

Ciências Odontológicas: Desenvolvendo a Pesquisa Científica e a Inovação Tecnológica

Emanuela C. dos Santos
(Organizadora)



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APRESENTAÇÃO

É notável o avanço da ciência e da tecnologia em nosso cotidiano. Grandes descobertas tornaram a vida mais prática e mais ágil. Porém algo novo e inesperado pode surgir e confrontar nossas certezas. O surgimento de situações inusitadas e desafiadoras nos faz perceber que nosso conhecimento ainda é ínfimo e que necessitamos de mais evolução sustentável.

As ciências odontológicas também se encontram neste quadro, onde muito já se alcançou, mas muito mais se faz necessário. Este e-book traz um compilado de artigos, entre pesquisas clínicas, *in vitro* e revisões que demonstram os avanços no desenvolvimento da pesquisa científica e a inovação tecnológica dentro da área, dando mais um grande passo rumo à evolução desta ciência tão refinada.

Que a leitura deste livro digital possa amplificar seu conhecimento, bem como despertar novas ideias para que, quem sabe você, tenha o insight para uma nova descoberta.

Ótima Leitura!

Emanuela C. dos Santos.

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PROFILE OF ORAL MANIFESTATIONS IN ADULTS AT CHRONIC PHASE OF CHIKUNGUNHYA

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INTRODUCTION

Arboviruses are exanthematic diseases transmitted by blood-sucking arthropods that include infections by Dengue, Zika and Chikungunyaviruses (AUBRY, 2015). In addition to Dengue (DEN) and Zika, other arboviruses may cause symptoms similar to chikungunya (CF) fever, which among those, the only one found in Brazil is Mayaro, responsible for the development of Mayaro fever, which, in addition to acute symptoms similar to those of infection by CHIKV has arthritogenic characteristics with also potential for chronification (MARQUES, 2017)

The clinical manifestations of these infections are very similar, although the comorbidities are different. It is known that the sooner the diagnosis of infection and determination of the etiological agent, the lower the chances of the patient to develop the morbidities related to the underlying disease (IACS, 2016).

CHIKV was initially isolated in Tanzania around 1952. Since then, there have been reports of outbreaks in several countries around the world (BRAZIL, 2017). From 2006, Chikungunya fever has emerged, even in non-endemic areas, as an important disease in returning travelers. In fact, travelers emerged as

sentinels, transporters and transmitters of the disease (MOHAN et al, 2010).

In the Americas, in October 2013, a major chikungunya epidemic began on several Caribbean islands. In recently affected communities, the striking feature is epidemics with high rates of attack ranging from 38% to 63%. In Brazil, autochthonous transmission was confirmed in the second semester of 2014, firstly in the states of Amapá and Bahia, currently the only state in the country without autochthonous cases is Rio Grande do Sul (BRAZIL, 2017). Until November 2014, more than 1.000 cases were reported in Brazil (AZEVEDO, 2015).

The clinical presentation of CHIKV generally follows three phases which are the following: 1) the acute phase, less than 3 weeks; 2) the subacute phase lasting from three weeks to three months and 3) the chronic phase, over 3 months. The clinical presentation may be mild, moderate or severe and most of the symptoms decrease within 3 weeks after the onset of symptoms. Some of the symptoms may persist for 3 months and even longer. Normally, 10 to 15% of patients present with severe progression of CHIKV to the subacute or chronic phase. The most common clinical manifestations are fever, arthralgia / arthritis, low back pain, headache, rash and pruritus (INDIA, 2016).

In the laboratory evaluation of CF cases, the timeline of the disease is important in the choice of diagnostic tests for their correct interpretation. In the acute phase, the diagnosis should be made in clinical and epidemiological criteria. In patients at risk (elderly, pregnant, young children and those with comorbidities) only the blood count is recommended. The sensitivity of the IgM capture ELISA is low for most patients in the acute phase of the disease (days 1 to 5); therefore, a negative IgM capture ELISA result does not exclude a diagnosis of CHIKV infection (KASHYAP, 2010).

The CHIKV viruses have been identified in saliva (MUSSO et al., 2016), their potential for infection is limited by the presence of enzymes such as lactoferrin and histatins that may inhibit the pathogenic mechanisms of viruses (LEAO, 2016).

These diseases have appeared very frequently in Brazil, since they are a tropical country and they also comprise a field with few studies related to oral manifestations (LEAO, 2016). Although the data are scarce in relation to the oral manifestations of arboviruses, it is unknown whether the presence of the virus in the saliva can be etiologic factor of the lesions associated with these infections. The literature reports that there is an association between some of these infections and the appearance of oral ulcers (FOY, 2011).

Given the paucity of literature data on the stomatognathic manifestations associated with CHIKV infection in adults in the chronic phase, this is a pioneering study involving this group of patients. Thus, the study sought to obtain information regarding the aspects of these alterations from the evaluation of laboratory and clinical data.

An important factor is that once the sustained transmission of CHIK in a given area has been characterized, with the laboratory confirmation of the first cases, the Ministry of Health recommends that the other cases be confirmed by clinical-epidemiological criteria (BRASIL, 2014).

METHODS

The present study was approved at the Arthur Ramos Memorial Hospital (data collection) and LACEN AL SESAU (laboratory tests). This study was approved in the ethics committee with the number 1,738,596, date: 9/21st/2016.

The selection of the sample was for convenience with a number of 40 patients in the chronic phase of CHIKV. The stratification of the sample came from 1.111 hospital records of cases of adults over 18 years of age with suspected arbovirus infections between the years 2015 and 2016. To collect the data, a questionnaire was developed and filled out with information related to age, present oral manifestations and specific for each patient.

Individuals eligible to participate in the study, volunteers older than 18 years and who presented signs and symptoms of the chronic phase, with clinical suspicion of CHIKV infection, were submitted to peripheral blood collection for the purpose of serological tests for immunoglobulin (Ig) of CHIKV, for proof. We excluded from the study volunteers who refused to participate and who did not agree to sign TCLE, as well as those who had used antiviral and antibiotic in the last month. Also excluded were those who presented incomplete medical records with information that was compromised or whose lack of information made the results of the study unfeasible. Only those who met the inclusion criteria were invited to participate in the study and were informed about the nature of the research in its entirety by reading the Term of Free and Informed Consent - TCLE, which was signed after understanding and authorization of its participation in the research.

After complete paramentation with personal protective equipment (PPE - cap, mask, glove and lab coat) the stomatognathic evaluations were performed and this information was recorded in a specific form.

The stomatognathic evaluation was carried out with inspection of all oral cavity with the aid of allogenic LED emitting (Laser Emission Diode), spatulas and sterile gauze. Patients were categorized according to the presence or absence of stomatologic lesion that was subcategorized in: infectious (bacterial, viral or fungal) or suspected or non-proliferative lesion.

During evaluation of the temporomandibular joint (TMJ), the pattern of movement of the joint was inspected when performing the opening movement, verifying if it is symmetrical or if deviation or deflection occurs during movement. Requested the active movement of the joint to detect if there was any joint blockage. During the performance of the active movements by the patient, the functional capacity of the individual to perform them was evaluated, observing their beginning and sequence. Checked if there was presence of pain, at what intensity and if there were tissue edemas. Signs and alterations were recorded. The palpation of the joint was performed simultaneously on both sides of the face, after the examiner inserted the index finger into the patient's ear canal in the external auditory meatus and pressed gently forward, in a state of rest and in movement of opening and closing the mouth.

To assess the range of motion, the patient was asked to perform left, right and right ventricular opening, protrusion and laterality movements. The amplitude reached was measured with the aid of a tape measure, pachymeter or ruler, measuring from the upper

teeth to the lower ones. The presence of joint noises (clicks and / or crackles) during active movement of the joint was observed and at which stage of movement they occurred (beginning / middle / end).

The Fonseca Questionnaire and Anamnestic Index was applied to characterize the severity of TMD symptoms. For each of the questions in the Fonseca Questionnaire (QF) three answers (yes, no and sometimes) are possible for which three scores are preset (10, 0 and 5, respectively): without DTM (0 to 15 points), (20 to 45 points), moderate TMD (50 to 65) and severe TMD (70 to 100 points), (CHAVES et al, 2008).

The information collected from the forms was transferred to a Microsoft Excel spreadsheet (Microsoft Corporation, USA) and then transferred to the SPSS 17 for Windows software (Statistical Package for Social Sciences; IBM USA) for statistical analysis. The significance level for all tests will be 5% ($p \leq 0.05$).

RESULTS

The study consisted of 40 patients, all in the chronic phase of the disease, on average 13 months. These patients were examined according to the proposed evaluation and in the sample, a predominance of 90% (36 patients) and 10% of the male gender was found in relation to gender characteristics, as shown in Table 1. These results corroborate a research in the states of Amapá and Goiás in patients with suggestive CHIKV, being 24% male and 76% female (KOGA, 2017). This finding may also be due to the greater female search for health services, thus contributing to a greater number of notifications (LIMA, 2018).

Age Group	Female		Male		Total	%
	N	%	N	%		
≤ 45	17	42.50%	3	7.50%	20	50.00%
> 45	19	47.50%	1	2.50%	20	50.00%
Total	36	90.00%	4	10.00%	40	100.00%

Table 1 - Percentage of distribution by gender and age group.

Distribution of the sample of patients affected by CHIKV according to gender and age group in the outbreak period of 2015-201

Source: Research Data

Regarding age distribution, as can be seen in Table 1, 50% of the patients were 45 years old and 50% were older than 45, when compared to other studies it was noticed that the main risk factors for chronification were age above 45 years. The prevalence of the chronic phase is very variable among the studies, reaching more than half of the patients. The main risk factors for chronification are: age over 45 years and female (BRAZIL, 2017).

Oral alterations analyzed by means of physical examination, was seen in 5% of the patients (2/40), reopresented by recurrent aftous ulcers “like” (RAUL), with ulcerated surface, clear limits, spherical shape, normal consistency, fixed mobility, sessile insertion, sensitivity

with stimulated and non-infiltrative pain; and no biopsy was required. These findings are confirmed by a previous studies (FOY, 2011; LEAO, 2016; TELES et al., 2016) in which is reported the presence of RAUL in patients with CHIKV.

Another study published in Paraíba in 2018 (LIMA et al 2018), in which the results allowed to conclude that in the viral infection by arbovirose appeared systemic and oral manifestations, being the oral mucosa affected in 30% of the patients. This literature review published in 2018, in Paraíba, on the oral manifestations of arboviruses, reinforces data from this study that in the chronic phase oral ulcers and associated with the female gender appear (TELES et al 2016). However, the clinical manifestations related to the stomatognathic system and if the presence of these alterations could help in clinical diagnosis, remains unknown.

Another question was “If you remember any oral injury during the period or after the CHICKV illness”; 25% affirmed yes, and 75% denied any type of oral lesion. Thus, in agreement with the literature, oral manifestations may be noted and aided in diagnosis, and may present as oral crusted lesions, petechiae, gingival hemorrhage and vesicular lesions (CAMPELO et al., 2017).

In the research form for collecting the study variables, regarding on maxillofacial complaints were analyzed by means of questionnaire. Data revealed that 3 patients (7.5%) presented bitter taste in mouth, and 37 patients (92.5%) without oral alterations. This findings of oral biterness can be related due to arbovirus infection, once CHIKV is an arbovirus and this symptom was related to dengue virus (DENGUE-V) infection, which is also an arbovirus (ÁVILA; REYS; VALDES, 2013), in which study they reported bitter taste among the oral manifestations that appear in patients suffering from dengue infection.

In the physical extraoral and TMD examinations, no patient with asymmetry, facial deformity or alteration in the skin was observed in the study. In the clinical description of the lymph nodes only 20% (8/40) contained palpable lymph nodes and 80% (32/40) non-palpable lymph nodes. Lymphadenopathy was also related to DENGUE-V (ÁVILA; REYS; VALDES, 2013).

In the assessment of TMJD when the present symptoms were analyzed, it was observed that 27.5% (11/40) presented TMJD disorder (TMJD) represented by pain, being 45% on the right side, 36% on the left side and 19% on both sides; and in the signs found-secreting and clicking on the TMJD in 40% of the patients, being 36% on the right side, 32% on the left side and 32% on both sides. There are no studies to compare with the literature regarding on TMJD and CHIKV, however, in the study of ÁVILA; REYS; VALDES, (2013) arthralgia in the TMJ was related to DENV.

The specific questionnaires for TMJD are adequate tools for epidemiological or population studies, in which the objective is to draw population profiles of TMJD symptoms (CHAVES, 2008). Thus, the evaluation obtained may be useful for screening potential patients for research and for initial evaluation in the clinic (Gerstner, 1994).

In the evaluation study of the Anamnestic Index of Fonseca, where 47.5% of the patients presented no dysfunction, 35% had mild dysfunction, 10% had moderate dysfunction and 7.5% presented severe dysfunction in the present study (Figure 1).

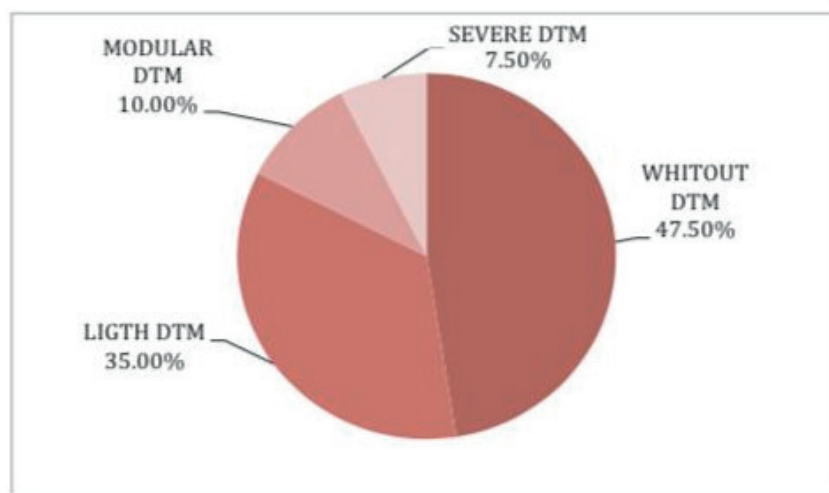


Figure 1 - Graphic distribution of agreement data with results obtained after application of Fonseca Anamnestic Index.

Source: Research data

According to Leão et al., in their study published in 2017, about the general and oral health implications, the mouth is frequently affected in the HR and the TMJD are involved in more than 6% of the cases, corroborating with the significance of synovial joint involvement.

In relation to the opening pattern, 70% were straight, 7.5% with left lateral deviation, 2.5% with corrected left lateral deviation, 7.5% with corrected right lateral deviation, 7.5% right lateral deviation and 5% left and right lateral deviation.

Villamil et al in 2005 reported maximum extent of lateral and vertical movements in the normal chewing is about half of the maximum vertical and lateral movements so in agreement with the survey in the extent of vertical movement with reference of the dental element 11/41 or 21/31 was realized the opening without aid and without pain the minimum was 2.5cm and maximum 7cm, in the maximum opening without professional assistance the minimum 3cm and maximum 7cm, in the maximum opening with the aid of the professional the minimum 4cm and the maximum of 8cm and in the trespasse vertical incisal the minimum 6cm and the maximum of 8cm.

Pereira et al., In 2005 reported that the most common articular noise was the popping, in 68.5% of the subjects, followed by crackling, in 31.5% of the sample, agreeing to the present study. Aperture, 3 in the closure and 5 in both, in relation to type 11 were clicked and 1 fine crepe.

DISCUSSION

It has been seen that CHIKV affects the temporomandibular joint and causes some stomatognathic lesions, mainly ulcerated lesion, in its acute phase and recurrent thrush in the chronic phase. In this study conducted to assess the profile of stomatognathic manifestations in adults in the chronic phase of CHIK in the hospital in the northeast the prevalence of oral

disorders in the period from 2015 to 2016 highlighted the findings were recurrent Aphthas in the chronic phase, TMJ dysfunction and that the female gender was the most affected and in the age group over 45 years. By means of the methodology used it was concluded that people who had CHIKV infection also presented TMD and may present mouth ulcers as symptoms associated with this disease.

Arboviruses have great importance in public health, considering the diversity of infectious agents involved and the different clinical manifestations, due to the fact that there are no immunoprophylactic measures for dengue, chikungunya and zika arboviruses among other factors. Since arboviruses are diseases with systemic symptomatology, there is a need to know more about the oral manifestations of these diseases and the plurality of clinical characteristics is a barrier to achieve this objective. The studies suggest that the arboviruses investigated can cause the appearance of lesions and pathologies of the stomatognathic system. However, more clinical studies are necessary for a correct correlation between these arboviruses and their respective manifestations in the oral cavity. By means of the methodology used it is concluded that people who had CHIKV infection also presented TMD and may present mouth ulcers as symptoms associated with this disease.

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Table 2 - Distribution of the extra buccal and TMJ sample of patients affected by CHIKV in the outbreak period of 2015-2016.

Oral exams	No signal	Yes signal
Pain in the ATM	29 (72.5 %)	11 (27.5%)
Click on ATM	24 (60.0%)	16 (40.0 %)

Table 2 - Extra oral examination.

Source: Research data.

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 **Atena**
Editora

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