants reported that they continue to use tobacco and 43% had tested urine nicotine positive on the day of surgery (Hatcher et al., 2016). It shows that there is need of deaddiction program targeting cancer patients to reduce the tobacco consumption and avert the risk of further complications due to tobacco. Complete cessation of all forms of tobacco products is the most critical action to reduce their risk of second primary tumours and poor prognosis. With this background, our study aimed to determine the proportion of head and neck cancer patients with a history of tobacco use, in need of de-addiction treatment at the time of diagnosis and factors associated with it.

Materials and Methods

Study design and setting: This study was conducted in a tertiary care centre in Puducherry. This study was the baseline survey of a follow-up study conducted from March 2016 to February 2017. Participants were recruited from the tumour clinic organized by the Department of Ear Nose and Throat (ENT) every Tuesday in the outpatient department. It provides free treatment for patients in collaboration with the same tertiary care centre's Regional Cancer Center. Around 25 to 30 new tobacco-related head and neck cancer patients get registered in tumour clinic every month.

Study Population

Tobacco-related head and neck cancer patients with a history of tobacco use, registered in the tumour clinic from March 2016 to February 2017 were included in the study. Critically sick patients who were not able to complete the interview were excluded from the study.

Sample size and sampling method

Assuming that the proportion of patients in need of de-addiction services at the time of diagnosis as 50% (Ostroff et al., 2013) with 95% confidence level, 15% of relative precision, and 10% of non-response rate sample size was calculated to be 188. We included all eligible individuals registered on the alternative tumour clinic conducted during the study period.

Study Procedure

All newly registered tobacco-related head and neck cancer patients diagnosed in the study period were screened for the history of tobacco use and other inclusion criteria. After obtaining written informed consent from the participants, they were interviewed using a pre-designed and pretested semi-structured questionnaire. The questionnaire was refined by pretesting on 20 participants. It collected information on socio-demographic details, clinical characteristics, and tobacco use. The response of the participant on continued tobacco use was counter verified from the participant's attender. If there were discrepancies in the response, the interviewer clarified the tobacco use history with the participant quoting his/her attender's response. The response of the participant to the second iteration was noted. Operational definitions are given in Box 1

Statistical methods

Data were entered using EpiData software version 3.1 (EpiData Association, Odense, Denmark). The age of the patients was summarized using mean and standard deviation (SD). Categorical variables like gender, type of family, marital status, religion, education categories, occupation status, site of cancer, type of cancer, stage of cancer, treatment, type of tobacco used were summarized using percentages.

The proportion of participants who were in need of nicotine de-addiction treatment was expressed in terms of percentage with 95% confidence interval. Factors associated with the need for de-addiction services were tested using the chi-square test, and the strength of association was expressed as prevalence rate ratio with 95% confidence interval. Multivariate analysis was done for variables that are found significantly associated with the need for de-addiction services in univariate analysis (p-value <0.05). Multivariate analysis was done in STATA statistical software version 11 (StataCorp LP. College Station, TX).

Ethical consideration

The study protocol was reviewed and approved by the Post Graduate Research Monitoring Committee and Institute Ethics Committee (Human studies). Written informed consent was obtained from the study participants before enrolment into the study.

Results

A total of 220 participants were recruited for the study. Among them, 83% were males, and 47% were more than 60 years of age. Around 40% of the study participants did not have any formal education, and 58% were not employed at the recruitment time. Most of them were married (81%) and lived in a nuclear family (66%). Half of the participants were using tobacco smoke, and 10% were using both smoke and smokeless form of tobacco. Around 51% of participants started using tobacco at the age of 15-25 years. The duration of tobacco use was 20-40 years for 49% and more than 40 years for 38% of the study participants. The most common cancer site was the oral cavity (60%), followed by the oropharynx (24%). The majority of the study participants were diagnosed with T4 stage of cancer (56%), and 63% had Lymph node

Table 1. Socio-Ddemographic Characteristics of Tobacco Related Head and Neck Cancer Patients with History of Tobacco Use (N=220)

Socio-Demographic characteristics	Frequency	(%)
Gender		
Male	182	83
Female	38	17
Age group (years)		
30 – 39	13	6
40 – 49	35	16
50 – 59	69	31
60 – 69	70	32
>70	33	15
Education*		
No formal education	88	40
Less than class 5	17	8
Class 5 to class 8	72	33
Class 9 and above	43	19
Occupational status at recruitment		
Unemployed	127	58
Employed	93	42
Type of family		
Nuclear	145	66
Three generation/Joint family#	61	28
Living alone	14	6
Marital status		
Currently married	179	81
Widow / widower	33	15
Never married	8	4

Table 2. Disease Ccharacteristics and Tobacco Use Pattern of Tobacco Related Head and Neck Cancer Patients with History of Tobacco Use (N=220)

Characteristics	Frequency	(%)
Type of Tobacco		
Smoke form	108	49
Smokeless form	91	41
Both	21	10
Age of initiation of tobacco use (years)		
<15	74	34
15 – 25	112	51
>25	34	15
Duration of tobacco use (years)		
<20	28	13
20 – 40	107	49
>40	85	38
Site of cancer		
Oral	132	60
Oropharynx	53	24
Larynx	32	16
Hypopharynx	3	1
Tumour staging		
T1 – T2	32	14
T3	66	30
T4	123	56
Lymph node metastasis		
Present	138	63
Absent	82	37
Treatment		
Radiotherapy	137	62
Surgery	32	15
Chemotherapy + Radiotherapy	29	13
Surgery + Radiotherapy	22	10

metastasis. The socio-demographic, clinical, and tobacco use patterns are depicted in Tables 1 and 2.

Overall, 71% (95% CI: 65% - 77%) of the participants needed nicotine de-addiction treatment since they were using tobacco at the time of diagnosis. On univariate analysis, the need for nicotine de-addiction treatment was higher among males (RR(95%CI) 1.4(1-1.8)), younger age group participants, with lower education status, living alone (RR(95%CI) 1.4 (1-2.1)), or in a nuclear family (RR(95%CI) 1.4 (1.1-1.8)). Also, participants who used smoke (RR(95%CI) 1.3 (1.1-1.6)) or both (smoke and smokeless) form of tobacco and started tobacco use at an early age (RR(95%CI) 1.6 (1.1-2.2)) were in higher need of nicotine de-addiction services (Table 3).

On multivariate analysis, the need for nicotine de-addiction treatment was higher among extremes of age (younger than 40 years and older than 70 years (aRR(95%CI) 1.4 (1-1.9)), those with lower education and living alone (aRR(95%CI) 1.6 (1-2.52)), or in a nuclear family (aRR(95%CI) 1.5 (1.2-1.9). Also, the participants with tobacco initiation below 15 years of age (aRR(95%CI) 1.5 (1-2.2) and with lymph node metastasis (aRR(95%CI) 1.4 (1.2-1.8) were in higher need of nicotine de-addiction services (Table 4).

Discussion

The current study conducted among tobacco-related head and neck cancer patients registered in the tertiary care center's tumor clinic showed that 71% (95% CI: 65% - 77%) needed nicotine de-addiction treatment at the time of diagnosis of cancer. This proportion varied in different studies due to differences in operational definition, study population, and data collection methods, and the time of assessment of exposure. Chen et al., 2014 reported that 33% were smoking at the time of cancer diagnosis, and it is lower than that observed in our study. This difference could be related to the difference in the data collection method. Chen et al., 2014 collected the data from records routinely maintained in the health center (Chen et al., 2014). Therefore, there is a higher chance of information bias than the interview-based data collection done in our study. A study by Tan et al. reported the number who did not quit smoking at the time of diagnosis was lower (49%) than that found in our study (71%). However, the research done by Tan had a smaller sample size (n=56)

Table 3. Factors Associated with Participants in Need of Nicotine de-addiction Services among Tobacco Related with Head and Neck Cancer Patients (n=220)

Characteristics	In need of nicotine de-addiction, n (%)	RR	95% CI
Gender			
Male	136 (75)	1.4	(1.0-1.8) *
Female	21 (55)	Reference	
Age group (years)			
30 – 39	13 (100)	Reference	
40 – 49	29 (83)	0.9	(0.8 – 1.1)
50 – 59	35 (51)	0.6	(0.4 – 0.7) #
60 – 69	51 (73)	0.8	(0.7 – 1.0)
>70	29 (88)	0.9	(0.8 – 1.0) *
Education*			
No formal education	67 (76)	Reference	
Class 1 to class 5	7 (41)	0.5	(0.3-1.0) *
Class 6 to class 8	58 (81)	1	(0.9-1.2)
Class 9 and above	25 (58)	0.8	(0.6-1.0)
Occupation			
Unemployed	81 (64)	Reference	
Employed	76 (82)	1.3	(1.1-1.5) *
Type of family			
Living alone	11 (79)	1.4	(1.0-2.1) *
Nuclear	113 (78)	1.4	(1.1-1.8) *
Joint/three-generation	33 (54)	Reference	
Type of Tobacco			
Smokeless form	53 (58)	Reference	
Smoke form	83 (77)	1.3	(1.1-1.6) *
Both smoke and smokeless	21 (100)	Not calculated	
Age of initiation of tobacco use (years)			
<15	58 (78)	1.6	(1.1-2.2) *
15 – 25	82 (73)	1.5	(1.0-2.1) *
>25	17 (50)	Reference	
Duration of tobacco use (years)			
<20	15 (54)	Reference	
20 – 40	79 (74)	1.4	(0.9-2.0)
>40	63 (74)	1.4	(0.9-2.0)
Site of cancer			
Oral	87 (66)	1.2	(0.8-1.6)
Oropharynx	49 (92)	1.6	(1.2-2.2) *
Larynx	18 (56)	Reference	
Hypo pharynx	3 (100)	Not calculated	
Tumour Staging			
T1 – T2	21 (66)	1	(0.7-1.3)
T3	55 (83)	1.2	(1.1-1.5) *
T4	81 (66)	Reference	
Lymph node metastasis			
Present	111 (80)	1.4	(1.2-1.8) #
Absent	46 (56)	Reference	

* p value<0.05; # p value <0.001

with high non-response/loss to follow up (55%) (Tan et al., 2011). Also, a higher proportion of the participants were in the advanced stage. Patients with advanced stages of cancer tend to ignore their health and continue to use

Table 4. Multivariable Analysis of Factors Associated with Participants in Need of Nicotine de-addiction Services among Tobacco Related with Head and Neck Cancer Patients (N=220)

Characteristics	aRR	95% CI	p value
Gender			
Male	1.06	0.79-1.42	0.68
Female		Reference	
Age group (years)			
30 – 39		Reference	
40 – 49	0.94	0.76 – 1.17	0.61
50 – 59	0.63	0.50 – 0.80	<0.001
60 – 69	1.03	0.86 – 1.23	0.86
>70	1.43	1.09-1.89	0.01
Education*			
No formal education		Reference	
Less than Primary schooling	0.5	0.35-0.70	<0.001
Primary schooling	0.84	0.70-1.02	0.08
Secondary and above	0.63	0.48-0.83	0.001
Occupation			
Unemployed		Reference	
Employed	1.51	1.22-1.86	<0.001
Type of family			
Living alone	1.6	1.01-2.52	0.04
Nuclear	1.54	1.22-1.95	<0.001
Joint family#		Reference	
Type of Tobacco			
Smokeless form		Reference	
Smoke form	0.92	0.73-1.51	0.47
Both	1.07	0.81-1.42	0.58
Age at starting tobacco use (years)			
<15	1.49	1.02-2.18	0.03
15 – 25	1.36	0.92-1.99	0.11
>25		Reference	
Tumour Staging			
T1 – T2	0.96	0.76-1.20	0.73
T3	1.23	1.01-1.48	0.03
T4		Reference	
Lymph node metastasis			
Present	1.44	1.16-1.79	0.001
Absent		Reference	

tobacco. A study conducted in South Korea among all cancer patients attending a tertiary care setting reported similar results (80%) compared to the current research (Park et al., 2009). Our study findings necessitate the need for de-addiction services coupled with cancer clinics to provide comprehensive cancer care and improve clinical outcomes. Head and neck cancer symptoms alarm the patients about tobacco use and make it challenging to use tobacco. Unfortunately, tobacco addiction and withdrawal symptoms make many patients fail to quit tobacco use. Hence there is a need to incorporate de-addiction services such as continuous tobacco use screening and cessation programs as a part of standard clinical care at the cancer center to decrease cancer-related morbidity and improve the quality of life.

The current study found that the need for nicotine de-addiction treatment was higher among males and those currently employed. The higher need among males may be due to their continued exposure to factors (a peer of tobacco users, workplace), which stimulates them to use tobacco. It is further supported by the increased need for de-addiction among employed participants (82%) compared to the unemployed (64%). Also, most of the females were dependent on other family members to get tobacco, which might have helped prevent tobacco usage after developing cancer. These findings highlight the importance of involving family members and peers related to patients' nicotine de-addiction services.

Ostroff et al. reported that patients in the age group of 18 – 39 years had a higher risk of continuing tobacco, which is similar to our finding (Ostroff et al., 2013). A few studies found that as age increases, there is a reduced chance of continuing tobacco use (Lambert et all., 2005; Cooley et al., 2009). But our research found that in older age groups, tobacco use was high. Many older age participants expressed a lack of social and family responsibilities, which led to reduced motivation to change risky behavior. Lack of family support and emotional bonds might be why a higher proportion of tobacco use among participants living alone (PR=1.45) and in a nuclear family (PR=1.44). It recommends the need for social rehabilitation to address nicotine addiction for cancer patients who are living alone. Participants who started using tobacco at a younger age (<15 years) were in higher need of nicotine de-addiction services (PR=1.56). Those with prolonged use of tobacco might have higher dependence, contributing to a higher demand for de-addiction.

Strengths

Good quality data with triangulation of data from the patients and their family members is a strength of this study. Data entry errors were minimized by using EpiData v3.01 software with extensive inbuilt checks. There was a possibility of social desirability bias, which was reduced by explaining the purpose, data confidentiality, and implications of the study. Limitations: The research was done in a tertiary care centre that might have referral bias since patients with an advanced cancer stage were usually referred to higher centres.

In conclusion, three out of four tobacco-related head and neck cancer patients needed nicotine de-addiction treatment. Hence there is a need to establish nicotine de-addiction services coupled with cancer clinics to provide comprehensive cancer care.

Author Contribution Statement

BN, MT and SG were involved in all stage of the study. JP and SSK were involved in every stage of the study except in data collection. MS was involved in data collection and data analysis.

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Ethical issue

Institute Ethics Committee (Human studies), JIPMER approved the study and consent was taken from the participant before including in the study.

Conflict of interest

Authors report no conflict of interest.

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