



Full Length Research Article

DECAYED-MISSING-FILLED INDEX DETERMINATION IN ARTHRITIC YUCATECAN PATIENTS. MEXICO. 2015

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ABSTRACT

Introduction: association between oral and general health is relevant to the medical and dental communities. Different types of arthritis present manifestations in the oral cavity (infectious or inflammatory processes, and immunopathogenic mechanisms) involving both hard and soft oral tissues, which leads to problems such as difficulty for chewing and swallowing of food.

Objective: to determine decayed-missing-filled index in arthritic patients attended in the Faculty of Dentistry of the Autonomous University of Yucatan, Mexico, 2015.

Methods: Descriptive, transversal and observational study. Non-probabilistic sampling by convenience. A total of 40 previously diagnosed by rheumatologist arthritic patients, 20 years and older, were included; 5% men and 95% women consulted the Faculty of Dentistry in april-december 2015 time period.

Informed and voluntary consent was obtained, and a questionnaire was applied including: demographic data, medical history, type of arthritis; clinical exploration by calibrated operator, observing decayed, missing and filled dental structures registering in odontogram. The obtained data was analyzed with descriptive statistics.

Results: rheumatoid arthritis was the most prevalent (67.5%), most frequent age interval was from 60 to 69 years (30%). 1120 dental areas were analyzed from 40 arthritic patients, 51.79% was presented as decayed, missing or filled. A decayed-missing-filled index of 14.5 was obtained, corresponding to the very high level according to the WHO.

Conclusions: dental decay is frequent in patients with arthritis; evolution of decay is evident in the loss and filling of dental structures. These frequent changes in dental structures may compromise normal functions of the masticator system, diminishing patients' quality of life.

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INTRODUCTION

Arthritis is part of the group of rheumatic diseases; it affects articulations, tendons, ligaments and muscles mainly by causing inflammation, pain and functional incapacity.

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More than 10% of the total population is affected, constituting an important cause of morbidity and deterioration of the quality of life. This disease is more prevalent every day. In Mexico, a 14% of prevalence has been identified, with a 2.8% in Yucatan, a state of Mexico (Ventura-Ríos et al., 2012 and Peláez Ballestas, 2011). In recent years, the association between oral and general health has been a theme of interest to the medical and dental communities. Most systemic diseases have buccal manifestations. Signs and symptoms of buccal

injuries are a motive for dental consultation, and in many cases, may precede systemic manifestations, or even be the only indication of a pathological process. These injuries develop in buccal mucous membrane, tongue, gum, dental structures, periodontal tissues, salivary glands and facial skin (Reyes-Hernández, 2016 and Kumar, 2015). Therefore, state of the oral health gives evidence of the systemic behavior of the patient (Chaar Reis *et al.*, 2015). Rheumatologic diseases, including the different types of arthritis, same as other systemic diseases such as diabetes, hypertension or infectious diseases, commonly show manifestations in the buccal cavity; the most frequent are: ulcerations, decay processes, xerostomia and injuries in the mucous membrane with peculiar characteristics (Chaar Reis, 2015). Different studies explain the relation between buccal affectations and rheumatic diseases, not only for the related infectious or inflammatory processes, but the immunopathogenic mechanisms that involve hard and soft buccal tissues. This leads to the appliance of etiological models that interrelate both groups of diseases, so currently it has been proposed that it is not possible to achieve an adequate control of the rheumatic disease without taking special care of the patient's oral health, aspect often ignored (Solís Cartas, 2014 and Mays, 2012).

In general, rheumatic diseases decrease patient's quality of life, and added to adverse buccal manifestations, conduct to multiple buccal problems such as difficulty for chewing and swallowing of food, especially in patients with prosthetic dentures, inadequate restorations and absence of dental structures, which affects patients' oral health and biopsychosocial state (Ahola *et al.*, 2014). According to the World Health Organization, dental decay is the main buccal ailment, constituting an important public health problem due to its magnitude and transcendence, it affects mainly children and young adults, but can affect any person; it is recurrent in older adult populations, given that they have conserved their own dentures for longer time, and persons with systemic deficiencies. If not attended opportunely, dental decay leads to restoration or loss of dental structure, which in many occasions causes a deficient oral health in the patient (González Rodríguez *et al.*, 2014 and Bustillos Ramírez, 2015). Given that arthritis is a rheumatic disease that has been increasing in recent years, and dental decay is the main oral disease that, same as arthritis, leads to deterioration of buccal functions, the objective of determining the "decayed-missing-filled-tooth" (DMFT) index in arthritic patients attended in the Faculty of Dentistry of the Autonomous University of Yucatan, Mexico in 2015 was established.

MATERIALS AND METHODS

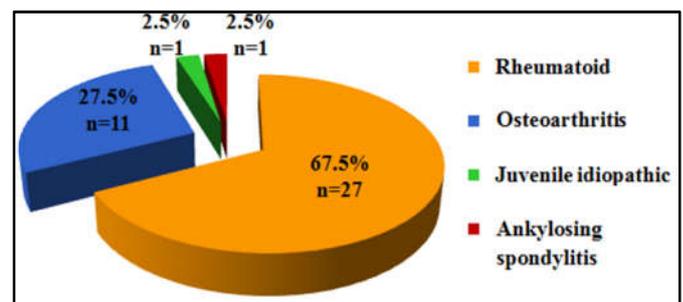
A descriptive, transversal and observational study was made. Sample consisted of 40 patients that met the inclusion criteria. These patients were previously given the diagnosis for arthritis by a rheumatologist or general practitioner, ages 20 and older, 5% were men and 95% women that consulted the Faculty of Dentistry of the Autonomous University of Yucatan in the time period comprehended between April and December of 2015. Patients with neurological deficiencies and pregnant women were excluded to avoid any possible risk. Informed and voluntary consent letter was obtained according to bioethical principles established by the Declaration of Helsinki

from the World Medical Association, and it was approved by the Research Ethics Committee from the Regional Research Center "Dr. Hideyo Noguchi" in august 24th, 2015. It was voluntarily signed or fingerprinted according to the case. A questionnaire, registering demographic data, and a medical history -including the type of arthritis, time of evolution and characteristics of their daily activities given the disease- was applied. For clinical exploration the patient was requested to lie in supine position while reclined in the dental chair; it was made by an operator calibrated for that purpose and according to the Official Mexican Norm NOM-013-SSA2-2006 (SEGOB/Secretaria de Salud, 2008) for infection control (gloves, cap and disposable face mask, sterile instrumental, clinical gown and glasses), observing decayed, missing and filled dental structures, proceeding in order, and registering in odontogram the situation of each dental structure.

All obtained data was registered, ordered, analyzed and presented by using descriptive statistics with frequencies and percentages through boards and graphics. Chi-squared independence test (Zar, 2010) was used to determine if the affected dental structure relates with: 1) type of arthritis and 2) age group. Statistic samples were considered significant when $P < 0.05$, and statistical package SPSS 22 (IBM Corp, 2012) was used. Likewise, DMFT indexes were obtained from studied patients according to the type of arthritis, and were analyzed according to the severity scale for the DMFT indexes established by the World Health Organization: from 0 to 1.1, very low; from 1.2 to 2.6, low; from 2.7 to 4.4, moderated; from 4.5 to 6.5, high, and above 6.6, very high (Gómez Ríos, 2012).

RESULTS

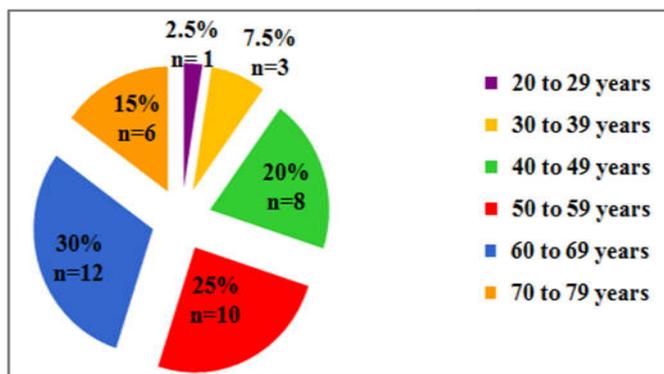
Rheumatoid arthritis was the most prevalent with 67.5% (n=27) (Figure 1).



Source: measuring instrument 2015

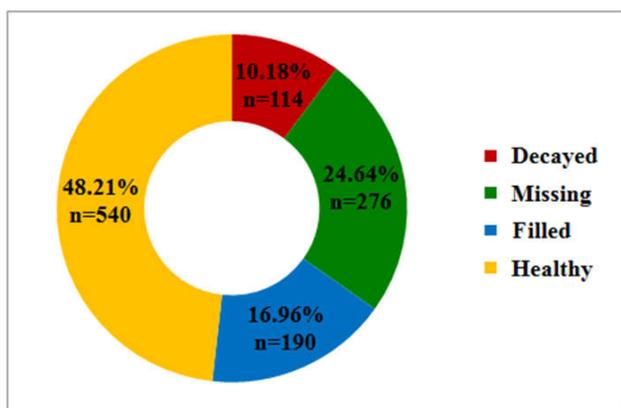
Figure 1. Types of arthritis from 40 studied patients. FOUADY 2015

The most frequent age intervals with 30% and 25% were from 60 to 69 years and from 50 to 59 years (Figure 2). A total of 1120 dental areas from 40 patients with any type of arthritis were analyzed, and it was obtained that a 51.79% (n=580) was presented as decayed, missing or filled (DMFT index) (figure 3). From 580 (100%) dental areas classified as DMFT index, it turned out that affected dental structure is related with the type of arthritis ($\chi^2=14.8641$, $P=0.0213$, d.f.= 6); patients with rheumatoid type of arthritis had a prevalence of 33.45% (n=194) of missing dental structures (Chart 1).



Source: measuring instrument 2015.

Figure 2. Groups of ages from 40 patients with arthritis. FOUADY 2015



Source: measuring instrument 2015

Figure 3. Status of 1120 analyzed dental areas from 40 patients with arthritis. FOUADY 2015

From the 580 dental areas, it turned out that the affected dental area is related with the age group ($\chi^2=60.0635$, $P<0.0001$, $d.f.=10$); losses in ages comprehended between 60 and 69 years, were more prevalent (chart 2). A community DMFT index of 14.5 was obtained from studied patients, corresponding to the very high level (due to being higher than 6.6) for all four types of arthritis, according to severity levels for the DMFT index given by WHO (chart 3).

DISCUSSION

A study by Ahola *et al*, in 2014, about the impact of rheumatic disease in oral health, cites women with higher prevalence with 51.4%, ages between 60-69 years with 36.8% and rheumatoid arthritis with 49.7% (8), being similar to this study with higher prevalence in women (95%), ages between 60-69 with 30% and rheumatoid arthritis with 67.5%. An investigation by Reis *et al* in 2015, about buccal manifestations in rheumatologic patients, cites dental decay as the main one, as well as rheumatoid arthritis as the rheumatic disease with the higher prevalence of adverse oral manifestations (5), coinciding with this investigation, in which a total of 1120 dental areas from 40 patients with arthritis were studied, finding that a 10.18% presented dental decay, a 16.96% were filled and a 24.64% were missing, being rheumatoid arthritis the most affected in buccal condition with a 68.62%. Bustillo *et al*, 2015, in an article about decay and buccal injuries in older adults, found a dental decay prevalence of 61.87% in the studied population, being more frequent in adults in ages between 65-69 years (12), similar to what was found in this study in which dental decay was more frequent in ages comprehended between 60-69 years. Figueiredo *et al*, 2013, registered missing dental structures in 13.4% of

Chart 1. Relation of 580 affected dental areas in 40 studied patients with different types of arthritis. FODAUY 2015

Type of arthritis	Decayed n (%)	Missing n (%)	Filled n (%)	Total n (%)
Rheumatoid	78 (13.45)	194 (33.45)	126 (21.72)	398 (68.62)
Osteoarthritis	29 (5)	78 (13.45)	52 (8.96)	159 (27.41)
Juvenile idiopathic	5 (0.86)	0	4 (0.69)	9 (1.55)
Ankylosing spondylitis	2 (0.34)	4 (0.69)	8 (1.39)	14 (2.42)
Total	114 (19.65)	276 (47.59)	190 (32.76)	580 (100)

Source: measuring instrument 2015.

Chart 2. Relation of 580 affected dental areas in 40 studied patients according to age. FODAUY 2015

Agegroups	Decayed n (%)	Missing n (%)	Filled n (%)	Total n (%)
20-29 years	3 (0.52)	0	7 (1.20)	10 (1.72)
30-39 years	12 (2.07)	7 (1.20)	13 (2.25)	32 (5.52)
40-49 years	27 (4.65)	35 (6.04)	40 (6.90)	102 (17.59)
50-59 years	29 (5)	50 (8.62)	56 (9.65)	135 (23.27)
60-69 years	31 (5.34)	114 (19.65)	55 (9.49)	200 (34.49)
70 and more years	12 (2.07)	70 (12.07)	19 (3.27)	101 (17.41)
Total	114 (19.65)	276 (47.59)	190 (32.76)	580 (100)

Source: measuring instrument 2015.

Chart 3. DMFT indexes and its components according to the type of arthritis studied

Type of arthritis	DMFT	Component Decayed	Missing	Filled
Rheumatoid	14.74	2.89	7.18	4.67
Osteoarthritis	14.45	2.64	7.09	4.73
Juvenile idiopathic	9	5	0	4
Ankylosing spondylitis	14	2	4	8
Total	14.5	2.85	6.9	4.75

Source: measuring instrument 2015

evaluated adults, being more prevalent in people between 50-64 years with 25.7%. Related to filled dental structures, a higher prevalence was obtained in ages between 19-35 years with 51.6%. Regarding dental decay, it was more prevalent with 24.7% in ages between 19-35 years. In FDAUY, a 24.64% of missing dental structures was obtained, being more frequent in people of ages 60-69 years with 19.65%, existing a similitude with the first study. Concerning filled dental structures, a higher prevalence was found in ages between 50-59 years with 9.65%, not coinciding with the first study. About dental decay a higher prevalence of 5.34% was found in ages 60-69 years, not being similar to the first study. Esquivel and Jiménez, 2012, in their publication, obtained a DMFT index of 29.74: in decayed teeth 2.06, 27.47 in missing and 0.21 in filled. In this study the DMFT was 14.5: in decayed teeth 2.85, 6.9 in missing and 4.75 in filled, being both studies similar only in decay index. Similarly, Moya *et al.* (2014), in his dissertation about dental decay in adults, found a DMFT of 3.8, not according with this study.

Conclusions

Dental decay is frequent in patients with arthritis, evidencing the evolution of decay with the loss or replacement with fillings of dental structures. Given this frequent changes in dental structures, masticatory system functions may be compromised, diminishing the oral health quality of arthritic patients, as systemically its function is already compromised. So an interdisciplinary relation between dentist and medic should exist to treat buccal conditions and systemic affectations of the patient in an integrated form, conducting to therapeutic success, improvement in functionality and general health for the patient.

REFERENCES

- (2013). Declaración de Helsinki de la Asociación Médica Mundial. Principios éticos para las investigaciones médicas en seres humanos. Fortaleza, Brasil: Adoptada por la 64ª Asamblea General.
- Ahola K, Saarinen A, Kuuliala A, Leirisalo Repo M, Murtomaa H, Meurman JH. 2014. Impact of rheumatic diseases on oral health and quality of life. *Oral Diseases*, 20, pp.567-573.
- Bustillos Ramírez L, Arellano Gámez LA, Zambrano Vergara R, Manoochehri González A. 2015. Prevalencia de caries y lesiones bucales en adultos mayores institucionalizados en Mérida-Venezuela. *Revista Odontológica de los Andes*, 10, pp.19-24.
- Chaar Reis, T.R., Lima Nogueira BM, Lantigua Domínguez MC, Fernandes de Menezes SA, De Almeida Rodrigues P, Oliveira de Alencar T. 2015. Manifestaciones Orales en Pacientes Reumatológicos: una Revisión de los Conocimientos. *Int J Odontoestomat*, 9, pp.413-418.
- Esquivel Hernández, R.I., Jiménez Férrez J. 2012. Efecto de la utilización de prótesis dentales en la percepción de salud bucal. *Revista ADM*, 69, pp.69-75.
- FigueiredoCancado, M., Barbará Salau, L., Missel Heredia, M., Santos Morales, M, Vacca, V. 2013. Relación entre enfermedades crónicas y salud-enfermedad bucal en adultos brasileiros de bajo nivel socioeconómico. *Odontoestomatología*, 15, pp.20-29.
- Gómez Ríos NI, Morales García MH. 2012. Determinación de los índices CPO-D e IHOS en estudiantes de la Universidad Veracruzana, México. *Rev Chil Salud Pública*, 16, pp.26-31.
- González Rodríguez S, Pedroso Ramos L, Rivero Villaón M, Reyes Suarez VO. 2014. Epidemiología de la caries dental en la población venezolana menor de 19 años. *Revista de Ciencias Médicas*, 20, pp.208-218.
- Grover HS, Gaba N, Gupta A, Marya CM. 2011. Rheumatoid arthritis: a review and dental care considerations. *Nepal Med Coll J*, 13, pp.74-76.
- IBM Corp. 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.
- Kumar K, Uppalwar P. 2015. Mouth- A diagnostic mirror of various diseases. *IJSS Case Reports and Reviews*, 1, pp.35-38.
- Mays JW, Sarmadi M, Moutsopoulos NM. 2012. Oral manifestations of systemic autoimmune and inflammatory diseases: diagnosis and clinical management. *J Evid Based Dent Pract*, 12, pp.265-282.
- Moya Rivera, P, Caro Cassali, J.C, Velásquez Bardavid, D., Sarquis Abusada, F. 2014. Caries dental y necesidad de tratamiento protésico en adultos. Comuna de Macul 2014. *Revista Dental de Chile*, 106, pp.25-28.
- Peláez Ballestas, I., Sanin, L.H., Moreno Montoya, J., Álvarez, Nemegyei, J, Burgos Vargas, R., Garza Elizondo, M, *et al.* 2011. Epidemiology of the rheumatic diseases in México. A study of 5 regions based on the COPCORD methodology. *J Rheumatol*, 38, pp.3-6.
- Reyes-Hernández, D.L. 2016. Manifestaciones orales de las enfermedades sistémicas: Reflexión médica y revisión bibliográfica. *Acta Médica del Centro*, 10, pp.68-74.
- SEGOB/Secretaría de Salud. 2008. Modificación a la Norma Oficial Mexicana NOM-013-SSA2-1994, Para la prevención y control de enfermedades bucales, para quedar como Norma Oficial Mexicana NOM-013-SSA2-2006, Para la prevención y control de enfermedades bucales. México DF: Diario Oficial de la Federación.
- Silvestre Rangil J, Bagán L, Silvestre FJ, Bagán JV. 2016. Oral manifestations of rheumatoid arthritis. A cross-sectional study of 73 patients. *Clin Oral Invest*.
- Solís Cartas U, García González V. 2014. Relación entre afecciones bucales y enfermedades reumáticas. *Revista Cubana de Reumatología*, 16, pp.322-328.
- Ventura-Ríos, L., Bañuelos-Ramírez, D., Hernández-Quiroz, M.C., Robles San Román, M., Irazoque Palazuelos, F, Goycochea Robles, M.V. 2012. Terapia bilógica: sobrevida y seguridad en padecimientos reumáticos. *ReumatolClin*, 8, pp.189-194.
- Zar, J.H. 2010. *Biostatistical Analysis*. New Jersey, USA: Prentice-Hall.
