EPIDEMIOLOGICAL PROFILE OF EDENTULISM AND ORAL REHABILITATIONS WITH DENTAL IMPLANTS IN A BRAZILIAN ADULT SUBPOPULATION

Norton Rhenis Mourão Lindhon [1]
Helder Fernandes Oliveira [2]
Orlando Aguirre Guedes [3]

ABSTRACT

The epidemiological aspects of edentulism and rehabilitation with dental implants were evaluated in an adult population from Central Brazil. Panoramic radiographs were analyzed, and data regarding sex, age at the time of examination, number of missing teeth, and number and location of dental implants were collected. Statistical significance was determined using the Chi-square test. The study involved 672 female patients (59.5%) and 457 male patients (40.5%), aged between 22 and 80 years (mean = 47.7 years). A total of 67.5% (n = 762) of the sample was partially edentulous, 30.5% (n = 344) was dentate, and 2.0% (n = 23) was completely edentulous. A total of 6,202 teeth were missing, of which 3,461 (55.8%) were maxillary teeth and 4,709 (76%) were posterior teeth. The most frequently missing tooth was the lower right first molar (n = 549; 8.85%). Statistical differences between the type of missing tooth and sex were recorded only for teeth 17 (P = 0.030), 26 (P = 0.014), and 37 (P = 0.012). A total of 188 patients (16.7%) had oral rehabilitations with dental implants, totaling 664 installed implants. Of these, 268 (40.4%) implants were located in the posterior region of the mandible, while 176 (26.5%) were located in the posterior region of the maxilla. The adult population of Central Brazil presents a high number of missing teeth and a reduced number of rehabilitations involving the placement of dental implants.

Keywords: Edentulism; tooth loss; dental implants; panoramic radiography.

INTRODUCTION

Edentulism is a term used to describe the partial or total loss of natural teeth (Nico et al., 2016). Tooth loss is associated with several factors, such as dental caries, periodontal disease, maxillofacial trauma, and dental pathologies (SB Brasil 2010, 2012).

Edentulism should be considered a major public health problem due to its high prevalence (Silva et al., 2015), especially in areas of high social deprivation (Guedes, 2009). Its impact on the quality of life of young and older adults is evident, due to physical, biological, and emotional discomfort, including difficulties in mastication, phonation, imbalance of facial musculature, as well as aesthetic impairment (Marcenes et al., 1999; Côrtes et al., 2001).

[1] Discente do Curso de Odontologia, Universidade Evangélica de Goiás - UniEVANGÉLICA, E-mail: norton_rhenis@hotmail.com
[2] Coorientador, Docente Doutor do Programa de Pós-Graduação em Odontologia da Universidade Evangélica de Goiás - UniEVANGÉLICA, E-mail: helfo22@gmail.com
[3] Orientador, Docente Doutor do Programa de Pós-Graduação em Odontologia da Universidade Evangélica de Goiás - UniEVANGÉLICA, E-mail: orlandoaguedes@gmail.com

Longitudinal studies have verified the feasibility of implant-supported prostheses as a rehabilitative treatment (Kern, 2012; Passia & Kern, 2014). Implant dentistry, associated with fixed implant-supported prostheses, has proven superior in functional, aesthetic, and psychological aspects when compared to tooth-supported prosthetic rehabilitation (Ortega-Lopes et al., 2011). However, the possibilities of complications or contraindications associated with oral rehabilitation with dental implants must be considered (Crosara et al., 2012).

This study aimed to determine the prevalence of edentulism and to evaluate the distribution and location of oral rehabilitations with dental implants through panoramic radiographs of a Brazilian adult subpopulation.

MATERIAL AND METHOD

The study was conducted from a retrospective analysis of 2,314 digital panoramic radiographs from a secondary database of a private radiology clinic located in Goiânia, GO (Odonto Nery Diagnóstico por Imagem Ltda., Goiânia, GO, Brazil).

Inclusion criteria were panoramic radiographs of patients over 18 years old, of good quality, and without artifacts. Exclusion criteria included radiographs of patients with deciduous or mixed dentition and patients whose radiographic reports were unavailable.

Information was collected from each patient's records and radiographic examination: sex, age at the time of examination, number of missing teeth, type of missing tooth, number of installed dental implants, and anatomical location of the dental implant (mandible or maxilla; anterior or posterior region). Regarding the number of missing teeth, participants were classified into three categories (Dias et al., 2019): dentate (patients with 28 teeth), partially edentulous (patients with 1 to 27 missing teeth, disregarding cases with absence of only third molars or unerupted teeth), and totally edentulous (patients with no teeth in either arch).

All digital panoramic images were obtained using a direct digital system of the Cranex® D equipment (Orion Corp., Soredex, Helsinki, Finland). The images were analyzed using the software provided with the panoramic X-ray machine (Digora® for Windows 2.7, Orion Corp., Soredex, Helsinki, Finland).

All data were entered into Microsoft Excel 2010 (Microsoft, Redmond, WA, USA). Statistical analysis was performed with IBM® SPSS version 20.0 (IBM Corporation, Armonk, NY, USA). Chi-square and Pearson's correlation tests were used for categorical variables. Normality of data distribution was assessed with the Levene test. Mann-Whitney and t-tests were used to compare numerical variables. A statistical significance level of 5% was adopted for all analyses.

RESULTS

From a total of 2,314 radiographs, 1,185 were excluded for not meeting the inclusion criteria. A final sample of 1,129 radiographs was included in the present study. The analysis comprised 672 female patients (59.5%) and 457 male patients (40.5%) (female-to-male ratio of 1.47:1), aged between 22 and 80 years (mean = 47.7 years; standard deviation = 11.6 years).

Regarding the number of teeth, 67.5% (n = 762) of the participants were partially edentulous, 30.5% (n = 344) were dentate, and 2.0% (n = 23) were completely edentulous. The prevalence of total edentulism was higher among females (61%). However, no statistically significant difference was observed between the number of missing teeth and sex (P = 0.164).

However, no statistically significant difference was observed between the number of missing teeth and sex (P = 0.164) (Table 1). A greater absence of these teeth was observed among males.

Statistically significant differences between the type of missing tooth and sex were observed only for teeth 17 (P = 0.030), 26 (P = 0.014), and 37 (P = 0.012) (Table 3).

No statistically significant differences were observed between the number of implants placed by region and sex (Table 3).

Tabela 1: Distribuição da amostra do estudo em função do gênero e número de dentes ausentes.

Gênero	Número de dentes ausentes			Total n (%)	Valor de P*
	Dentado n (%)	Desdentado Parcial n (%)	Desdentado Total n (%)		
Feminino	219 (19,4)	439 (38,9)	14 (1,2)	672 (59,5)	0,164
Masculino	125 (11,1)	323 (28,6)	9 (0,8)	457 (40,5)	
Total	344 (30,5)	762 (67,5)	23 (2,0)	1129 (100)	

*Teste Qui-Quadrado

Fonte: Próprio autor

Table 2: Distribuição da condição dentária em função do gênero.

Dente	Gênero				Valor de P*
	Feminino		Masculino		
	Presença (%)	Ausência(%)	Presença (%)	Ausência(%)	
11	557 (82,9)	115 (17,1)	366 (80,1)	91 (19,9)	0,240
12	543 (80,8)	129 (19,2)	362 (79,2)	95 (20,8)	0,543
13	585 (87,1)	87 (12,9)	394 (86,2)	150 (13,8)	0,721
14	502 (74,7)	170 (25,3)	340 (74,4)	117 (25,6)	0,945
15	482 (71,7)	190 (28,3)	333 (72,9)	124 (27,1)	0,685
16	514 (76,5)	158 (23,5)	326 (71,3)	131 (28,7)	0,052
17	547 (81,4)	125 (18,6)	347 (75,9)	110 (24,1)	0,030
21	546 (81,3)	126 (18,8)	365 (79,9)	92 (20,1)	0,591
22	549 (81,7)	123 (18,3)	363 (79,4)	94 (20,6)	0,356
23	585 (87,1)	87 (12,9)	390 (85,3)	67 (14,7)	0,427
24	513 (76,3)	159 (23,7)	327 (71,6)	130 (28,4)	0,071
25	485 (72,2)	187 (27,8)	324 (70,9)	133 (29,1)	0,638
26	494 (73,5)	178 (26,5)	304 (66,5)	153 (33,5)	0,014
27	543 (80,8)	129 (19,2)	359 (78,6)	98 (21,4)	0,365
31	643 (95,7)	29 (4,3)	429 (93,9)	28 (6,1)	0,212
32	641 (95,4)	31 (4,6)	431 (94,3)	26 (5,7)	0,489
33	644 (95,8)	28 (4,2)	435 (95,2)	22 (4,8)	0,659
34	584 (87,0)	87 (13,0)	408 (89,3)	49 (10,7)	0,265
35	541 (80,5)	131 (19,5)	361 (79,0)	96 (20,1)	0,546
36	380 (56,5)	292 (43,5)	245 (53,6)	212 (46,4)	0,360
37	486 (72,3)	186 (27,7)	298 (65,2)	159 (34,8)	0,012
41	643 (95,8)	28 (4,2)	428 (93,7)	29 (6,3)	0,127
42	643 (95,7)	29 (4,3)	426 (93,2)	31 (6,8)	0,079
43	643 (95,7)	29 (4,3)	443 (96,9)	14 (3,1)	0,343
44	595 (88,5)	77 (11,5)	414 (90,6)	43 (9,4)	0,281
45	540 (80,4)	132 (19,6)	365 (79,9)	92 (20,1)	0,879
46	380 (56,5)	292 (43,5)	246 (53,8)	211 (46,2)	0,393
47	471 (70,1)	201 (29,9)	300 (65,6)	157 (34,4)	0,118

*Teste Qui-Quadrado

Fonte: Próprio autor

Tabela 3: Localização anatômica dos implantes dentários de acordo com o sexo.

	Localização do implante			
	Maxila		Mandíbula	
Sexo	Anterior	Posterior	Anterior	Posterior
Masculino	64	51	16	85
Feminino	27	27	9	35
Valor de p*	0,059	0,567	0,934	0,606

*Mann-Whitney.

Fonte: Próprio autor

CONCLUSION

The adult population of Central Brazil presents a high number of missing teeth and a low rate of rehabilitations involving the placement of dental implants.

REFERENCE

1. CROSARA, M.B., ALENCAR, A.H.G, SOUZA, J.B., ROCHA, S.S., SILVA, J.A., ESTRELA, C. Prevalence of pillar teeth for conventional fixed prostheses in a Brazilian subpopulation. Stomatos. 34(18):60-70, 2012.

2. GUEDES, A.O. Análise Epidemiológica dos Traumatismos Dentários em Dentição Permanente em Goiânia. (dissertação). Uberlândia: Universidade Federal de Uberlândia/FO; 2009.

3. KERN M. Single implant in the middle of the mandible: an update. Implantol. 20(1):23–30, 2012.

4. MARCENES, W., AL BEIRUTI, N., TAYFOUR, D., ISSA, S. Epidemiology of traumatic injuries to the permanent incisors of 9-12-year-old schoolchildren in Damascus, Syria. Dental Traumatol. 15(3):117-23, 1999.

5. NICO, L. S. et al. Saúde Bucal autorreferida da população adulta brasileira: resultados da Pesuisa Nacional de Saúde 2013. Ciência & Saúde Coletiva, v. 21, p. 389-398, 2016.

6. ORTEGA-LOPES, R., NÓIA, C.F., ANDRADE, V.C., CIDADE, C.P.V., MAZZONETO, R. Perfil dos pacientes tratados com implantes dentários: análise retrospectiva de sete anos. Rev Port Estomatol Med Dent Cir Maxilofac. 52(3):147-52, 2011.

7. PASSIA, N. & KERN, M. The single midline implant in the edentulous mandible: a systematic review. In Clinical oral investigations. v 18, n. 7, pp. 1719–1724, 2014.

8. SB Brasil 2010: Pesquisa Nacional de Saúde Bucal: resultados principais / Ministério da Saúde. Secretaria de Atenção à Saúde. Secretaria de Vigilância em Saúde. – Brasília: Ministério da Saúde, 2012.

9. SILVA, E.T., OLIVEIRA, R.T., LELES, C.R. Fatores associados ao edentulismo funcional em idosos brasileiros. Com Ciências Saúde. 27(2):129-138, 2016.