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Original Article

"Vaai Ganam" - a screening program for early detection of oral potentially malignant disorders and oral cancer among truck drivers in Chennai – A cross-sectional survey

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ABSTRACT

Introduction: Truck drivers, though forming an integral part of a vital trade link for the Indian population, lack basic life insurance and health care benefits offered by other organized sectors in Indian Industries. This paper aims to present the initial findings of the "VaaiGanam" program which proposes to identify tobacco use and the prevalence of Oral potentially malignant disorders (OPMDs) among truck drivers who are stationed or passing via Chennai and provide cessation services by behavioral therapy.

Methods: This cross-sectional study was conducted by a dental screening team who were involved in data collection and screening of the 747 truck drivers who fulfilled the inclusion and exclusion criteria between Jan to Oct 2022. After data collection, oral examinations were done and suspicious lesions were sought for expert opinion. A standard punch biopsy was taken from those lesions requiring confirmation.

Results: Among the 747 subjects who participated in this program, 704 (94.2%) were current users of various tobacco products, with 235 (31.4%) preferring smoking and the rest 469 (62.8%) using smokeless tobacco products. Oral mucosal lesions were recorded in 49 (6.5%) of the study population, mostly among tobacco users. Punch/incisional biopsies were taken among 17 of the 49 subjects and oral dysplasia was histopathologically confirmed in 9 (mild epithelial dysplasia = 5; moderate epithelial dysplasia = 4) subjects.

Conclusion: Truck drivers with tobacco and substance abuse are at high risk of developing oral cancer and hence this study emphasizes the importance of periodic oral cancer screening programs for this vulnerable population to identify potentially malignant oral lesions at an early stage.

Keywords: Malignant lesions, oral cancer, oral potentially, screening, tobacco use, truck drivers

Introduction

Truck drivers have always been the trade link of the Indian population as they help to transfer goods and essentials across this country. In this relatively unorganized sector, 8 million truck drivers are engaged in transporting goods along the second-largest road network in the world. The health status of this at-risk population has been an area of recent focus as many studies have reported a higher health burden among this population.[1,2] Though many risk behaviors could be attributed to this, an altered lifestyle has been cited as a primary risk factor for this excessive disease burden. A focus group of long-haul truck drivers reported that despite a desire to eat healthy food, time constraints and the high cost of maintaining a healthy lifestyle while traveling prevent them from adopting them and resorting to unhealthy behavioral patterns.[3] Other factors inhibiting a healthy lifestyle include excessive non-driving work time spent in areas where there is a scarcity of healthy food, lack of opportunity to seek out food options and engage in physical activity, and the influence of peer groups advocating substance abuse, tobacco, and alcohol use as a means of recreation and bonding. Hence it can be implied that lifestyle choice has also been identified as a factor influencing the health and well-being of truck drivers.[4]

Many of these truck drivers are members of the All India Transporters Welfare Association and All India Road Transport Workers' Federation. Despite being part of an organization, many of them lack basic life insurance and health care benefits offered by other organized sectors in Indian Industries. The primary focus of the association is settling wage disputes and ensuring the timely transport of goods. As a result of undue stress and lack of basic amenities during travel, many truck drivers adopt unhealthy lifestyle practices to overcome their physical and mental fatigue. Of late the governmental authorities have identified this marginalized community and have initiated various health schemes for their welfare. Oral potentially malignant disorders (OPMDs) are defined as "any oral mucosal abnormality that is associated with a statistically increased risk of developing oral cancer".[5] OPMDs present with diverse clinical attributes, such as color variations (white, red, and mixed white-red), morphological changes (plaque/plateau, smooth, grooved, wrinkled, granular, atrophic), and different sizes, involving different anatomical sites in the oral cavity. The habits of betel quid chewing, tobacco smoking, and alcohol drinking, as well as their synergistic effects, are important risk factors for the prevalence of oral cancer and OPMDs.[6,7] The overall malignant transformation (MT) rate of OPMDs to oral cancer is 7.9%.[8]

The Indian Council of Medical Research has recently funded a project "SCOPE – Self Screening and Care for Oral Cancer Prevention and Eradication - A Model for Long Distance Heavy Vehicle Drivers', at Pondicherry, India. With a similar objective, a dental college in Chennai, India along with World Vision, an NGO had developed a program named "Vaai – Ganam" which translates as "Vaai" meaning mouth, and "Ganam" meaning burden in Tamil, the local dialectic. This word was derived from "Vaganam" which translates as vehicle. This program proposes to identify tobacco use and the prevalence of Oral potentially malignant disorders (OPMDs) among truck drivers who are stationed or passing via Chennai and provide cessation services by behavioral therapy.

The participants were subjected to oral examination, and counseling for tobacco cessation. Toluidine blue staining to aid in the early identification of potentially malignant and malignant oral lesions with subsequent histological confirmation with biopsy was an integral part of the program. Appropriate referral and medical assistance were also provided to all participants. This paper aims to present the initial findings of this project with a focus on the prevalence of tobacco use and the associated tobacco-related oral comorbidities among truck drivers in Chennai.

Methods

This cross-sectional study was conducted to assess the effectiveness of an oral cancer

screening program among truck drivers in Chennai city. This study was based on census methods, and all truck drivers who gave their consent during the study period (Jan 2022 to Oct 2022) were recruited and examined. A snowball method of sampling was followed, and the study objectives were explained before obtaining consent in their preferred language and examined at Gas stations on the outskirts of Chennai city. A local non-governmental organization (World Vision) coordinated the logistics for this program along with a dental college.

Ethical clearance to conduct the study was obtained from the Institutional Review Board, Ragas Dental College and consent was obtained from all the study participants who drove trucks for more than one year and have not been a part of any oral screening program within one year.

The dental screening team comprised five doctors (specialists in Public health dentistry and Oral and Maxillofacial Pathology) who were involved in the data collection and screening of the study participants. The team involved in this program received prior training in the screening modalities, data collection methods, and biopsy techniques under the supervision of the specific departments. In this program, the Interns were involved in obtaining consent from the participants and collecting data regarding their demography, tobacco use, alcohol use, and their perception regarding non-health oral ulcers and oral cancer.

The oral examination of the subjects was conducted by postgraduate students using the ADA Type III examination. In the presence of suspicious oral lesions, toluidine blue staining was used as a screening tool. Photographs for all the lesions were taken using a mobile phone with a minimum 10-megapixel camera and transferred to the authors (PDMK and KR) for opinions regarding management. After consensus and consent, a standard punch biopsy was taken from the subject by a faculty member, and the standard procedure was followed for the transportation of the samples and histological examination. Post-operative instructions and medications were provided for the participants for whom biopsies were performed. On average around 30 truck drivers were screened per day and for those requiring confirmation, biopsies were taken. The program was conducted once a fortnight during which the earlier obtained specimens were histologically processed and the findings were reported confidentially to the subject. All subjects who participated in the program received health education messages, with special emphasis on tobacco and alcohol habit cessation using cognitive behavioral therapy by trained professionals. For those subjects with oral potentially malignant or dysplastic histological changes, individual follow-up was done for them to seek professional care at their location of preference.

The data obtained were compiled in a Microsoft Windows Excel file and transferred to IBM SPSS Statistics version 26 for data analysis. Descriptive statistics was used to represent frequencies related to demography and tobacco use.

Results

The present study was conducted among truck drivers in Chennai to assess the prevalence of tobacco use and associated potentially malignant and malignant oral lesions amongst this population. Seven hundred and ninety-five truck drivers were approached for this screening program and 747 with a mean age of 39.8±1.51 years consented to participate. Among them, 704 (94.2%) were current users of various tobacco products, with 235 (31.4%) preferring smoking and the rest 469 (62.8%) using smokeless tobacco products. The latter used predominantly Gutka (54.8%), followed by Paan and Pan Masala [Table 1].

Table 1: Demographic characteristics and prevalence of tobacco use among the study population

Characteristics	**No** of subjects
Male	747 (100%)
Female	0
Mean age	39.8 ±1.51
Smoke tobacco users	235 (31.4%)
Smokeless tobacco users	469 (62.8%)
Non-tobacco users	43 (5.8%)
Types of Smokeless Tobacco users	
Gutkha	257 (54.8%)
Paan	116 (24.8%)
Pan Masala	64 (13.7%)
Khaini	21 (4.4%)
Mawa	11 (2.3%)

Oral mucosal lesions were recorded in 49 (6.5%) of the study population. All the oral mucosal lesions were present in truck drivers with tobacco use except for 5 participants (three with frictional keratosis and two with traumatic fibroma) who presented with no history of habits. Punch/incisional biopsies were taken among 17 of the 49 subjects and oral dysplasia was histopathologically confirmed in 9 (mild epithelial dysplasia = 5; moderate epithelial dysplasia = 4) subjects. Table 2 and Table 3 demonstrate the distribution of tobacco use patterns and the clinical and histological diagnosis of truck drivers with oral lesions.

Table 2: Distribution of Habits with tobacco use among truck drivers (N = 49)

S.No	Oral Lesions in Truck Drivers	Distribution of Habits with tobacco use among truck drivers (n = 49)				
		No Habits	Tobacco +Betel Nut	Tobacco +Paan	Tobacco Chewing	Tobacco Smoking
1	Leukoplakia	-	7	-	4	4
2	Erythroplakia	-	-	-	1	-
3	Erythroleukoplakia	-	-	1	-	-
4	Tobacco pouch keratosis	-	3	-	8	-
5	Smoker's palate	-	-	-	-	2
6	Smoker's melanosis	-	-	-	-	6
7	Frictional keratosis	3	-	-	-	1
8	Traumatic fibroma	2	-	-	-	2
9	Leukoedema	-	1	-	-	-
10	Candidiasis	1	-	-	-	1
11	Fordyce Granules	-	-	-	-	2

Table 3: Histopathological diagnosis of oral potentially malignant lesions among truck drivers

Histopathological Diagnosis (N=17)	Number of Cases
Mild Epithelial Dysplasia	5
Moderate Epithelial Dysplasia	4
Oral Epithelial Atypia	5
Hyperkeratosis, acanthosis, atrophy	3

Discussion

Truck drivers, when compared to other drivers (of bus, rail, delivery, etc) are a neglected subset among the Indian population in terms of risk coverage and health priorities. Literature has shown that this population sustains more injuries, fatalities and illness when compared to other populations. Australian truck drivers have been documented to have a higher health-related insurance claim rate of 70.3 per 1,000 workers.[9] However, no such data is available among the Indian truck drivers as they are under a private body and hence lack an exclusive health insurance package unlike their counterparts (bus, railways) who are under the government sector. An Indian truck driver travels long distances to cover this wide country and plays a vital role in the movement of goods from the producers to the consumers. Typically, because of traffic restrictions during the daytime, truck drivers drive all night on arterial highways of India and usually station themselves on the outskirts of the city, in places known as Dhabas (which offer boarding and lodging facilities) during the daytime. Almost all of them are away from their home and family and may only have an opportunity to meet them at less frequent intervals. This unhealthy lifestyle with a lack of adequate sleep and nutrition[10] identifies this vulnerable population as a risk group for various health challenges. In addition, this population has a high prevalence of substance abuse, including the use of tobacco and alcohol. Karthikeyan S et al,[11] studied the socio-demographic profile of 160 truck and tempo drivers and the prevalence of health problems among them. They reported higher use of tobacco (39% smoke tobacco, 34% used paan, 62% used Chuna, 77% used Gutka) and alcohol (65%) among this population. Many truck drivers think that tobacco is a stimulant and keeps them alert and awake while driving. Alcohol is favored as a substance of ecstasy and recreation to bond with their counterparts. The present study demonstrated that 85% of truck drivers used some of the tobacco products. It has been postulated that altered lifestyle and higher prevalence of tobacco and alcohol use have been associated with obesity, hypertension, and diabetes which in turn increases the likelihood of higher mortality rates among this population.[12]

Tobacco use is a major public health concern in India and its use has been associated with major non-communicable diseases, including oral cancer. It has been estimated that in the year 2011, India had spent close to INR 104,500 crores (US$ 22.4 billion) in private and public spending on tobacco-related illness, which was around 1.14% of its gross domestic product.[13] The Indian government has taken numerous steps to curb the menace caused by tobacco products and the results have also been promising. Compared to the Global Adult Tobacco Survey - 1 (GATS-1) (2009-10), GATS-2 demonstrated a six-point reduction in the overall prevalence of tobacco use and a 17% reduction in current tobacco use. The government envisions, through its National Health Policy to reduce the prevalence of tobacco use by 15% by 2020 and 25% by 2025. As a part of this program, tobacco cessation services are offered to identified risk populations and truck drivers are one such population who need prioritization for cessation services and health care delivery.

Targeted risk group cancer screening programs have always provided positive dividends and have played a vital role in the early identification of lesions. Oral cancer screening programs provide an opportunity to identify potentially

malignant lesions, which, with adequate medical attention and support could delay or prevent malignant transformation. The population-based screening program at Kannur, India had earlier demonstrated the advantages of this program among the Indian population as being cost-effective and able to diagnose cases at an early stage, which in turn had an impact on treatment and patient-survival outcomes.[14] D'Cruz et al conducted a targeted oral cancer screening program among truck drivers in Dhakshina Kannada, India among 964 subjects. Among the screened, 148 (15%) had red/white lesions of which 23 lesions were ulcerated and had indurated borders. Tissue biopsy was performed for these 23 (15.6%; 23/148) suspicious ulcerated lesions of which 2 were confirmed for oral squamous cell carcinoma and 21 (14%; 21/148) had dysplasia.[1] In a study conducted by Choudhury et al in April 2021 among bus drivers from Karnataka, India the prevalence of Leukoplakia and Oral Submucous Fibrosis were 44.92% and 37.68% respectively.[15] The present study was conducted among 747 truck drivers, among whom 49 (6.5%) had red/white lesions. Tissue biopsies were taken for 17 suspicious lesions of which 9 had dysplasia. The difference in the study results could be attributed to the difference in the population and the screening method used. The truck drivers included in this study were from diverse states of India and none were residents of the state from where the study was conducted. Further, our study used toluidine blue staining for screening of oral lesions and subsequently, biopsies were taken for those lesions that stained positive. The authors have demonstrated 88% sensitivity of this technique in an earlier study done among a rural population in Southern India.[16] The study conducted by D'Cruzet et al used exfoliative cytology using the oral rub and rinse technique, which had considerably lesser sensitivity values.[17] Despite these contrasting results, several Cochrane reviews[18] and Indian studies[19] have endorsed the advantages of opportunistic oral screening using visual and tactile examinations for high-risk tobacco and alcohol users for early case detection.

Conclusions

Truck drivers with tobacco and substance abuse are at high risk of developing oral cancer. Periodic oral cancer screening programs for this vulnerable population help to identify potentially malignant oral lesions at an early stage. Clinical and histopathological examination of suspicious oral potentially malignant disorders with appropriate follow-up of truck drivers prevent their progression to oral cancer.

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References

1. D'Cruz AM, Shetty P, Shetty UA. Targeted Screening Programme for Early Detection of Oral Malignant And Potentially Malignant Lesions Using The Oral Rub And Rinse Technique Among Truck Drivers in Dakshina Kannada District – A Cross-Sectional Study. J OrofacSci 2019;11(2):89-92. Available from: https://doi.org/10.4103/jofs.jofs_84_19
2. Okpataku CI. Pattern and reasons for substance use among long-distance commercial drivers in a Nigerian city. Indian J Public Health 2015;59(4):259-63. Available from: https://doi.org/10.4103/0019-557X.169649
3. Rose S, Wojcik J. The health habits and physical activity of student truck drivers. The WinthropMcNair Research Bulletin 2015;1:68-76. Available from: https://digitalcommons.winthrop.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1011&context=wmrb

4. Batson A, Berecki-Gisolf J, Newnam S, Stathakis V. Pre-injury health status of truck drivers with a workers' compensation claim. BMC Public Health. 2022 Sep 5;22:1683. Available from: https://doi.org/10.1186/s12889-022-13885-4
5. Warnakulasuriya S, Kujan O, Aguirre-Urizar JM, Bagan JV, González-Moles MÁ, Kerr AR, et al. Oral potentially malignant disorders: A consensus report from an international seminar on nomenclature and classification, convened by the WHO Collaborating Centre for Oral Cancer. Oral Dis. 2021 Nov;27(8):1862-80. Available from: https://doi.org/10.1111/odi.13704
6. Williams P M., Poh CF, Hovan, A J, Ng S, and Rosin MP. Evaluation of a Suspicious Oral Mucosal Lesion. J. Can. Dent Assoc. April 2008;74(3),275–80. Available from: https://pubmed.ncbi.nlm.nih.gov/18387268/
7. Farah CS, Woo SB, Zain RB, Sklavounou A, McCullough MJ, and Lingen M. Oral Cancer and Oral Potentially Malignant Disorders. Int. J. Dent. 2014;853479 Available from: https://doi.org/10.1155/2014/853479
8. Iocca O, Sollecito T P, Alawi F, Weinstein GS, Newman JG, Virgilio AD, et al. Potentially Malignant Disorders of the Oral Cavity and Oral Dysplasia: A Systematic Review and Meta-Analysis of Malignant Transformation Rate by Subtype. Head Neck. March 2020;42(3);539–55. Available from: https://doi.org/10.1002/hed.26006
9. Xia T, Iles R, Newnam S, Lubman DI, Collie A. Patterns of health service use following work-related injury and illness in Australian truck drivers: A latent class analysis. Am J Ind Med. Feb 2019;63(2):180-7. Available from: https://doi.org/10.1002/ajim.23072
10. Apostolopoulos Y, Sönmez S, Shattell M, Haldeman L, Strack R, Jones V. Barriers to truck drivers' healthy eating: Environmental infuences and health promotion strategies. J Work Behav Health. 2011;26(2):122–43. Available from: https://doi.org/10.1080/15555240.2011.573754
11. Karthikeyan S, Gurav R, Joshi SD, Wayal RW. Health and socio-demographic profile of transport workers. Indian J Occup Environ Med 2004;8(2):8-10. Available from: https://journals.lww.com/ijoe/abstract/2004/08020/health_and_socio_demographic_profile_of_transport.1.aspx
12. Birdsey J, Alterman T, Li J, Petersen MR, Sestito J. Mortality among members of a truck driver trade association. AAOHN J 2010;58(11):473-80. Available from: https://doi.org/10.3928/08910162-20101018-01
13. Sharma K, Junaid M, Diwakar MK. Economic implications of tobacco industry in India: An overview. Indian J Public Health 2017;61(2):131-3. Available from: https://doi.org/10.4103/ijph.IJPH_245_15
14. Philip PM, Nayak P, Philip S, Parambil NA, Duraisamy K, Balasubramanian S. Population-based cancer screening through community participation: Outcome of a district wide oral cancer screening program from rural Kannur, Kerala, India. South Asian J Cancer 2018;7(4):244-8. Available from: https://doi.org/10.4103/sajc.sajc_104_17
15. Choudhury AR, Ankola AV, Sankeshwari RM, Siddibhavi M, Vallakunja D, Khot AP, et al. Assessment of oral health status and tobacco-related habits among the employees of North-West Karnataka Road Transport Corporation (NWKRTC), Belagavi City - A Cross-Sectional Study. International Journal of Occupational Safety and Health 2022; 12(4), 299–306. Available from: https://doi.org/10.3126/ijosh.v12i4.43885
16. Madankumar PD, Iyer K, Soni S, Nagarajan L, Kumar K, Solomon S, et al. A simple screening program for oral cancer in a defined geographic area in southern India: A community-based cross-sectional study. Cancer Res Stat Treat 2022;5(2):226-31. Available from: https://doi.org/10.4103/crst.crst_92_22
17. DinizFreitas M, GarcíaGarcía A, Crespo Abelleira A, Martins Carneiro JL, Gándara Rey JM. Applications of exfoliative cytology in the diagnosis of oral cancer. Med Oral. 2004; 9(4):355-61. Available from: https://pubmed.ncbi.nlm.nih.gov/15292877/
18. Brocklehurst P, Kujan O, Glenny AM, Oliver R, Sloan P, Ogden G *et al.* Screening programmes for the early detection and prevention of oral cancer. Cochrane Database SystRev. 2013;CD004150(11). Available from: https://doi.org/10.1002/14651858.CD004150.pub4
19. 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. Available from: https://doi.org/10.1016/S0140-6736(05)66658-5