Oral Health Assessment in Patients who will be Submitted Hip Arthroplasty

Raquel Coelho Netto da Costa[1]*, Guilherme de Azevedo Cortez[1], Maria Aurea Lira Feitosa[2], Rosana Costa Casanovas[2], Lucinaldo Lobato Gomes[1], Rinaldi Gonçalves Campos[1], Edson da Conceição Braga Garcia Júnior[2]

[1]University Hospital of the Federal University of Maranhão (HUUFMA), São Luís, Brazil

[2]Dentistry College of the Federal University of Maranhão (FO - UFMA), São Luís, Brazil

ABSTRACT

Introduction: Dental treatment prior to major surgery if necessary, with a view to reducing possible postoperative infections, especially pneumonia. **Objective:** to evaluate the oral health conditions of patients who will use the THA at HUUFMA during 2019. **Material and method:** An observational descriptive study with a sample of 23 volunteers with clinical examination and intraoral clinical examination. The variables collected were sex; reason for hospitalization; systemic conditions; medications in use; oral health conditions; oral hygiene; periodontal conditions; oral mucosa conditions and individual odontogram. **Statistical analysis:** The data were tabulated in the Microsoft Excel 2016 software and were then imported into the Statistics software version 15.0 for Windows. A bivariate analysis of Pearson's linear correlation tests, from student to independent tests, analysis of variance (ANOVA oneway), Mann Whitney's nonparametric test, Fisher's exact test and chi-square test. The level of significance adopted was 5%. **Results:** Of the 23 patients studied in the majority (69.57%), female patients with clinical diagnosis of coxarthrosis (60.87%) with hypertension and diabetes (43.48% and 17.39%). The average age was 54.45 years. The most used drugs were analgesics and anti-inflammatory drugs (p <0.05), and those that were used in the use of analgesics and anti-inflammatory drugs were considered to be the best oral health indexes. Regarding oral health conditions, we observed a value of p <0.05 for periodontal disease, and patients with pre-surgical diagnosis of coxarthrosis suffered more periodontal disease than the others. The most performed dental procedure was scraping and straightening supra and sub gingival (p <0.05). **Conclusion:** The volunteers had as main diseases coxarthrosis and periodontal disease with demand for THA procedures and supra and sub gingival tooth scraping, being useful in the application of tests to reduce and control the infection.

Keywords: Oral Health; Total Hip Arthroplasty; Infection.

*Corresponding Author

Raquel Coelho Netto da Costa

Rua Barão de Itapary 227 room 32 Centro São Luís MA Brazil 65020-070. Tel: +5598981162665

E-mail: raquelcoelhon@hotmail.com

INTRODUCTION

The patient in a hospital environment needs to be monitored in a multidisciplinary way and dentists have a fundamental role in the health care of the stomatognathic system [1]. It is up to this professional to examine, diagnose and treat disorders of the mouth, teeth and maxillofacial region of hospitalized patients who have alterations that interfere with their surgical treatment and/or post-surgical recovery of the initial reason for which they are hospitalized, using clinical and surgical dental procedures [2].

The idea that dental evaluations are essential for general health care and patient care as a whole comes from the observation that various manifestations in the oral cavity can arise from systemic conditions such as diabetes, arterial hypertension, use of drugs such as bisphosphonates. (associated with osteonecrosis of the jaws), etc. But also, on the other hand, systemic diseases can be related to oral conditions, such as, for example, periodontal disease (presence of a wide variety of bacterial species in the biofilm), or even due to the presence of dento-alveolar abscesses. In both exemplified cases, there are microorganisms of different species that are available in the bloodstream as well as their inflammatory mediators [3].

Total hip arthroplasty (THA) is a procedure that aims to replace the hip joint with a prosthesis. performed by an orthopedic surgeon and team, which has increased the expectation and quality of life of these patients. In Brazil, there are few epidemiological data, and coxarthrosis is the most common indication, there is no data in the literature on the oral health condition of these patients. Postoperative complications of this surgery involve anemia, infections, thromboembolism and others. The most prevalent infections were: urinary tract infections, surgical wound infection, hematological infection and pneumonia are less common, but with high mortality and high costs [4].

In this context, dental treatment prior to major surgery is necessary with a view to reducing possible postoperative infections, especially pneumonia [5], as well as describing the characteristics of patients with regard to systemic and oral health conditions, which may be useful in formulating strategies and protocols to reduce postoperative infections in patients undergoing total hip arthroplasty (THA).

Therefore, the objective of this work is to evaluate the oral health conditions of patients who will undergo total hip arthroplasty at HUUFMA during the year 2019; as well as knowing the systemic conditions of the patients, identifying the reason for performing the surgery and verifying which drugs these patients use.

ETHICAL ASPECTS

This study was submitted to the HUUFMA research ethics committee whose approval number is 3,741,798.

METHODS

The sample of the present study consisted of 23 patients referred to the hospital's Dentistry sector by the orthopedic surgeon as a clinical protocol for total hip arthroplasty surgery. This study had a convenience sample that was recorded throughout 2019. It is an observational, descriptive study. The volunteers were interviewed according to a clinical record and submitted to an intraoral clinical examination at the HUUFMA dental office. For this clinical examination, a dental mirror with a sterile handle was used at the HUUFMA Sterilization Center (CME), and proper lighting (focus) in the dental chair.

Data collection was performed by two researchers, one who examined the patient and the other who recorded the data in the clinical record.

The variables collected were sex; reason for hospitalization; systemic conditions; medications in use; oral health conditions; oral hygiene; periodontal conditions; conditions of the oral mucosa and the individual odontogram.

STATISTICAL ANALYSIS

Data were tabulated in Microsoft Excel 2016 software and then imported into Stata software version 15.0 for Windows. The normality of the age variable was verified by the Shapiro Wilk test (p value = 0.6017) and described by mean and standard deviation. Categorical variables (dichotomous and polytomous) were described by absolute and relative frequencies. A patient oral health index was generated from the sum of the following variables: gingival bleeding, dental calculus, tooth mobility, dentoalveolar abscess, caries, periodontal disease, residual root, edentulism, abrasion and candidiasis. The scores for each variable were on a scale from the best to the worst (polytomous), or the absence or presence (dichotomous) of the aforementioned oral pathologies. The oral health index was normal (p value = 0.1211) therefore it was used as a continuous variable in the bivariate analysis. Bivariate analysis consisted of Pearson's linear correlation tests, Student's t test for independent samples, analysis of variance (one-way ANOVA), Mann Whitney's nonparametric test, Fisher's exact test and chi-square test. The significance level adopted was 5%.

RESULTS

The results were that of the 23 patients studied, the majority (69.57%) are female with a pre-clinical diagnosis of coxarthrosis (60.87%) whose most prevalent comorbidities were hypertension and diabetes with 43.48% and 17, 39% respectively. The mean age found was 54.45 years old. (see table 1)

Table 1: Demographic and clinical characteristics of pre-surgical hip arthroplasties (THA) patients and relationships with the oral health index, São Luís, 2019.

Variavel	Frequency(%)	*p value*
Age	54.45 (12.98)*	0.8826[3]
Gender		0.3860[4]
Male	07 (30.43)	
Female	16 (69.57)	
Pre surgery Diagnosis		0.2675[5]
Coxartrhosis	14 (60.87)	
Hip frature	02 (08.70)	
Prosthesis review	03 (13.04)	
Others[1]	04 (17.39)	
Clinical comorbidies		
- Arterial Hypertension		0.3323[4]
Yes	10 (43.48)	
No	13 (56.52)	
- Diabetes		0.4457[4]
Yes	04 (17.39)	
No	19 (82.61)	
- Anemia		0.1562[4]
Yes	02 (08.70)	
No	21 (91.30)	
- Gastritis		0.1238[6]
Yes	01 (04.35)	
No	22 (95.65)	
- Chronic Kidney desease		0.3171[6]
Yes	01 (04.35)	
No	22 (95.65)	
- HIV		0.2484[6]
Yes	01 (04.35)	
No	22 (95.65)	
- Psycological disorders		0.9387[6]
Yes	01 (04.35)	
No	22 (95.65)	
- Drug Allergy		0.5901[6]
Yes	01 (04.35)	
No	22 (95.65)	
Medications in use[2]		
Antihypertensives	08 (34.78)	0.0940[4]
Hypoglycemics	02 (08.70)	0.3466[4]
Analgesics/ anti-nflamatories	10 (43.48)	**0.0186**[4]
Others	08 (34.78)	0.3458[4]
- Previous surgery		0.2535[5]
Yes	12 (52.17)	
No	09 (39.13)	
Don´t know, don´t remember	02 (08.70)	

*Mean (Standard Deviation); [1]Rheumatoid arthritis, Legg Calves Perthes, Firearm projectile, Pyoarthritis; [2]Percentages exceed 100% due to some individuals using more than one medication; [3]Pearson's linear correlation; [4]Student's t test for independent samples; [5]ANOVA one-way; [6]Mann Whitney Test

The most used drugs were analgesics and anti-inflammatory drugs (p < 0.05), which were statistically significant, and the volunteers who were using analgesics and anti-inflammatory drugs had a better oral health index. (see table 2)

Table 2: Dental characteristics and oral health findings of pre-surgical hip arthroplasties (THA) patients and association with diagnosis, São Luís, 2019.

Variavel	Frequency%	p value
Oral habits		0.504[1]
Doesn´t have	17 (73.91)	
Mouth breather	03 (13.04)	
Great your teath	02 (08.70)	
Bite your nails	01 (04.35)	
Brushing teeth frequency		0.537[1]
2 x day	02 (08.70)	
3 x day	06 (26.09)	
Uninformed	15 (65.22)	
Dental floss using		1.000[1]
Use	03 (13.04)	
Not use	14 (60.87)	
Uniformed	06 (26.09)	
Oral hygiene		0.281[1]
Good	01 (04.35)	
Regular	19 (82.61)	
Deficient	03 (13.04)	
Gingival bleding		0.234[1]
Yes	06 (26.09)	
No	17 (73.91)	
Dental calculus		0.682[1]
Yes	15 (65.22)	
No	08 (34.78)	
Dental mobility		1.000[1]
Yes	03 (13.04)	
No	20 (86.96)	
Dentoalveolar abcesss		0.736[1]
Yes	03 (13.04)	
No	20 (86.96)	
Caries		1.000[1]
Yes	10 (43.48)	
No	13 (56.52)	
Periodontal deasease		**0.048**[2]
Yes	08 (34.78)	
No	15 (65.22)	
Residual root		1.000[1]
Yes	03 (13.04)	
No	20 (86.96)	
Edentulism		0.321[1]
Yes	08 (34.78)	
No	15 (65.22)	
Abrasion		0.174[2]
Yes	01 (04.35)	
No	22 (95.65)	
Candidiasis		1.000[1]
Yes	01 (04.35)	
No	22 (95.65)	

[1]Fisher's exact test; [2]chi-square test.

Regarding oral health conditions, we observed a p-value <0.05 for periodontal disease, and patients with a pre-surgical diagnosis of coxarthrosis had more periodontal disease than the others. Consequently, the most frequently performed dental procedure was supra and subgingival scaling and smoothing (p<0.05, see table 3).

Table 3: Dental procedures performed in pre-surgical patients undergoing hip arthroplasty (THA) and relationship with previous diagnosis, São Luís, 2019.

Variavel	Frequency (%)	p value
oral hygiene guidance		0.243[1]
Yes	10 (43.48)	
No	13 (56.52)	
Extraction		0.486[1]
Yes	08 (34.78)	
No	15 (65.22)	
Supra and subgingival scaling		**0.041**[1]
Yes	13 (56.52)	
No	10 (43.48)	
dental restoration		0.332[1]
Yes	03 (13.04)	
No	20 (86.96)	
drug prescription		0.419[1]
Yes	02 (08.70)	
No	21 (91.30)	
Topical fluoride application		0.391[1]
Yes	01 (04.35)	
No	22 (95.65)	

[1]Fisher's exact test;

DISCUSSION

Several studies show that patients who undergo hip arthroplasty surgery are mostly female, with coxarthrosis, systemic arterial hypertension and diabetes mellitus [6,7,8,9]. In the present study, the prevalence of systemic arterial hypertension was 43.48%, orthopedic studies that evaluated complications after hip arthroplasty reported 64%, 50.4% and 45.9% for arterial hypertension systemic [4,10,11].

Of the patients studied, 17.39% had a diagnosis of Diabetes mellitus. In other studies, we found variations in the prevalence of Diabetes mellitus from 9.2% to 34.2% [10,11]. The association between diabetes mellitus and infection [12] as well as periodontal disease and diabetes mellitus is well established in the literature [13].

The most declared international classification of diseases (ICD 10) in the studied sample was M16.9 (unspecified coxarthrosis) with 60.87% of patients. In other studies, coxarthrosis was also used as a diagnosis of THA indication, with percentage averages ranging from 49.1% to 92.4% [4,6,7,8]. In these patients with coxarthrosis, our study showed a higher prevalence of periodontal disease.

Many of these patients who have coxarthrosis use medications such as analgesics and anti-inflammatory drugs for a long time, and the repercussions in the oral cavity of the prolonged use of these medications are contradictory, pointing to benefits for the periodontal tissues with non-steroidal anti-inflammatory drugs. and for steroidal anti-inflammatory drugs a possible harmful effect on the periodontium [14].

Finding periodontal disease in this group of patients is important for effective prevention of tooth loss, reduction and control of oral biofilm prior to major surgery. Since, after urinary tract infection, the most prevalent complications were surgical site infection and respiratory failure. 4 And patients with respiratory failure may be subject to orotracheal intubation during hospitalization with an increased risk of ventilator-associated pneumonia, and the previous sub- and supra-gingival scaling procedure reduces the oral microbial load, thus preventing the incidence of respiratory diseases [15].

CONCLUSION

The results of this study show that patients who will undergo hip arthroplasty surgery, who went through the HUUFMA Dentistry service in 2019, had coxarthrosis and periodontal disease as their main diseases, requiring THA and dental scaling procedures. supra and subgingival. Thus characterizing the patients of this hospital being essential to compare with other hospitals and fundamental to improve health care being useful in the formulation of strategies to reduce and control infection.

ACKNOWLEDGMENTS

CONFLICT OF INTEREST

I declare that there is no conflict of interest.

REFERENCES

1. Santos PS. (2012) Medicina Bucal – A prática na Odontologia Hospitalar. 1ª ed. Editora Santos;

2. Camargo EC. (2005). Odontologia Hospitalar é mais do que Cirurgia Bucomaxilofacial. 2011 Jul [capturado 2011 jul 19]; Disponível em: http://www.jornaldosite.com.br/arquivo/anteriores/elainecamargo/artelainecamargo98.htm.

3. Beikler T , and Flemming TF. (2011). Oral biofilm-associated diseases: trends and implications for quality of life, systemic healthy and expenditures. Periodontol 2000. 55 (1): 87-103.

4. Falcão FRC, Dias BAG, Wolfovitch LA, and Sardigursky D. (2016). Complicações pós-artroplastia total do quadril em portadores e não portadores de diabetes mellitus controlado durante a internação. Revista da Sociedade Brasileira de Ortopedia e traumatologia. 51(5): 589-596.

5. Vilela MCN, Ferreira GZ, Santos PSS, and Rezende NPM. (2015). Cuidados bucais e pneumonia nosocomial: revisão sistemática. Einstein. 13(2): 290-296.

6. Keurentjes JC. (2014). Predictors of clinical outcome in total hip and knee replacement: a methodological appraisal of implants and patient factors. [tese]. Leiden, Holanda: Leiden University; [capturado 2015 nov 3]; 2: Disponível em: https://openaccess.leidenuniv.nl/handle/1887/28958.

7. Abdel Salam H, Restrepo C, Tarity TD, Sangster W, and Parvizi J. (2012). Predictors of intensive care unit admission after total joint arthroplasty. J Arthroplasty. 27(5): 720-725.

8. De Beer J, Petruccelli D, Adili A, Piccirillo L, Wismer D, et al. (2012). Patient perspective survey of total hip vs totalknee arthroplasty surgery. J Arthroplasty. 27(6): 865-869.

9. Tirkkonen K, Hurme S, Rautava P, and Virolainen P. (2013). Electronicmedical records for appropriate timing of arthroplasty. J EvalClin Pract. 19(1):209-213.

10. Lenza M, Ferraz SB, Viola DCM, Garcia Filho RJ, Cendoroglo Neto M, et al. (2013). Epidemiologia da artroplastia total de quadril e de joelho: estudo transversal. Einstein. 11(2):197-202.

11. Piano LPA, Golmia RP, and Scheinberg M. (2010). Artroplastia total de quadril e joelho: aspectos clínicos na fase perioperatória. Einstein. 8(3): 350–353.

12. Rocha LLJ, Baggio CCH, Da Cunha AC, Niclewicz EA, Leite SAO, et al. (2002). Aspectos Relevantes da Interface Entre Diabetes Mellitus e Infecção. Arq Bras Endocrinol Metab. 46 (03).

13. Esteves LMB, Santos FS, Pires JR, Toledo BEC, Camargo GACG, et al. (2017). Doença periodontal em pacientes diabéticos descompensados portadores de síndrome metabólica. Rev Odontol UNESP. 47(N Especial): 61.

14. Cavagni J, Muniz FWMG, and Rosing CK. (2016) Efeito do uso de agentes moduladores de resposta inflamatória em gengivites e periodontites. RGO, Rev Gaúch Odontol. 64 (3): 312-319.

15. Santos Junior JCM, and Carvalho CCB. (2019). Indicadores assistenciais na Odontologia Hospitalar. p. 1-6. Available at: https://dspace.uniceplac.edu.br/bitstream/123456789/240/1/Jo%C3%A3o_Monteiro_0002617.pdf