

Denture Wearing During Sleep Doubles The Risk Of Pneumonia In The Very Elderly

Research Article

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Abstract

Poor oral health and hygiene are increasingly recognized as major risk factors for pneumonia among the elderly. To identify modifiable oral health-related risk factors, we prospectively investigated associations between a constellation of oral health behaviors and incident pneumonia in the community-living very elderly. Those who wore dentures during sleep were more likely to have tongue and denture plaque, gum inflammation, positive culture for candida albicans higher levels of circulating interleukin-6 as compared with their counterparts. This study provided empirical evidence that denture wearing during sleep is associated not only with oral inflammatory and microbial burden but also with incident pneumonia, suggesting potential implications of oral hygiene programs for pneumonia prevention in the community. The aim of the study is to study if denture wearing during sleep doubles the risk of pneumonia in the very elderly. The objective of this study is to assess the knowledge about the denture wearing during sleep doubles the risk of pneumonia in the very elderly. A set of questionnaires was developed in relation to the knowledge about the denture wearing during sleep and was circulated. A total response of 100 was developed. The data collected was compiled for analysis of the result. This study concludes that the elderly people are not much aware that the denture wearing during sleep doubles the risk of pneumonia. Much more awareness is needed among the elderly people in the denture wearing during sleep which doubles the risk of pneumonia.

Keywords: Denture Wearers; Sleep; Pneumonia; Oral Hygiene; Very Old; Interleukin -6.

Introduction

Pneumonia is a major morbidity and mortality risk among the elderly [1]. The 2010 Global Burden of Disease Study reported that lower respiratory tract infections, including pneumonia, are the fourth leading cause of death globally, and the second most frequent reason for years of life lost [3]. In Japan, pneumonia has ranked as the third leading cause of death since 2011, and the second leading cause of death among nonagenarians (Ministry of Health, Labour and Welfare 2012). Aspiration is an important pathogenic mechanism for pneumonia in the elderly, and poor oral health is increasingly recognized as a predisposing factor [8]. Indeed, randomized interventional trials demonstrated that pro-

fessional oral care reduces the burden of pneumonia among the frail elderly in long-term care facilities [5]. It remains unknown, however, whether improving oral hygiene by altering behaviors could reduce the risk of pneumonia in community settings. With a rapid demographic shift toward the very elderly in the population and a concomitant increase in the global burden of poor oral condition [9], the development of a motivational and self-manageable oral health promotion program for pneumonia prevention is a matter of public health priority [20]. To identify behavioral risk factors, modification of which could provide tangible benefits for pneumonia prevention, we prospectively investigated associations between a constellation of oral health behaviors and pneumonia events in the community-living very elderly.

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Denture wearing during sleep is associated not only with oral inflammation and microbial burden but also with pneumonia, showed the study, suggesting potential implications of oral hygiene programmes for pneumonia prevention in the community [13]. The researchers also found that those who wore dentures while sleeping were more likely to have tongue and denture plaque, gum inflammation, positive culture for *Candida albicans* and higher levels of circulating interleukin-6 [12]. "These findings lead to a simple and straightforward clinical recommendation - denture wearing during the night should be discouraged in geriatric patients," commented Frauke Mueller from the University of Geneva, Switzerland. Elucidating the biological mechanisms by which denture wearing during sleep raises the risk of serious pneumonia is likely to provide rational information to design effective and convincing oral health programs for the very elderly, who have an increased need for removable prostheses and show loss of immune competence [24]. First, even in a healthy older adult, aspiration of unnoticed oropharyngeal and periodontal secretions occurs during sleep, and a high incidence of silent aspiration is strongly related to pneumonia among the elderly [14], particularly those with dementia or cerebrovascular disease. Denture wearing during sleep was reported to be associated with poor denture hygiene, oral candidiasis [15], and denture stomatitis, all of which may function as reservoirs of potentially infectious pathogens [22]. Our findings that denture wearers during sleep had significantly higher rates of denture and tongue plaque and oral candidiasis provide additional evidence for this suggestion [25]. The secretion and function of saliva might have substantial influences on the relationship between denture wearing during sleep and candida infection [19]. Previous studies speculated that nocturnal denture wearing decreases the protective effects of saliva against candida spp. Although candida spp. Infrequently caused pneumonia, they are an important risk factor for denture stomatitis which is characterized as inflammation and erythema of the oral mucosa and its predisposal to bacterial pathogens [30]. Therefore, the protective effect of saliva is an important factor of denture stomatitis as well as aspiration pneumonia, and it would be wise to look into patients' nocturnal denture-wearing habits and relations with oral immunity, or their salivary defense proteins such as immunoglobulin A. Second, denture wearing during sleep may be an indicator of overall poor oral hygiene practices [18]. In the present study, denture wearers during sleep were characterized by lower frequencies of dental visits and denture cleaning [7], and extremely limited usage of denture cleansers compared to their counterparts. In this scenario, it remains unclear whether the physical removal of dentures during sleep is sufficiently efficient to reduce the risk of pneumonia [6], or if assiduous hygiene practices have preventive effects. Because of the observational nature of this study, we did not address this issue [28]. Recently, a randomized clinical trial of institutionalized subjects demonstrated

that overnight storage of dentures with alkaline peroxide-based tablets significantly decreased denture biofilm and the amount of candida albicans to a greater extent than dry or water preservation [21]. There is a great deal of evidence supporting the effect of biofilm removal using a denture cleanser; however, few studies have reported its practical usage, such as the dipping time [17]. Future prospective and interventional studies are warranted to examine whether appropriate use of cleansers or other methods (e.g., microwave cleaning) in combination with overnight denture removal could further reduce the risk of pneumonia in the elderly [10].

Materials and Methods

A questionnaire survey was conducted among the elderly patients. A set of 15 questions was developed. All the questions were based on the knowledge of denture wearing during sleep. The collected responses of 100 were analysed through SPSS software. All the collected data were then analyzed and bar graphs and pie charts were plotted with the extracted data.

Result And Discussion

It is important to prevent dental diseases, such as dental caries and periodontal disease, to prevent the loss of teeth. The most basic element to prevent dental disease is self care oral cleaning. It is thought that oral hygiene has a greater effect if correct instruction is provided by dental health experts [2]. In addition, because it is difficult to self assess oral health status correctly, regular checks by dental health experts are necessary to maintain oral health.

The response to the question oral health check up, 49.04% of the surveyed population undergoes regular oral health check up (Figure 1). A survey on regular oral health check up, pubmed 62% undergo regular oral health check up - similar to present study [22]. In response to the question alcohol consumption, 47.12% of the surveyed population are alcohol consumers (Figure 2). Alcohol consumption impairs neutrophil, macrophage, and T-cell functions, increasing the likelihood of infections. An article depicts that Evaluation and knowledge about alcohol consumption among the elderly 16% of the patients consume alcohol - similar to the present study [11]. The response to the question persistent cough, 32.69% of the surveyed population has persistent cough (Figure 3). A study depicts that a survey of the elderly patients who wear dentures 38% of the patients had persistent coughs considered relevant to the study [16]. The response to the question difficulty in swallowing, 44.23% of the surveyed population has difficulty in swallowing (Figure 4). An article says that a survey on the denture wearing of the elderly patients pubmed 12.4% have difficulty in swallowing is considered relevant to

Figure 1. Depicts that 49.04% of the surveyed population undergoes regular oral health check up.

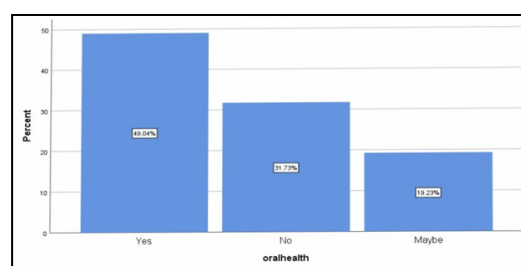


Figure 2. Depicts that 47.12% of the surveyed population are alcohol consumers which is not advisable for the denture wearers.

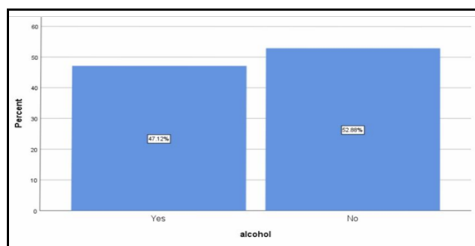


Figure 3. Depicts that 32.69% of the surveyed population has persistent cough.

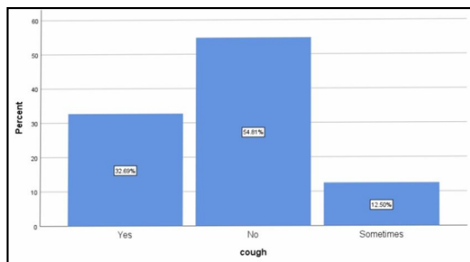


Figure 4. Depicts that 44.23% of the surveyed population have difficulty in swallowing.

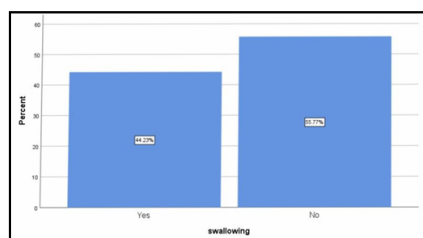


Figure 5. Depicts that 50.96% of the surveyed population has gum inflammation.

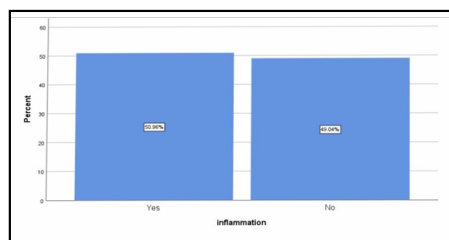


Figure 6. Depicts that 28.85% of the surveyed population clean their dentures 3 times a day.

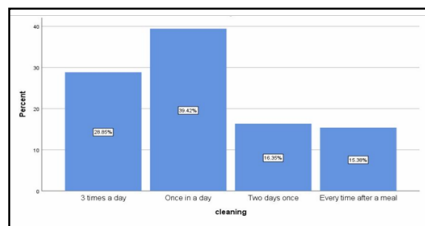
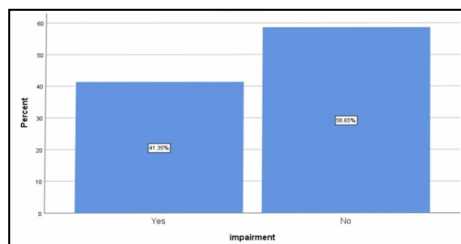


Figure 7. Depicts that 41.35% of the surveyed population has cognitive impairment.



the study [4]. The response to the question gum inflammation, 50.96% of the surveyed population has gum inflammation (Figure 5). An article says that a critical review of pubmed 48% of the elderly people who wear their dentures with gum inflamma-

tion is considered relevant to the study but further advancement proved to be eligible [31]. The response to the question denture cleaning, 28.85% of the surveyed population clean their dentures three times a day (Figure 6). An article says that denture cleaning

Figure 8. Depicts that 46.15% of the surveyed population has difficulty in breathing.

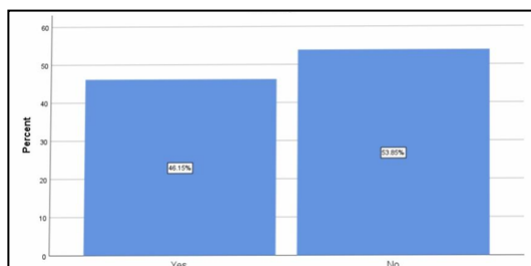
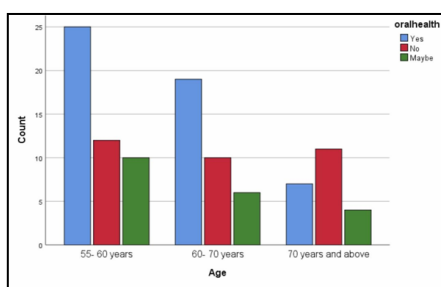
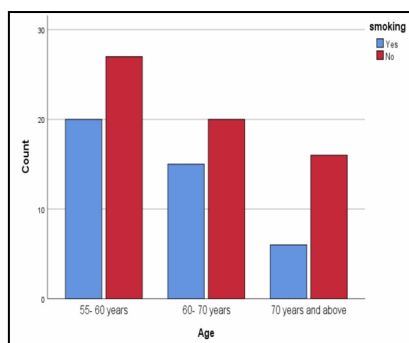


Figure 9. Bar chart representing the association between age and oral health among the elderly patients wearing dentures. Chi square analysis was done and the P value is 0.300 and is statistically insignificant.



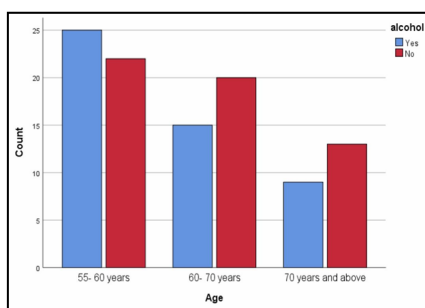
X axis represents the age of the patients and the Y axis represents the oral health check up. In the 55-60 year group of the denture wearing patient 25% says yes (blue), 12% says no (red), 10% says may be (green). In age group of 65-70 years 19% says yes (blue), 10% says no (red), 6% says may be (green). In the age group of above 70 years 7% says yes (blue), 11% says no (red), 4% says may be (green).

Figure 10. Bar chart representing the association between age and smoking habit among the elderly patients wearing dentures. Chi square test was done and the P value is 0.422 and is statistically insignificant.



X axis represents the age of the patients and the Y axis represents smoking habit. In the 55-60 age group of the denture wearing patient 20% says yes (blue), 27% says no (red). In age group of 65-70 years 15% says yes (blue), 20% says no (red). In the age group of above 70 years 6% says yes (blue), 16% says no (red).

Figure 11. Bar chart representing the association between age and alcohol consumption among the elderly patients wearing dentures. Chi square test was done and the P value is 0.524 and is statistically insignificant.



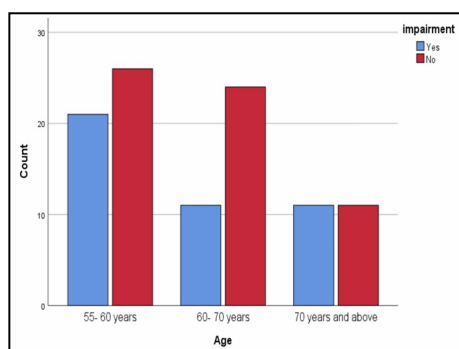
X axis represents the age of the patients and the Y axis represents alcohol consumption. In the 55-60 age group of the denture wearing patient 25% says yes (blue), 22% says no (red). In age group of 65-70 years 15% says yes (blue), 20% says no (red). In the age group of above 70 years 9% says yes (blue), 13% says no (red).

by the elderly patients pubmed - 27.6% of the denture cleaning is considered relevant to the study [26]. The response to the question cognitive impairment, 41.35% of the surveyed population has cognitive impairment (Figure 7). An article says that cognitive impairment of the elderly people pubmed - 90% of the people are not aware about the denture wearing during sleep - considered relevant to the study [27]. The response to the question difficulty

in breathing, 46.15% of the population has difficulty in breathing (Figure 8). An article says that 38.1% of the elderly patients who wear their dentures during sleep have difficulties in breathing is considered relevant to the study [29].

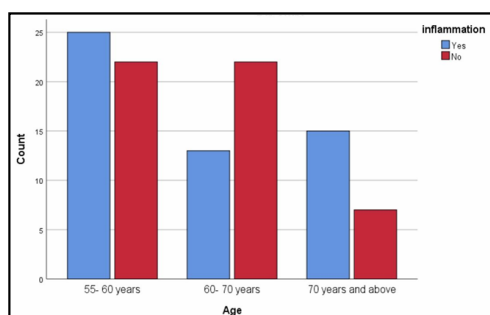
Conclusion

Figure 12. Bar chart representing the association between age and cognitive impairment among the elderly patients wearing dentures. Chi square test was done and the P value is 0.314 and is statistically insignificant.



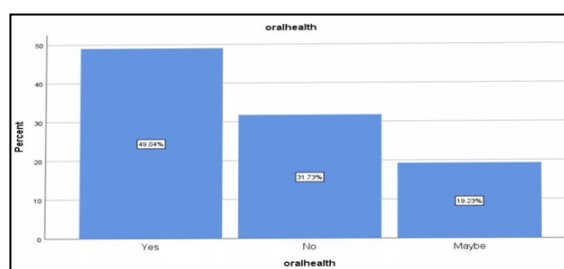
X axis represents the age and the Y axis represents cognitive impairment. In the 55-60 age group of the denture wearing patient 21% says yes(blue) , 26% says no(red) .In age group of 65-70 years 11% says yes(blue), 24% says no(red).In the age group of above 70 years 11% says yes(blue), 11% says no(red).

Figure 13. Bar chart representing the association between age and gum inflammation among the elderly patients wearing dentures. Chi square test was done and the P value is 0.068 and is statistically insignificant.



X axis represents the age and the Y axis represents gum inflammation. In the 55-60 age group of the denture wearing patient 25% says yes(blue) , 22% says no(red) .In age group of 65-70 years 13% says yes(blue), 22% says no(red).In the age group of above 70 years 15% says yes(blue), 7% says no(red).

Graph 1. This graph depicts that 49.04% of the surveyed population undergoes regular oral health check up.



In conclusion, the present study provided empirical evidence that denture wearing during sleep is associated not only with oral inflammatory and microbial burden but also with incident pneumonia, a potentially life-threatening condition in the very elderly. These results suggest that simple denture care habits could reduce the risk of pneumonia in the community. To meet the widespread need for dental prostheses among the very elderly in both developed and developing countries, evidence-based guidelines as well as oral health promotion programs with appropriate denture care should be urgently disseminated to dental professionals, primary care providers, and community services.

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