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Research Article

Factors Associated with the Edentulousness of Patients Coming for Consultation to the Dental Services in the City of Mahajanga Madagascar

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Abstract

Objective: The aim of this study was to determine the factors associated with the edentulousness of patients coming for consultation to the dental services in the city of Mahajanga Madagascar.

Methodology: It was a case-control study. The cases were constituted by the individuals who came to the dental service for consultation with partial or total edentulousness, with or without dental prostheses while the controls were constituted by individuals who came to the dental service for consultation without missing teeth. The sample size was 210, including 105 cases and 105 controls (1 case for 1 control). The Odds Ratio (OR) was used to determine if the studied variables are factors associated with edentulousness and the 95% Confidence Interval (CI95%) was used to identify if the association between edentulousness and studied variables was statistically significant.

Results: Age (OR=3.2 and CI95%=1.3–7.5), toxic habits (OR=9.8 and CI95%=4.3-22.2), environment factor (source of drinking water with OR=0.1 and CI95%=0.02-0.4) and factor related to the oral hygiene (materials and products used for oral hygiene and frequency of oral hygiene) are associated with edentulousness.

Suggestions: According to the results, sensitization of the population on the harmful consequences of edentulousness and on earlier consultation to the dentists when there are oral problems were suggested.

Keywords: Associated factors; Case-control study; Edentulousness

Introduction

Edentulousness constitutes a real physical, psychic and social handicap for the patient because its consequences affect not only the orofacial sphere but also on the well-being of the person [1]. Epidemiological data have shown that 2.3% of the world's population were edentulous in 2010 [2]. In Switzerland, a study conducted in 2009 showed that Socio-Economic Status strongly influenced dental floss [3].

And in Madagascar, statistics on tooth loss are still lacking. On the other hand, the prevalence of common dental diseases (tooth decay and periodontal disease) that can lead to edentulousness rose from 74.7% in 2001 to 98% in 2016 [4]. In the city of Mahajanga, dental extractions, reflecting edentulousness, still remain the first therapeutic act carried out in dental practices. Thus, in front of these epidemiological data, this study was carried out in order to

determine the factors associated with the edentulousness of the patients coming for consultation to the dental services in the city of Mahajanga.

Methodology

This is a case-control study on 210 patients who came for consultation to the dental services in the city of Mahajanga. The samples, including 105 cases (patients who were aged 18 years old and over, with partial or total edentulousness, with or without dental prostheses) and 105 controls (patients who were aged 18 years old and over, without missing teeth).

The following variables were studied in both cases and controls: age, toxic habits (consumption of alcohol or tobacco or both), economic factor (possession of savings to cover medical expenses), environmental factor (source of drinking water) and the factors that are related to the oral hygiene (materials and products used for oral hygiene, frequency of oral hygiene). Data collection was done from an individual interview and clinical observation and then the collected data was analyzed using IBM SPSS 20.0 software. The Odds Ratio (OR) was used to determine if the studied variables are factors associated with edentulousness and the 95% Confidence Interval (CI95%) was used to identify if the association between edentulousness and studied variables was statistically significant.

Results

Table 1: Distribution of cases and controls according to the age.

Age	Case		Control		OR	CI95%
	N	%	N	%		
Under 50 years old	22	20.9	8	7.6	3.2	1.3-7.5
50 years old and over	83	79,1	97	92.4		
Total	105	100	105	100		

N: number %: percent OR: odds ratio $CI_{95\%}$: confidence interval in 95%

Mean age Case: 42.4±12.3 years old Control: 33.2±9.8 years old

According to the age, 20.9% of the cases and 7.8% of the controls were under 50 years old, and 79.1% of the cases and 92.4% of the controls were over 50 years old. With an OR=3.2 and a CI95%=1.3-7.5. Age was associated with edentulousness.

Table 2: Distribution of cases and controls according to the toxic habit.

Toxic habit	Case		Control		OR	CI95%
	N	%	N	%		
Yes	97	92.4	58	55.2	9.8	4.3-22.2
No	8	7.6	47	44.8		
Total	105	100	105	100		

Toxic habit: consumption of tobacco or alcohol or both.

Regarding to the toxic habit, 92.4% of cases and 55.2% of controls had toxic habits (consumption of tobacco or alcohol or both) with OR=9.8 and CI95%=4.3-22.2, it constituted a risk factor of edentulousness.

Table 3: Distribution of cases and controls according to the source of drinking water.

Source of drinking water	Case		Control		OR	$CI_{95\%}$
	N	%	N	%		
JIRAMA (Treated water)	88	83.8	103	98.1	0.1	0.02-0.4
Well	17	26.2	2	1.9		
Total	105	100	105	100		

JIRAMA: Jiro sy Rano Malagasy (national company that distributes treated water).

Regarding to the source of drinking water, 83.8% of cases and 98.1% of controls consumed treated water from JIRAMA, while 26.2% of cases and only 1.9% of controls used well water as a source of drinking water, thus, the water treated by JIRAMA constituted a protective factor against edentulousness with OR=0.1 and a CI95%=0.02-0.4.

Table 4: Distribution of cases and controls according to the possession of savings to cover medical expenses.

Possession of savings to cover medical expenses	Case		Control		OR	$CI_{95\%}$
	N	%	N	%		
Yes	15	14.3	16	15.2	0.9	0.4-1.9
No	90	85.7	89	84.8		
Total	105	100	105	100		

Distribution of cases and controls according to the possession of savings to cover medical expenses told that 14.3% of the case and 15.2% of the control had saving to cover medical expenses. Having savings to cover medical expenses was not associated with edentulousness (OR=0.92 with 95% CI=0.43-1.99).

Table 5: Distribution of cases and controls according to the materials and products used for oral hygiene.

Materials and products used for oral hygiene	Case		Control		OR	$CI_{95\%}$
	N	%	N	%		
Toothbrush+toothpaste	90	85.7	102	97.2	0.1	0.5-0.6
Toothbrush+water	10	9.5	2	1.9	5.4	1.1-25.4
Finger+water	5	4.8	1	0.9	8.6	1.1-69.8
Total	105	100	105	100		

According to the materials and products used for dental hygiene, the use of toothbrush with toothpaste was a protective factor against edentulousness (OR=0.1, CI95%=0.5-0.6). The use of a toothbrush with only the water or the use of a finger and water constituted a risk factors of edentulousness with the following respective OR and CI95%: OR=5.4 with a CI95%=1.1-25.4 and OR=8.6 with a CI95%=1.1-69.8.

Table 6: Distribution of cases and controls according to the frequency of oral hygiene.

Frequency of oral hygiene	Case		Control		OR	$CI_{95\%}$
	N	%	N	%		
Once a day	21	20	8	7.6	3	1.3-7.2
Twice a day	54	51.4	26	24.8	3.2	1.8-5.8
Three times a day	30	28.6	71	67.6	0.2	0.1-0.3
Total	105	100	105	100		

Frequency of oral hygiene has been associated with edentulousness. Indeed, the frequency of oral hygiene once a day and twice a day constituted a risk factors of edentulousness (OR=3 with a CI95%=1.3-7.2 for the frequency once a day and OR=3.21 with a CI95%=1.79-5.78 for the frequency twice a day) Thus, the frequency of oral hygiene at three times a day represented a protective factor of edentulousness (OR=0.2, CI95%=0.1-0.3).

Discussion

Age

According to the age, the mean age of the cases was 42.4±12.3 years old, while that of the controls was 33.2±9.8 years old. Age was associated with edentulousness. This result confirms the result of Hüe who found the direct relationship between age and the number of missing teeth. Indeed, the number of missing teeth increases with age [5]. Dupuis also confirmed this by saying that patients who are increasingly older, become more and more edentulous [6].

Toxic habit

Regarding to the toxic habit, it was a risk factor of edentulousness (OR=9.8 and CI95%=4.3-22.2). Toxic habits are composed by tobacco consumption, alcohol consumption or both. Azogui and Rochereau found that the probability of reporting missing teeth or poor oral health increased with tobacco consumption [7]. In addition, longitudinal studies have shown that smokers were two to three times more likely to develop periodontal disease, leading to tooth loss, compared to non-smokers [8].

Environmental factor

It was observed that the source of drinking water was a factor associated with edentulousness. The water from the JIRAMA was a protective factor against edentulousness. JIRAMA is a national company that exploits and uses the hydraulic resources as a raw material in the distribution of water, it uses the water potability standard in Madagascar as a reference. In addition, natural water resources are often contaminated, so, they need treatment.

Economic factor

Possession of savings to cover medical expenses was not associated with edentulousness (OR=0.9 with CI95%=0.4-1.9). However, a study conducted in Switzerland showed that the absence of health insurance is partly responsible for the worsening of the dental status of those who lived near the poverty line; and the possession of health insurance positively influences the early use of dental services [3]. But saving to cover medical expenses can be replaced by the inclusion of patients in a dental insurance program leading to improved access to care and a decrease in medical prescriptions induced by deprivation of care [3].

Factors related to oral hygiene

Regarding the materials and products used for dental hygiene, the use of toothbrushes with toothpaste was a protective factor against edentulousness (OR=0.1, CI95%=0.5-0.6). And the frequency of oral hygiene was also associated with edentulousness. Indeed, the frequency of hygiene once a day and twice a day constituted risk factors for edentulousness, Thus, the frequency of three times a day represented a protective factor for edentulousness (OR=0,2 and CI95%=0.1-0.3). Many studies have noted the effectiveness of twice or three times daily brushing with fluoridated toothpaste as an oral hygiene measure [9, 10]. More than half (51%) of toothless Belgians brush their teeth less than twice a day [11].

Conclusion

This study tried to determine the factors associated with edentulousness.

It has been verified that the risk factors for edentulousness were: age, tobacco and alcohol consumption, the use of toothbrushes with water or fingers with water as materials and products used for oral hygiene and the frequency of oral cleaning less than or equal to twice a day.

On the other hand, the water driking from JIRAMA, the possession of saving to cover medical expenses, the use of toothbrushes with toothpaste, a frequency of oral cleaning three times a day constituted protective factors against edentulousness.

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Conflict of Interest

No conflict of interest.

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