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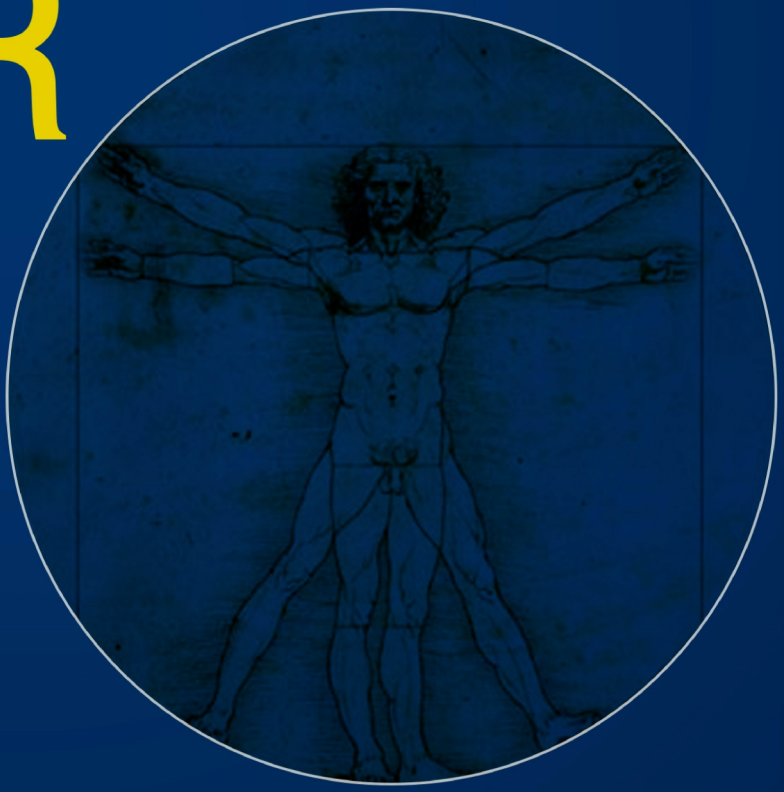

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Editorial

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Sumário summary

ORIGINAL STUDY

CASE REPORT – MEDICINE

LITERATURE REVIEW

SYSTEMATIC MONITORING OF PATIENTS WITH CHAGAS DISEASE REVEALS BENEFITS OF ETIOLOGICAL TREATMENT

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ABSTRACT

The objective of this work was to monitor before, 4.5 and 10 years after the etiological treatment 17 patients with chronic Chagas disease using serological, parasitological and molecular methods. The indirect immunofluorescence (IIF) and enzyme-linked immunosorbent assay (ELISA) results before and after 4.5 years of treatment showed no variation. The IIF reduced 2 to 3 titles in six (66.7%) of nine patients 10 years after of treatment, with ELISA remaining unchanged. Hemoculture was positive for 7 patients before treatment and for none after 4.5 years of treatment, remaining these results for nine patients in follow-up of 10 years. PCR was positive for 82.4% (14/17) patients before treatment, for 35.3% (6/17) and 11.1% (1/9) after follow-up therapeutic by 4.5 and 10 years, respectively. The results indicates the reduction of circulating parasites, justifying the specific therapy implemented and revealing beneficial action of the drug, improvement in the patient's prognosis and the importance of systematically monitor patients with Chagas' disease treated etiologically using several techniques simultaneously.

KEYWORDS: Chagas disease, etiologic treatment, systematic monitoring, several laboratories techniques.

1. INTRODUCTION

In terms of public health and economic impact, Chagas' disease is the most important parasitic infection in Latin America. Five at six millions of people are infected by *Trypanosoma cruzi* and 30% of chronic chagasic patients may develop severe abnormalities in the electrocardiogram and chagasic cardiomyopathy[1]. In endemic areas, cardiovascular problems are the main cause of death in patients with 30 to 50 years old[2]. This fact justifies the proposal of etiologic treatment for infected individuals.

Current knowledge seems to indicate that parasite persistence, coupled with an unbalanced immune response, plays a pivotal role in the development of the characteristic pathology present in both acute and chronic human Chagas' disease[3,4]. A high frequency of parasites and/or antigens associated with myocardial inflammation is an important guide to the therapeutic procedures in the chronic phase[5]. Once *T. cruzi* infection is confirmed and when clinical conditions allow, etiological treatment can benefit even patients in the chronic phase of the disease[6,7].

For evaluation of the efficacy of the etiological treatment, the serological methods (indirect immunofluorescence, IIF; and enzyme-linked immunosorbent assay, ELISA) have limitations, with the results remaining positive years after the treatment[8,9]. However, a significant decrease in titers of IIF antibodies detected in long-term follow-up of patients treated etiologically suggests that eventually the titers will be negative, which is a sign of cure[9,10].

Parasitological methods (hemoculture and xenodiagnosis) are less sensitive to monitor the etiological treatment and on the other hand polymerase chain reaction (PCR) is highly sensitive for detecting *T. cruzi* DNA[11,12] and has been proposed as a confirmative proof in the post-therapeutic monitoring of Chagas' disease[6,13,14].

In this study, we showed that systematic monitoring of chronic chagasic patients before, after 4,5 and 10 years of etiologic treatment using several techniques simultaneously is important to confirm the benefits of treatment.

2. MATERIAL AND MÉTHODS

Patients. Seventeen patients with Chagas' disease living in southern Brazil were referred by public health authorities to the Chagas' Disease Laboratory of the State University of Maringá (Laboratório de Doença de

Chagas da Universidade Estadual de Maringá, LDC/UEM). The patients gave their informed consent to terms approved by the Institutional Ethics Committee under protocol number 375/2007, accepting to participate in this study. Eleven were women and 6 men, between the ages of 27 and 59 years, with a mean of 44.5 ± 10.1 years.

Laboratory tests. Serological, parasitological and molecular tests were performed before, 4.5 years after etiologic treatment for all patients and 10 years after for nine patients.

From patients, five milliliters of blood were collected and indirect immunofluorescence (IIF) and enzyme-linked immunosorbent assay (ELISA) tests were carried out. The IIF test was performed using *T. cruzi* antigen and anti-IgG fluorescein conjugates (Biolab, Rio de Janeiro, Brazil), in accordance with the manufacturer's recommendations. A titer of 40 or higher was considered positive. ELISA was performed with Abbott's Chagas enzyme-immunoassay reagents, ELISA the Chagatest-ELISA recombination v.3.0 diagnosis kits (Wiener, Argentina) and Chagas Test Elisa III (Bioschile Ingenieria Genética S.A, Chile), according to the manufacturer's instructions. Sera with absorption equal to or greater than the cut-off value plus 10% of its value were considered reagent. Positive and negative controls for Chagas' disease were included for the tests.

Hemoculture was performed with 30 ml of venous blood collected in 50 ml heparinized tubes and centrifuged at 4°C to harvest the plasma. The packed cells were washed by centrifugation in 15 ml of liver infusion tryptose medium-LIT at 4°C, resuspended in LIT, homogenized and divided into five 15 ml plastic Falcon tubes, and incubated at 28°C[15]. All tubes were mixed gently once a week and examined monthly for 120 days.

At the same time that patients' blood was drawn for hemoculture, 10 ml was drawn into 50 ml plastic Falcon tubes containing an equal volume of Guanidine-HCl 6M/EDTA 0.2 M (Sigma Chemical Company, USA), pH 8.0 to make polymerase chain reaction (PCR). The blood samples were boiled at 100°C for 15 min, and were then stored at 4°C until use. DNA extraction, the conditions of the PCR reaction and revelation of the amplified products were as previously described[11]. PCR controls were added to each series of samples to establish that carryover DNA contamination did not occur. For each blood sample, extraction and amplification of DNA were performed in duplicate. In order to exclude the possibility that negative results of the PCR were due to the presence of reaction inhibitors, 10 picograms (pg) of previously extracted *T. cruzi* DNA were added to the negative samples that were amplified again.

Treatment: Patients were treated with benznidazole (Rochagan-Roche) at doses of 5 to 7 mg/Kg/day for at least 30 days. Treatment was indicated for patients up to 60 years of age, who generally had good health and wish to receive the treatment.

3. RESULTS

As seen in Table 1 the IIF and ELISA results before and after 4.5 years of treatment showed no variation. The IIF had reduced 2 to 3 titles in six (66.7% - 423; 057; 167; 283; 036; 427) of nine patients 10 years after of treatment, with ELISA remaining unchanged.

Hemoculture was positive for 7 patients before treatment and for none after 4.5 years of treatment, remaining these results for the nine patients in follow-up of 10 years (Table 1).

PCR was positive for 82.4% (14/17) chronic chagasic patients before treatment, for 35.3% (6/17) and 11.1% (1/9) after follow-up therapeutic by 4.5 and 10 years, respectively (Table 1).

Table 1. Laboratory test results from chronic chagasic patients before, 4.5 and 10 years after of etiologic treatment with benznidazol at a dose of 5-7 mg/Kg for at least 30 days

Patient	IIF		ELISA		Hemoculture		PCR	
	Before 4.5/10*		Before 4.5/10*		Before 4.5/10*		Before 4.5/10*	
423	320	160/40	2,000	2.000/2,460	-	-/-	-	-/-
057	160	80/40	2,000	2.000/2,182	+	-/-	+	-/+
167	160	320/40	2,000	2.000/2,861	-	-/-	+	+/-
283	320	320/80	1,782	2.000/3,157	-	-/-	+	-/-
036	320	160/80	1,589	2.000/2,904	+	-/-	+	-/-
427	320	160/40	1,636	2.000/2,862	+	-/-	+	-/-
150	160	80/160	0.996	0,607/0012	+	-/-	+	-/-
218	160	160/80	1,664	2.000/2,256	-	-/-	+	-/-
200	160	320/160	1,808	2.000/2,334	-	-/-	+	-/-
323	40	80/ND	1.611	2.000/ND	-	-/ND	-/ND	-/ND
401	160	160/ND	2.000	2.000/ND	+	-/ND	+/ND	-/ND
411	320	320/ND	1.611	2.000/ND	-	-/ND	+/ND	+/ND
2784	160	160/ND	1.030	1.098/ND	+	-/ND	+/ND	+/ND
367	20	40/ND	1.298	1.327/ND	+	-/ND	+/ND	+/ND
224	320	320/ND	ND	2.000/ND	-	-/ND	+/ND	-/ND
304	1280	640/ND	1.940	2.000/ND	-	-/ND	+/ND	+/ND
139	160	80/ND	1.812	2.000/ND	-	-/ND	-/ND	+/ND

ND= Not done.

4. DISCUSSION

In human Chagas' disease, the problem of adequate parasitologic evaluation has always generated much study and controversy, because negative results do not necessarily indicate a lack of parasitemia or parasitologic cure post-treatment. The effectiveness of drug, the tests used for diagnosis, the characteristics of parasite and of host and the parasite-host relationship are some factors that complicates the evaluation of etiological treatment. To ensure the benefit and build consistent theoretical foundation in applied research is important to systematically monitor, by different and longer periods of time, patients treated, despite of the difficulties inherent in the extended follow-up of subjects in research. The Brazilian Ministry of Health (1997)[16] recommends that to follow up treated chagasic patients, serological tests should be assessed both before and after treatment. In our study, a group of patients was systematically monitored by laboratory analyses before, 4.5 and 10 years after of etiologic treatment.

The hemoculture and PCR results observed with 4.5 years after treatment has not changed after 10 years, consolidating the drug effect with relation to the presence of circulating parasite. As PCR is efficient in detecting low levels of blood parasitism, i.e., this method can reveal the presence of one parasite per 20 ml of blood[17] or as few as 0.1 fg of *T. cruzi* k-DNA[11], a negative PCR result after therapeutic evaluation indicates a reduction in circulating parasites, since the parasitemia is influenced by benznidazole[13,18,19,20]. As the presence of parasite has a pivotal role in the development of the characteristic pathology, the reduction of parasitemia suggests a beneficial action of the drug and an improvement in the patient's prognosis. This was observed for the majority of patients who had positive PCR results before and negative results after treatment, justifying the specific therapy implemented. The failure of all blood samples to yield a positive PCR can be explained by the intermittent presence and variable quantity of circulating parasites at the time of blood collection; i.e., it was possible that parasites were present in one sample but not in another[21,22]; alternatively, changes in the host immune response may have modified the level of parasitemia.

Other results that confirm treatment' benefits is that the number of patients that showed IIF antibody titers of 160 or less ten years after etiological treatment was higher in relation to the number of patients who showed these values before the treatment. Luquetti *et al.* (2008)[23] reported that titers of 160 or lower in treated patients can indicate a tendency toward cure, since these titer levels occur infrequently in patients with untreated Chagas' disease. Fabbro *et al.* (2001)[24] and Streiger *et al.* (2004)[25] have also observed a lower mean of antibody titers detected by IIF for groups of treated patients in relation to untreated patients, and the decline of titers is accepted and recommended by other authors as a sign of cure[23,26]. Reduction in antibody titers and decrease in parasitemia leading to negative parasitological and serological tests was also observed for 100% of the patients at the end of seven years of follow-up[27].

5. CONCLUSION

We concluded that systematic monitoring of patients with Chagas disease performing three methods with different principles and in three different periods of time allows to check benefits of etiological treatment, especially with negative results for high sensitivity method as PCR. Complete evaluation associating these results with clinical data allows accurate assessment of the current condition of patients undergoing chemotherapy. Based on this experience, we recommend therapy with benznidazole, the only drug currently available in Brazil for the etiological treatment of Chagas disease[28], including chronic chagasic patients who show changes in their electrocardiograms and chest X-rays.

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PREVALENCE OF DENTAL ANOMALIES IN CHILDREN AND TEENAGERS FROM A BRAZILIAN NORTHEASTERN POPULATION

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ABSTRACT

Odontogenesis is a complex process that involves a reciprocal interaction between the dental lamina and ectomesenchyma originating from neural crest cells. Failures can occur during this process, causing dental anomalies. We aimed to evaluate, in children and adolescents, the prevalence of dental anomalies. We conducted a clinical-radiographical descriptive, cross-sectional, retrospective study of young patients to evaluate the prevalence of dental anomalies resulting from failures in odontogenesis. Three hundred and four (304) records were analyzed, with 75 anomalies found, distributed among 66 patients. Between the patients with these anomalies 41 (62%) were female and 25 (38%) were male. The most frequent dental anomalies were: agenesis (7.6%), enamel hypoplasia (4.6%), giroversion (4.6%), imperfect amelogenesis (1.6%), supernumerary tooth (1.6%) and root dilacerations (1.6%). According to the affected arch we found the following results: mandible (45.3%), maxilla (32%), maxilla and mandible (22.7%). According to the side affected by anomalies, the data were as follows: left (28.7%), right (24.3%), left and right (46.9%). It was observed a high prevalence of dental anomalies in the studied population, emphasizing the importance of epidemiologic research to recognize the occurrence and characteristics of those lesions in young patients in order to improve Dental Surgeon`s knowledge, since they need to be able to diagnose and treat it.

KEYWORDS: Dental anomalies, pediatric dentistry, orthodontics.

1. INTRODUCTION

In mammals, odontogenesis is a complex process that involves reciprocal interaction between the dental lamina derived from the early oral epithelium and adjacent ectomesenchyme that originates from the neural crest cells[1]. As in any natural course of development, failures can occur during any of the odontogenesis stages, leading to changes or dental anomalies[2]. These changes are common in children and can lead to serious problems if not diagnosed early. The clinical complications by dental anomalies range from speed, eruption disorders, diastema or root resorption, to more serious conditions such as cysts and tumors that significantly change the dentomaxilofacial development of young patients[3].

Among the anomalies of tooth development, there are number, shape, position and structural anomalies[2]. Although its causes are not fully understood, studies have suggested a genetic and hereditary tendency in the etiology of dental anomalies and eruption disorders[4,5]. Therefore, most research in this area seeks to characterize each of the dental anomalies, as seems to be the clear influence of environmental factors and ethnic features in its manifestation[6,7].

Early diagnosis of these changes is essential for planning, treatment and prognosis, and it is indispensable for the success of dental treatment, minimizing stress and costs to patients[8]. Therefore, it is clear the importance of the study and treatment of dental development anomalies since, apart from causing aesthetic discomfort for the patient, such anomalies can create disturbances in the length of the maxillary and mandibular arches and generate malocclusion, complicating the planning of dental treatment especially in the case of orthodontics[9].

Although many of these conditions can be detected clinically and radiographically while the child is still in the stages of deciduous or mixed dentition, little attention has been given to the investigation of these dental anomalies in the young patient. Considering that through an early diagnosis it is possible to prevent the installation of occlusal problems and to improve treatment planning in Orthodontics and Pediatric Dentistry, this study aimed to evaluate the prevalence and distribution of dental anomalies in children and adolescents from the town of Sao Luis - MA.

2. MATERIAL AND METHODS

This research consisted of a descriptive, cross-sectional and retrospective study of young patients to evaluate the prevalence of dental changes due to failures in odontogenesis. The sampling took place in a non-probabilistic convenience way. The research project was submitted to the Ethics Committee of the Federal University of Maranhão (CEP-UFMA), São Luís – MA, and was approved under the Protocol 006794/2011-80.

The population base was established at 1200 dental records of patients treated at the Clinic of Pediatric Dentistry, Federal University of Maranhão (UFMA) and the Specialist Clinic of Orthodontics, Brazilian Dental Association Maranhão section (ABO-MA), from 2007 to 2012. From these records, only 304 were evaluated, considering they measured up to the sample inclusion criteria.

The inclusion criteria for the sample were based on the condition that the records presented complete clinical data of the patient and quality full-mouth periapical or panoramic radiographs that would provide an adequate view of the teeth.

In order to perform the data collection, we used dental records of each chart, duly completed and evaluated by a single researcher. The data collected were noted in a form prepared for this research. The radiographic interpretation was carried out under conditions of adequate lighting under the inverted light a light box, in the dark, with the aid of a magnifying glass.

Studied anomalies and diagnostic criteria

1. Agenesis: absence of one or more dental elements. The definition was based on the age of the individuals and the period in which the initial dental formation should be present on radiographs. Regarding the agenesis of third molars, it was taken into consideration the radiographs of patients over 12 who did not present history of permanent teeth loss and it was considered the missing tooth when there was no radiographic sign of crypt formation. In the case of second premolars, it was considered only the radiographs of patients over the age of eight years.
2. Supernumerary teeth: presence of one or more extra teeth. When one of the teeth was located on the middle line, it was named mesiodens.
3. Macrodontia: when the tooth had a larger size when compared to other elements of arcade.
4. Microdontia: teeth smaller than the standard, when compared to the rest of the teeth.
5. Peg-shaped lateral incisors: were recorded when the incisive mesial-distal length of the tooth crown was less than the cervical width.
6. *Dens invaginatus*: invagination of the crown or root surface before calcification.
7. *Dens evaginatus*: forming an elevation (tubercle) that extends from the occlusal tooth.
8. Gemination and fusion: division of a tooth germ or union of two germs, considered when two teeth appear to be united.
9. Concrescence: root cement joining two or more teeth.
10. Taurodonty: characterized by an increase of the tooth body and a shortening of the roots, with furcations displaced apically.
11. Radicular Laceration: deviation or curvature of the linear relationship between the crown and root of the tooth. Angulation or sharp turn of 90 degrees or more at the root of a developed tooth.
12. Tooth rotation: rotation of the tooth on its own axis. Evaluated through X-rays and confirmed by clinical observations noted in the chart.
13. Defects of development of enamel and dentin: enamel hypoplasia, imperfect amelogenesis and imperfect dentinogenesis; assessed through the dental record data.

Data analysis

A descriptive statistical analysis of quantitative data to determine the means and standard deviations was performed. We used the software *Epi Info*™ 7.1.2 to analyze the prevalence and confidence intervals for qualitative variables.

3. RESULTS

The age of patients studied ranged from 1 to 18 years (mean age was 12 years and the standard deviation was 4.6). Of the 304 records, 164 (54%) were females and 140 (46%) males.

Among the analyzed medical records, it was found that 66 (21.7%) patients had some type of dental anomaly, with 41 (62.1%) being females and 25 (37.9%) males.

Regarding the color of the skin of patients with dental anomalies, 13 were black (19.4%), 12 white (17.9%), 27 browns (40.3%) and 15 who did not have skin color recorded.

In our study we found eleven different types of anomalies, totaling 75 cases distributed among the 66 patients. The proportion of anomalies found was 1:4.6. The prevalence of patients with dental anomalies was 24.6%, as shown in Table 1.

Regarding the diagnostic method used, 23 (30.7%) cases were observed only through clinical examination data (enamel hypoplasia, imperfect amelogenesis and imperfect dentinogenesis, natal teeth) and 47 (62.7%) cases were observed in clinical chart and had a confirmed diagnosis with radiographs (agenesis, supernumerary teeth, mesiodens, peg-shaped teeth, microdontia and giroversion). Finally, only 5 (6.6%) cases were diagnosed only by radiographs (radicular laceration).

Table 1. Prevalence of all dental anomalies found in this population.

Dental anomaly	Number of cases	Prevalence	Confidence interval
Dental agenesis	23	7.6%	4.5% to 10.5%
Enamel hypoplasia	14	4.6%	2.7% to 7.7%
Supernumerary teeth	5	1.6%	0.02% to 3.1%
Mesiodens	2	0.65%	0.02% to 1.5%
Microdontia	2	0.65%	0.03% to 0.09%
Peg-shaped tooth	1	0.33%	0.03% to 0.09%
Imperfect Amelogenesis	5	1.6%	0.02% to 0.3%
Tooth rotation	14	4.6%	2.2% to 6.9%
Radicular Laceration	5	1.6%	0.02% to 3.1%
Natal teeth	1	0.33%	0.03% to 0.09%
Imperfect dentinogenesis	3	0.98%	0.03% to 0.09%
Total	**75**	**24.6%**	**17%** to **26.3%**

According to the affected dental arche, 45.3% of the anomalies were found in the mandible, 32% in maxilla and 22.7% in both arches. Regarding the affected side, 46.9% of patients had both sides affected by anomalies, 28.7% showed anomalies only on the left side and 24.3% on the right side.

The studied patients had a number of teeth affected by dental anomalies ranging between 1 and 28, each patient had an average of 2.84 affected teeth. Most patients had only one (54.5%) or two (28.7%) teeth with anomaly or extra teeth.

The tooth agenesis was the most prevalent abnormality in the sample, affecting some dental groups (Figure 1).

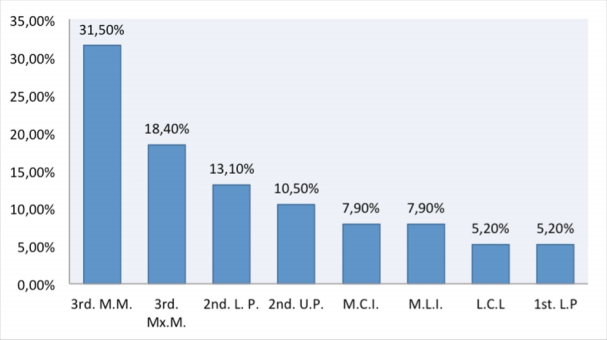

Figure 1. Frequency of agenesis in dental groups.
M.M: mandibular molar; Mx.M: maxillary molar; L.P: lower premolar; U.P: upper premolar; M.C.I: maxillary central incisor; M.L.S: maxillary lateral incisor; L.C.I: lower central incisor.

We tabulated the distribution of agenesis according to the number of affected teeth and the gender (Tables 2 and 3, respectively).

In this sample, it was found that the number of anomalies represented by agenesis and supernumerary teeth were the most prevalent. Followed by anomalies represented by enamel hypoplasia, imperfect amelogenesis and imperfect dentinogenesis. The hypoplasia affected 14 patients, totaling 30 teeth. The most affected teeth were central incisors and canines, followed by lateral incisors and first molars.

Table 2. Distribution of the number of teeth agenesis by patients.

Number of agenesis	Number of Patients	Total agenesis
1	14	14
2	6	12
3	2	6
6	1	6
Total	23	38

Table 3. Distribution of agenesis according to gender.

Gender	Number of subjects with agenesis	Prevalence of subjects with tooth agenesis
Female	14	4,6%
Male	9	2,9%
Total	23	7,5%

Among the position anomalies, we observed 14 (18.6%) patients with tooth rotations, totaling 22 teeth. Regarding the extra teeth, the prevalence of supernumerary teeth was 1.60% and 0.65% of mesiodens.

4. DISCUSSION

Currently, many researchers, especially in the area of Orthodontics, have paid attention to dental developmental anomalies in order to uncover their causes, given that these can cause various clinical complications[9,10]. However, we observed differences between epidemiological studies. These conflicting results may have been given due to geographical and phenotypic differences and sampling techniques used, given that studies have researched different types of dental anomalies[11,12]. The differences can also be explained by influences of the local environment and the nutritional status of patients[13,14].

The prevalence of patients with dental anomalies found in this population approaches the results found in a study developed by Libério *et al.* (2002)[13] at another treatment center in São Luís - MA. However, it differs from that found in a survey conducted with students from Rio de Janeiro - RJ[7] and 4-12 years-old children from Niteroi - RJ[12], where the prevalence was 11.9 % and 11.4 %, respectively. Yet, in surveys conducted in Turkey the prevalence ranged from 5.46%[14] to 40.3%[15]. We believe that the high prevalence of dental anomalies found in this study may have been given because the samples were collected in reference centers in Orthodontics and Pediatric Dentistry, in which complaints related to the consequences of the anomalies are common. We also emphasize that while some studies have reported data only through imaging studies[7,12], this research conducted a clinical and radiographic study, justifying a higher prevalence of anomalies found.

Regarding gender, there was no statistically signifi-

cant difference (p = 0.074). This value is close to those found by Coutinho *et al*. (1998)[12] and Altug-Atac & Erdem (2007)[14]. This fact makes us believe that probably the dental anomalies are not associated with gender.

We noticed that the jaw was the most affected dental arch. This result differs from the values found by other studies[11,12,14,15] in which the maxillary arch was the most affected by the anomalies. This result may suggest a genetic difference of the affected population, with greater predisposition to dental anomalies in the lower jaw.

According to the affected side, the prevalence of abnormalities was higher on both sides, disagreeing with the findings of Coutinho *et al.* (1998)[12] who found a greater prevalence of the anterior superior region; however, these authors did not report if both quadrants were affected. Furthermore, Küchler *et al.* (2008)[8] also found greater bilateral occurrence of dental anomalies. This result can be explained by the odontogenesis, since the teeth of the same group are formed simultaneously on both sides[2].

The agenesis or absence of dental elements has been the subject of several studies around the world, where it has been shown that genetics probably is the primary etiology of these anomalies[4]. This anomaly was the most prevalent in the studied sample. A result that confirms the data found in the literature[7,11,12,15,16]. The differences in the prevalence of each study can be justified by the phenotypic characteristics of each population. In African and Australian groups, for example, the prevalence of Hypodontia is 1%, while in Japanese groups it is 30 times higher[16].

Regarding the teeth most affected by agenesis, third molars were those who had the highest prevalence, especially mandibular third molars, followed by the upper and lower second premolars. These results corroborate those found by Borba *et al.* (2010)[17] in Campo Grande - MS, Costa *et al.* (2007)[18] in Sao Paulo - SP and the findings of Altug-Atac & Erdemb (2007)[14] for the third molars and premolars, respectively. However, the study of Borba *et al*. (2010)[17] only researched the prevalence of agenesis of third molars, while this study compared it with agenesis of other teeth.

The teeth most affected by dental agenesis were exactly the posterior dental groups of terminal elements (third molar and second premolar). This can be attributed to a phylogenetic evolution, and third molars have a strong tendency to disappear in future generations[17].

In Brazil, dental anomalies of structural type are poorly studied, although they lead to aesthetic problems, dental sensitivity and may be predictors of dental caries[19]. After the dental agenesis, anomalies of the structural type were the most prevalent in this population, and enamel hypoplasia was the most common one. These data are similar to those found in the literature[19-22]. We should emphasize that some studies evaluated only primary teeth and other assessed both the primary dentition as the mixed and permanent.

The primary teeth were the elements most affected by enamel hypoplasia in this sample. This finding is similar to those found by Pinho *et al.* (2011)[21]. However, unlike the findings of Li *et al.* (1995)[22]. We can explain this difference by variations in environmental factors surrounding each population, such as nutrition. Furthermore, the fact that deciduous teeth have been more affected by hypoplasia can be explained by the chronic vitamin deficiency during pregnancy (where these teeth are being formed), particularly of vitamin D, which is the most common cause of enamel defects. Vitamins A and C are also related to the enamel hypoplasia[21].

Still regarding structural dental anomalies, the prevalence of imperfect amelogenesis was low; the same result was observed by Altug-Atac & Erdem (2007)[14] in a Turkish population. Among the position anomalies, the most prevalent was tooth rotation. The same was observed by Armond et al. (2008)[8], but it differed from that found by Teixeira *et al.* (2008)[6]

In concern to the supernumerary teeth, adding to mesiodens, there was a prevalence similar to that found in a survey conducted by Moura et al. (2013)[23] in Teresina - PI. The results also are close to those found by Armond *et al.* (2008)[8], Girondi *et al*. (2006)[11] and Coutinho *et al* (1998)[12].

The results of this study are similar to those of Uslu *et al.* (2009)[15] and Coutinho *et al*. (1998)[12], regarding the root lacerations. However, it differs from Teixeira *et al.* (2008)[6], which probably occurred due to the difference between the mean age of the patients, which was higher in the latter study (mean age = 16.16) and indicates the presence of a larger number of evaluated teeth to root laceration.

We found only one case of peg-shaped tooth and natal tooth. Unlike other researches[7,10,14,15], we found no cases of macrodontia, concrescence, gemination, fusion, *dens invaginatus*, *dens evaginatus*, enamel pearls and taurodontism.

We noticed that some results differ from those reported in the literature. There is a wide divergence in methodologies employed. This makes us suggest that other studies be conducted involving young populations non-specific from dental services and greater standardization in research methods, so that they can make inferences that help elucidate the real prevalence and etiology of dental development anomalies, in order to contribute to their treatment and its complications.

5. CONCLUSION

This study demonstrated a high prevalence of dental anomalies in the studied population, especially dental agenesis and enamel hypoplasia, which frequently leads

to undesirable aesthetic and functional consequences for the patient. Thus, the epidemiological research is fundamental to determine the occurrence and characteristics of dental anomalies in young patients, which provides for orthodontists, pediatric dentists and clinical dental surgeons general information that assist in the diagnosis and treatment of these disorders.

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MICROBIOLOGICAL AND PARASITOLOGICAL EXAMINATION OF WATER FROM VALE VERDE DISTRICT, MINAS GERAIS, BRAZIL

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ABSTRACT

Noticing the importance of the water potability to the public health. Our group has taken the initiative to the develop a research projectand test the water from Vale Verde district, with the purpose of determinate the quality and check its potability, enabling the district population the knowledge of the daily consumption of water which is used to recreation and food cultivation. Thus, our study determinates the action to be made, with the purpose of educate the people about the importance of sanitary education, aiming to preventing several diseases, whose transmission happens through drinking contamined water by bacteria and parasites.

KEYWORDS: Test, Potability, Water, Microorganisms.

1. INTRODUCTION

Water is an essential substance for the development of life. It represents approximately 70% of the body weight of a human being, participating in several physiological functions of the body, and is considered a universal solvent because it is possible to dissolve a large amount of substances[1].

In these contexts, water is essential for the maintenance and development of life and the best method to ensure their quality for consumption is to avoid contamination with animal waste and human, which can contain large variety of bacteria, viruses, protozoa and helminths. Failures in effective treatment and protection expose the community to the risk of contracting intestinal parasites and other infectious diseases[2].

Consuming contaminated water that does not meet the potability standards, creates risk factors and health problems to human health. The water can be harmful when you have pathogens and chemicals that can be harmful to the body, triggering diseases[3]. To consider potable water, the physical, chemical and microbiological parameters shall be in accordance with Administrative Rule N. 2.914 of December 12, 2011 the Ministry of Health of Brazil, which provides control procedures and quality surveillance water for human consumption and its potability standards[4].

Groundwater may be removed from artesian wells, which are relatively impermeable, making it difficult to contamination or be removed free wells that are near the surface and more susceptible to contamination. The tanks are used due to their low cost drilling. In Vale Verde district, the health unit, dental clinics, schools, restaurants, bars, cafeterias, food products industries, and private homes, use the water collected in shallow wells, it is treated inadequately, without knowledge of their quality bacteriological and parasitological. All respondents use water for drinking, cooking and bathing.

Almost 100% of the final destination of the sewage generated in the district are the pits, the "open air" or cast into the stream that cuts through the district. These actions contribute to the contamination of groundwater by pathogenic microorganisms and/ or harmful substances and chemicals the health of residents.

The general objective is through microbiological parasitological analysis is to determine the quality of water used for drinking, recreation and food cultivation in the Vale Verde district, Mina Gerais, Brazil. As a specific purpose it is intended, as soon as the outcome, determine initiatives to be taken to mitigate potential contamination of the population. In case of being unfavorable, inform the public and instruct there measures to be taken in order to improve the quality of water they consume, and alerting agencies and authorities so that action is taken.

2. MATERIAL AND METHODS

It was evaluated water from Vale Verde district, located in the State of Minas Gerais, Brazil. The same has 2088 inhab. in an area of 28.0 km^2, density of 74.57 inhab./ Km^2 according to the 2000 Demographic Census

(IBGE).

Data relating to the characteristic of the wells were obtained through household surveys, with the application form prepared with closed questions. Data on water quality were obtained by bacteriological analysis (describing the presence or absence of coliforms total/ fecal-thermotolerant, among other bacteria), and parasitological analysis (to identify larvae, trophozoites, cysts and parasites eggs). Water quality was evaluated by results obtained in bacteriological analyzes, compared with the values recommended in Administrative Rule N. 2.914 of December 12, 2011 the Ministry of Health of Brazil.

Eight samples were taken at different points, all samples were collected in sterile jars (sterilized by autoclaving) without manual contact and/ or any contaminant, and were taken to the laboratory for analysis. Samples were analyzed for microbiological character and parasitological aiming the characterization of the presence of total fecal coliforms, and cysts, trophozoites, eggs and larvae of parasites. Each sample was analyzed separately by the same methods. For microbiological analyzes were used the method of chromogenic substrate using as Colilert® reagent. To carry out the parasitological analysis was used Hoffmann Method, Pons and Janer (Lutz) (spontaneous sedimentation).

3. RESULTS

We found that 62.5% of households consumed water did not receive any treatment. Having originated from shallow wells 75% excavated manually, up to 20 meters deep 37.5%, which raised the water was made by pumping 87.5%. We highlight the percentage of households where the distance between the well and the closest pit is less than 10 meters 37.5% (See Table 1).

Table 2. Characteristics of wells where water samples were collected for laboratory analysis in the Vale Verde district, Ipaba - MG, 2014.

Characteristics	%	Total
Type of water well		
Manual excavation	65.5	5
Drilling with drill	25	2
Unknown	12.5	1
Well´s depth		
Up to 5 m	12.5	1
5-10 m	25	2
10-20 m	37.5	3
Over 20 m	25	2
Type of water harvesting		
Pumping	87.5	7
Manually	12.5	1
Distance between the well and the nearest septic tank		
5 – 10 m	37.5	3
10 – 20 m	12.5	1
over 20 m	37.5	3
Unknown	12.5	1

As for the final disposal of domestic sewage from households where the survey was conducted, 50% intended in tanks and 50% in river (See Table 2).

Table 2. Origin of the water, pretreatment and disposal of sewage in the Vale Verde district, Ipaba - MG, 2014.

The water used for human consumption receives pre-treatment?		
Yes	37.5 %	3
No	62.5%	5
Water source used for human consumption		
Yes	75%	6
No	25%	2
Domestic sewage Disposal of		
Yes	50 %	4
No	50%	4

Analyzing the microbiological content of the samples, it was found that 100% of the samples were contaminated by fecal coliforms and total, in 37.5% of samples found the parasites: *Giárdia lambia, Entamoeba histolytica*, and *Entamoeba coli;* 25% *Isospora belli;* 12,5% were identified parasites *Balantidium coli*, *Strangyloides stercoralis* and *Entamoeba sp*.

Table 3: Distribution of parasites found in the Vale Verde district, Ipaba - MG, 2014.

Local	**Found parasites**
Sample 1	*Entamoeba histolytica; Giárdia lambia*
Sample 2	*Balantidium coli; Entamoeba coli; Entamoeba histolytica* *Giárdia lambia; Isospora belli; Strangyloides stercoralis*
Sample 3	*Entamoeba histolytica; Entamoeba sp; Giárdia lambia; Isospora belli*
Sample 4	*Entamoeba coli; Entamoeba histolytica*

4. DISCUSSION

The wells studied were superficial, shallow type, drilled manually, located in unconfined aquifer, located up the bedrock. In the study all samples contained the presence of coliform bacteria, indicating that the water is unsafe for human consumption. The presence of fecal coliform bacteria indicates the possibility of contamination by feces and therefore pathogenic microorganism.

5. CONCLUSION

Water contamination of groundwater located in the Verde Valley District Minas Gerais, Brazil is proved by the results of microbiological and parasitological analysis of water samples collected in the district wells. The water does not meet the potability standards recommended in Administrative Rule 2. 914 of 12 December 2011, of the Ministry of Health of Brazil. Thus, the consumption of water is a risk factor to health. It is necessary to evaluate the quality of groundwater in other areas of the district, as on-site consumption of groundwater is high and widespread.

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THE USE OF BOTULINUM TOXIN TYPE A IN THE CORRECTION OF THE GINGIVAL SMILE

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ABSTRACT

In the case of Smile Analysis, it is indisputable that excessive gingival exposure is considered one of the main reasons for the pursuit of aesthetic correction by patients. A full evaluation of all the factors involved is needed in the labial resting position and smiling, so that the complete diagnosis is made. Botulinum toxin has been described with an important ally in the gummy smile correction. Objective: The aim of this study is to report the use of botulinum toxin type A in the gummy smile correction, in 10 patients randomly selected, of both genders aged 18-35 years. Methods: The application was done at the Faculty Inga / Uningá, in two stages, an initial and another 15 days after the first application. The patients were selected and photographed in frontal facial analysis in these two stages, and subsequently compared. The sample consisted of patients with greater than 3 mm gummy smile and the sample selection criteria were: no patient could present subcutaneous graft as hyaluronic acid or have performed toxin application within 120 days. Botulinum toxin type A was applied on the nose wing levator muscle at a dose of 2 units per side. Results: After application, there was significant reduction in the elevation of the upper lip while smiling, greatly improving the aesthetics late patients smile in all cases. Conclusion: At the end of this study, it is concluded that botulinum toxin type A, is an excellent alternative for reducing the gummy smile.

KEYWORDS: Gingival smile, botulinum toxin type A, Botox

1. INTRODUCTION

The use of botulinum toxin is a main used alternatives to the aesthetic treatment in the medical field and are not widely used in the dental aesthetic treatment. However, this reality is changing, after the liberation of Federal Council of Dentistry (CFO), for the use of botulinum toxin for therapeutic purposes. Among the many approaches to this treatment are related: the treatment of temporomandibular disorders, orofacial dystonia, bruxism, masseter hypertrophy, facial asymmetries muscular origin and gummy smile[2,3,5].

Considered to be acceptable to smile, a gingival display up to 2mm and above that, the aesthetics would be compromised especially for females; exposure above 4 mm considered very unpleasant[1,4].

One of the etiological factors of gummy smile is lip of mobility caused by hypertonicity of the muscles involved in smiling that would be the muscles: Orbicular the mouth, upper lip lift, nose wing elevator, corner of the mouth lift, zygomatic major, minor zygomatic, depressor of the nasal septum[6].

According to Peck et al., Patients with gummy smile have 20% more capacity of the facial muscles to raise the upper lip while smiling when compared to other patients[7]. Several correction methods for gummy smile have been proposed, such as gingivoplasty, orthodontic treatment indicates tion of intrusion of upper incisors; orthognathic surgery to impaction of the maxilla; and bone resection[8]. These procedures are of varying complexity, high cost and generally have long treatment time. Thus, a minimally invasive treatment modality that can serve as a substitute for the surgical procedure, namely the use of botulinum toxin (BTX) has been suggested[11]. Use of botulinum toxin type A could become an option, to be a simple, rapid, reversible and effective for aesthetic correction of excessive gingival exposure when smiling[10].

2. MATERIAL AND METHODS

The cases presented in this study are patients with more than 3 mm gingival display during smiling posed, of both genders, different ages. Treatment elected to minimizing the gummy smile was the application of BTX-A in the upper lip elevator muscles and nasal wing,

bilaterally and in the depressor muscle of the nasal septum. The precise location of the application site was determined by animation muscle (during the smile) and palpation of twitch before injection. 10

To assistance of diagnosis were made extraoral pictures with the camera rebel XT Canon brand before application and after 15 days. Insulin syringe was used 30 units needled.

The botulinum toxin used was the trademark Dysport^{R}, (300 U, Lab. IPSEN) reconstituted in sterile saline 1 ml per vial. We selected the lateral point the nose of the wing, and two units applied bilaterally.

3. RESULTS

After 15 days after the application of botulinum toxin type A in the levator muscle of the upper lip, with 2 units on each side, it was found extremely satisfactory result, considerably reducing the contraction of this muscle, and improving the appearance of gummy smile in 10 patients sample, without exception (Figures 1 up to 10). This result remained stable for four months on average and, after this period, patients reported a recovery of the initial configuration of the smile, given that the toxin is not a permanent substance.

The following illustrate the extraoral smiling frontal photographs of patients who received treatment with toxin at two times: before and 15 days after.

Figure 1. PATIENT 1. Photography before the application of the toxin (above) and 15 days after application of the toxin (below).

Figure 2. PATIENT 2. Photography before the application of the toxin (above) and 15 days after application of the toxin (below).

Figure 3. PATIENT 3. Photography before the application of the toxin (above) and 15 days after application of the toxin (below).

Figure 4. PATIENT 4. Photography before the application of the toxin (above) and 15 days after application of the toxin (below).

Figure 6. PATIENT 6. Photography before the application of the toxin (above) and 15 days after application of the toxin (below).

Figure 4. PATIENT 4. Photography before the application of the toxin (above) and 15 days after application of the toxin (below).

Figure 7. PATIENT 7. Photography before the application of the toxin (above) and 15 days after application of the toxin (below).

Figure 8. PATIENT 8. Photography before the application of the toxin (above) and 15 days after application of the toxin (below).

Figure 9. PATIENT 9. Photography before the application of the toxin (above) and 15 days after application of the toxin (below).

Figure 10. PATIENT 10. Photography before the application of the toxin (above) and 15 days after application of the toxin (below).

4. DISCUSSION

Botulinum toxin is produced by *Clostridium botulinum* bacteria. There are seven distinct forms neurotoxin ranging from Type A to G, with type A (BTX-A) being most commonly used for therapeutic reasons. "Botox" (Allergan, Inc., USA) is the trade name of botulinum toxin type A first approved for cosmetic and therapeutic use, which is why this is the most remembered product.

Botulinum toxin (BTX) is a protease that causes temporary chemical denervation of skeletal muscles by blocking the release of acetylcholine-mediated Ca + ² the nerve endings of alpha motor neurons and gamma (myoneural junction), producing a dose-dependent weakening, temporary muscle activity becoming non-functional muscles without systemic effects. However, it is believed that the muscle begins the formation of new acetylcholine receptors. When the terminal axon begins to form new synaptic contacts, there is a reestablishment of neuromuscular transmission and gradual return to full muscle function, usually with minimal side effects[3].

The CFO, permitted the use of botulinum toxin in 2011 according to CFO-112 Resolution of 02/09/2011 that subscribe below:

Article 1°. The article 2º, CFO-112 resolution of

09/02/2011, published in the Federal Official, Section 1, page 233, on 09/05/2011, as amended by CFO-145 resolution of 27/03/2014, published in the Federal Official, Section 1, page 174, on 14/04/2014, becomes effective with the following wording: "Article 2º. The use of botulinum toxin is allowed to dental procedures and sealed for non-dental purposes".

Article 2°: This Resolution became effective on the date of its publication in the Official lmprensa, all provisions to the contrary (CF0, 2011)[12]. In the dental office, as Couto (2014)[12], the most common application is in the treatment of bruxism, gummy smile and dysfunction that affects about 30% of Brazilians. When applying the toxin, the involved muscles undergoes a "relaxation" improving the condition of muscular hypertonicity in the region[12].

The gummy smile is conceptualized by exposure of more than 3 mm of gum tissue for smile and its etiology is multiple and may be involved: vertical excess of maxilla late passive eruption, hyperfunction of the muscles involved in smiling and reduced length of the clinical crown of the tooth[8,9,11].

The gummy smile caused by muscle hyperfunction was nominated for botulinum toxin, being the treatment of choice for ease and security of applications, rapid effect, as well as being a more conservative method compared to surgical procedures[4,8].

Each muscle involved in raising the upper lip has a function during Smile activity. The sites for the injections are determined by the contraction of specific muscle groups and is the main muscle involved, and upper lip lift. Applications are usually made laterally to bridge of the nose with low-dose toxin type A (two units/ side).

5. CONCLUSION

According to findings and research presented here, we conclude that botulinum toxin type A, is an important ally in the treatment of patients with gummy smile of muscular origin, significantly reducing the contraction of the upper lip levator muscle, and improving the facial aesthetics patient.

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MUCOUS BULLOUS PEMPHIGUS ASSOCIATED WITH PARACOCCIDIOIDOMYCOSIS – APPROACH OF A CLINICAL CASE

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ABSTRACT

The etiology, pathogenesis, clinical characteristics and treatment are different both in mucous bullous pemphigus and in paracoccidioidomycosis (Pcm). Stands out, in the dental practice, the fact that it can simultaneously be part of a clinical picture of a patient. The woman, 61 years old, residing in a rural area in the northwest of Paraná, with widespread ulcerations in the mouth, noted pain symptoms, and medical history of hypertension frame, depression and multiple previous drug treatments. With consequent surgical-estomatological treatment, was held a biopsy, resulting the pathology report of Mucous Bullous Pemphigus associated with Paracoccidioidomycosis. It was proceeded a drug therapy aimed at the cure of the first lesion and a forwarding to the Pulmonologist, considering that the second injury has its primary source in the lung. It is noteworthy that both diseases require treatment time to obtain resolution of the pathological processes.

KEYWORDS: Mucous Bullous Pemphigoid; Paracoccidioidomycosis; autoimmune disease; granulomatous disease.

1. INTRODUCTION

Pemphigus Bullous Mucoso ((Pbm) is an autoimmune disease[1,2,3,4] fleeing the conventional control diagnosis. The complexity therapeutic, making it difficult to deal with the prognosis that can be good for curing and be bad in relation to the fact that there will be periods of remission and exacerbation of the disease; and also have side effects that can lead to other complications due to weakness of the patient and secondary infections[4,5].

In Pbm IgG immunoglobulin reacts against desmoglein type III is a glycoprotein of desmosomes, which promotes the connection between cells. Once the desmosome being hit by the antibody, it falls apart causing acantholysis and these cells will be separated from neighboring cells will be engaged by the resulting liquid separation between them where the clinical feature of pemphigus will be observed that there is a bubble[2,4,5].

Whereas this fluid collection will be broken, will have exposure connective tissue that will be one of aggravating already cited[3,7].

This condition is more aggressive is the fact that they are both associated with another disease. Considering that this disease the Pcm will result in an association where a chronic and insidious disease process aggravate entire therapeutic procedure.

The Pcm reveals a picture that involves addition of the oral mucosa lympho-hematogenous the spread of the fungus to other organs, mainly and normally the lungs[5], which is diagnosed in time, it and having a prolonged treatment the prognosis is favorable[7].

Because the pathogenicity of *Paracoccidioides brasiliensis* fungus in the pulmonary involvement, there will be granulomatous lesions, characterized by the involvement of the fungus by the defense cells, like macrophages, giant cells, epithelioid cells, showing the chronic nature of this aggression where there will be continuity of Pcm to be aborted by drug treatment[8].

This granulomatous disease is endemic in the northwest of Paraná[9] affecting mainly individuals who are involved in the countryside. The fungus has its habitat on earth, and when the airways invades the host, there will be established that one infection at a time of low immunity will be established disease, where the fungus will become aggressive causing morbidity of the case. Men are mainly affected; not women, because they possess a hormone estradiol, which prevents budding fungus which establishes the disease and its aggressive development[7].

These injuries can be framed, the pemphigoid in any genre in the Pcm male and the female when it reaches menopause. Both are independent of ethnicity, and may be located in the oral region and the Pbm extended dermatologically and Pcm primarily lung[7,1].

When addressing this clinical study highlights the existence of Pbm and Pcm simultaneously on the patient and the environment in the dental practice and the multi-

disciplinary treatment of doctor and dentist.

2. CASE REPORT

Female patient, 61 years old, leucodermic, residing in a rural area in northwestern Paraná State, referred by a physician for diagnostic evaluation and treatment, according to him, a leukoplakia in tongue, buccal mucosa and lip lower, four years ago (Figure 1). Forwarded the Dental Clinic of the Faculty Inga, to dental assistance, for the patient reported that at the beginning the lesion appeared, lasted a while and disappeared to almost disappear. In addition, he has made several medical examinations, and used them Zinnat and Bactrim medication for 30 days and did not feel improvement. According to his words, these lesions began with a very bad cold, fever and nervous breakdown and never completely disappeared.

Figure 1. Clinical aspect of the lesion on the right jugal mucosa.

The patient presented packaging of drugs (losartan and hydrochlorothiazide) that was in her handbag reporting know why its continued use, for ten years. In recent days, for self-medication, because of pain, used spray hexomedin, drops of tetracaine and finally Gentian Violet.

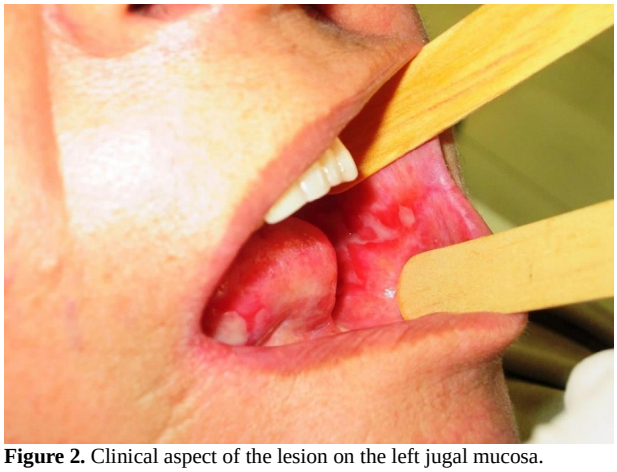

Figure 2. Clinical aspect of the lesion on the left jugal mucosa.

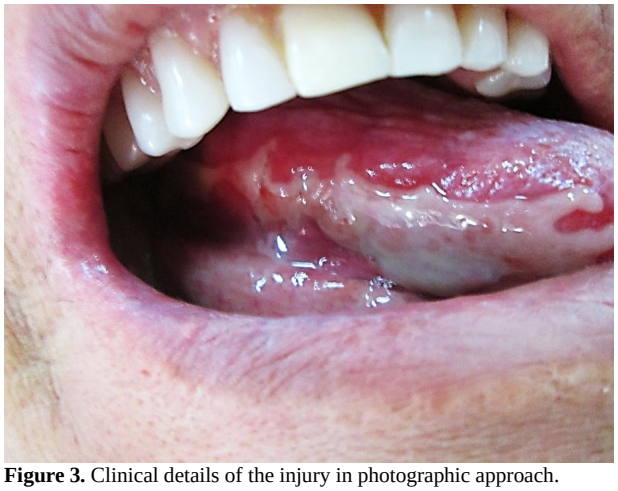

Figure 3. Clinical details of the injury in photographic approach.

Even after 30 days, when the patient reported that took Bactrim, the Emergency Unit reported that it continued making use of sulfa. In clinical examination, there were generalized ulcers in the oral mucosa associated with painful state (Figure 2, 3 and 4). There was an obvious confusion in an attempt to frame the patient explain what happened to her, what and how used his drugs.

Figure 4. Presence of ulceration in tongue.

A biopsy was performed on the buccal mucosa and the right side of the tongue (data not shown). The report was inconclusive, linked to the observation of the pathologist who showed intense presence of lymphocytes, and ulceration and with the absence of neutrophils, was routing to an autoimmune disease. Due to be all ulcers had no way of associating the supporting tissue with the tissue lining.

Based on the diagnosis, started a drug treatment with corticosteroids, prednisone 20 mg, starting in two tablets every morning in the first five days, a tablet following twenty days and concluding half tablet in the past five days. There was a significant improvement of symptoms with clear patient satisfaction.

About 60 days after the first biopsy, it was decided

by a second in the face now have areas with coating fabrics and less ulcerations. This time the result of microscopic examination was pemphigoid associated with Pcm.

It was prescribed again and likewise the corticosteroids and the patient were referred to a pulmonologist for evaluation of infection, and as a result can be established, a multidisciplinary approach aimed at healing of oral and lung injuries.

3. DISCUSSION

The Pbm and Pcm are pathological processes that lead to a state of prostration, just as in the presented patient, both the clinical picture, as the damaging and debilitating effects of the drugs and in use. First the important clinical pemphigoid with generalized ulceration of the oral cavity and secondly, by suspected of having lung lesions from fungal infections which lead to a weakened state.

She knew from the Pcm in patients after diagnosis of the pathology lab report because, until now, the vision therapy was concentrated in pemphigoid. Considering its simplicity and financial condition, has made up the assistance with the pulmonologist of Regional Emergency Unit, where the disease was confirmed by radiographic evaluation, beginning by the doctor systemic treatment.

This diagnosis of PCM is derived from his residence always be in rural areas and have the age of 61 years. These data reinforce the thought in favor of the disease, therefore, the etiological agent has its habitat in the soil 7 and pulmonary route reaches the host becoming infectious by falling immunity. The female hormone estradiol prevents the budding of PB preventing the disease, but the age of the patient reveals that his estrogen rate is not enough to protect it physiologically. It is clear that other factors are determining factors for the development of injury such as the reduction of estradiol appears to be one.

The pemphigoid reinforced by being associated with the state of stress in which the patient reported having depressive episodes, and can be triggered by several drugs, of which it makes use of sulfonamides and losartan[12].

Neville (2004)[4] and Regezi (2000)[10] suggest a derivative of Sulfa in order to be used as an alternative therapeutic agent for pemphigoid, but we must consider that this is a stimulant drug that autoimmune injury[5].

Medicines available to the Emergency Units for the treatment of Pcm are based on Sulfa drugs 1, drug this it might not be available to the patient therefore exacerbate their oral lesions, a fact, resultant from the prescribing of pulmonologists, Itraconazole by taking one capsule after lunch for 12 months.

Can relate to Munchausen Syndrome[11,12] to report the case, first by the ratio of the drugs presented, Bactrim, Zinnat, Losartan, hydrochlorothiazide, hexomidin, citalopram, tetracaine and Gentian Violet, then the report with some precision diseases and symptoms had. Unlike other patients, it does not alienated any biopsy request, which would be normal to expect a seizure board and curious to know the result. A representative given to this thought is to condemn the Bactrim be able to be associated to their ulcerations in the mouth and the same make and not report us, that is, seems to be willing to cause lesions.

4. CONCLUSION

In a review can be concluded need of treatment of patients with Pbm, especially where a clinical generalized ulceration of the oral cavity is shown, where it gives rise to painful symptomatology with consequent difficulty for the state of weakness and lack of nutrition.

Emphasizes the complexity of giving likely diagnoses, because in clinical view ulcerations can be framed in pemphigoid, pemphigus vulgaris, erosive lichen planus, erosive candidiasis, allergic reactions or trauma. Added to the fact that history is always subjective, making it difficult to select or understand the information provided when not clear the patient.

Biopsy in ulcerative lesions implies the difficulty between the surgeons does not have the perspective of the pathologist and the other way around. That is, the surgeon would have to think to remove the fragment is no need to have fabric covering and support and the pathologist would have to think about the difficulty of the surgical procedure which would produce inconclusive results.

We point out that, as with the pathological diagnosis in hand, the operation of the treatment becomes feasible, because it is almost exclusively laboratory and continuous drug, with the possibility of hospital medical care due to granulomatous disease picture sue about a year or more for its resolution; the pemphigoid may require months to display periods of remission and exacerbation.

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HYPERFUNCTION PREVIOUS SYNDROME: CASE REPORT

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ABSTRACT

Patients upper denture wearers and Partial Prosthesis Removable bottom (Kennedy Class I) may have the Hyperfunction Previous Syndrome also known as Combination Syndrome or Syndrome Kelly. This syndrome was described by Ellisworth Kelly in 1972 and has very striking features. Different treatment proposals were presented and described over the years and they all converge to the adverse effects of previous contact between the lower natural teeth or prosthesis type protocol and artificial teeth of dentures. Considering that this association may be one of the factors triggering the combination syndrome, this study aims to demonstrate the clinical features and present a form of treatment through a clinical case report returning function, phonetics and aesthetics for the patient.

KEYWORDS: The previous hyperfunction syndrome, dentures, natural teeth

1. INTRODUCTION

The alveolar bone resorption is a process which inevitably follows after extraction of natural teeth. This process can be accelerated by the use of removable prostheses or even aggravated when they are prepared or used improperly. As well as the sharp decline in bone tissue in the anterior region, the uncontrolled growth of the mucosa and the posterior alveolar bone interferes unfavorably implementation and prognosis of new prostheses[1].

Many of these patients present with five changes observed by Kelly and dictated by this syndrome: bone loss in the anterior region of the upper edge, extrusion of the above natural teeth, increased jaws tuberosities, bone loss from the posterior region of the lower arch under the Removable Partial Prosthesis (RPP) base removable and papillary hyperplasia of the hard palate mucosa. Kelly was the first to make such observations and reports that bone loss of anterior maxillary portion is the key to the other syndrome changes[2].

In the long term, this situation often results in an occlusal instability which, if not corrected, can lead to progressive atrophy of the mandibular posterior alveolar ridge. This process has a slow evolution and most often is unnoticed by the patient and also for professional, so perpetuated[3].

Various forms of treatment are proposed for the combination of the syndrome: dental implants in the jaw for greater stability of the prosthesis when there is enough bone; implant-retained prosthesis, for stability of the occlusion and reduction of previous occlusal forces; overdenture mandibular and maxillary [4].

This syndrome is the potential iatrogenic stomatognatic system, especially to dental support structures and mucus-bone, as well as the temporomandibular joint according to the occlusal imbalance and instability (s) of the prosthesis (s). Therefore, diagnosing the syndrome and determine the appropriate treatment to the patient's needs may stop the destructive process, creating clinical conditions for the restoration of health[5].

Theoretically, the most appropriate therapeutic measures to stop the deterioration factors and self-support of the prior hyperfunction syndrome would be the maintenance of the bone supporting the pre-jaw by placing implants and stabilization of the support at the ends mandibular free using in the same manner the implants. In cases where bone resorption is so advanced that does not allow the placement of implants would consider using other solutions improving the bone support, combined or not with the placement of implants[6].

In trying to establish an appropriate treatment to minimize the effects of the syndrome, one can highlight the cited by Herman *et al.* (1993)[5], who reported the placement of implants to support the RPP lower. This alternative eliminates the free end preventing vertical and lateral movements responsible for accelerated bone resorption below the resin base PPR5 already Ahmad & Yunus (2008)[6] emphasize the use of a different casting technique, together with a prosthesis design and appropriate occlusal scheme as a way to mitigate the problems arising from the combination syndrome, and Tolstunov

(2009)[7] suggests the use of dental implants for both the maxilla and for the mandible as an alternative treatment.

This study aims to demonstrate the clinical features and present a form of treatment through a clinical case report, restoring function, phonetics and aesthetics for the patient

2. CASE REPORT

Patient, 60 years old, male, sought the Dental Clinic of the University Severino Sombra, Vassouras - RJ, and as main complaint reported that their implants were falling in speaking and would like to change them. Intraoral clinical examination, the patient was diagnosed with Previous Hyperfunction Syndrome as they have been observed some signs for such a diagnosis as the presence of the lower teeth 31, 32, 33, 35, 41, 42 and 43, the presence of upper dentures the mucosa of the anterior jaw slack and the extrusion of the lower anterior teeth.

Figure 1. Initial frontal and side smile

Figure 2. Initial intra oral aspect

Figure 3. Mucosa of the maxillary and extrusion of the lower teeth.

After collecting initial data, the patient was asked about the possibility of treatment, which would include the construction of a denture upper and a removable partial denture, thus reduce the impact caused only in the lower anterior teeth also being distributed to the teeth later. Thus, this may stabilize bone resorption in the anterior maxilla.

The first consultation was held the anatomical molding and shaping of the RPP. In anatomical molding was used silicone Speedex condensation (Vigodent, SP), making the first molding heavy folder to be able to depart from the tissues, and the second molding was used to carry folder, equalizing the pressures and obtaining a faithful copy and more detailed.

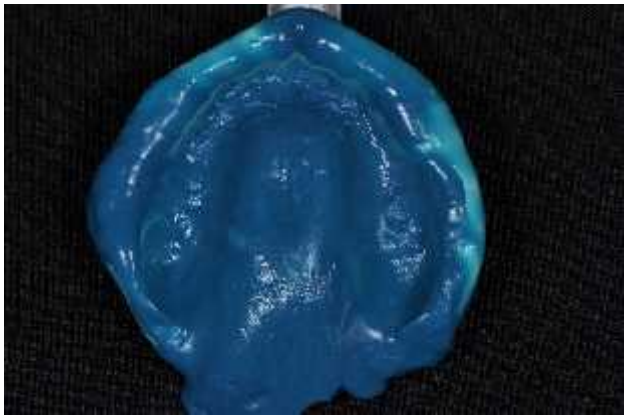

Figure 4. Anatomical molding.

Before making the molding with alginate for making the RPP, were first carried out niches in the teeth in the mesial 35 and cingulate 33 and 32. Then the plaster was poured into each mold, and the upper mold was made dicagem to have a greater reproduction of the vestibule fund. After this procedure, the lower model was referred to the prosthetic in order to perform the metal structure. With the top model was made ready an individual tray with clear acrylic resin to be made functional molding, to be even more faithful and more detailed.

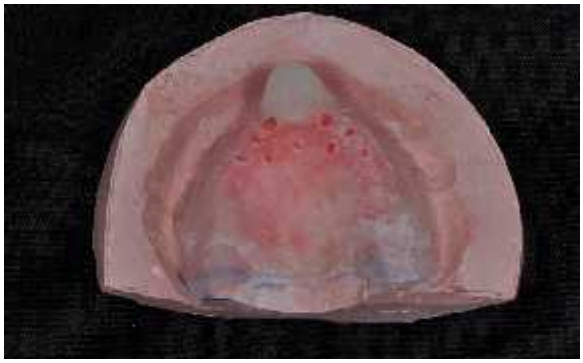

Figure 5. Acrylic impression tray.

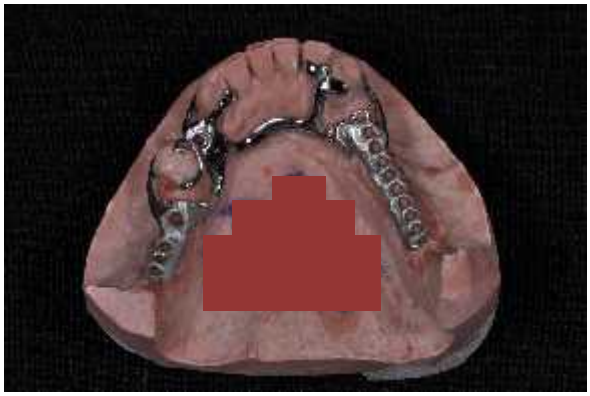

Figure 6. Niches and metal structure.

In this second molding undercuts made in the anterior palatal region and holes in the tray to the material flow because the mucosa was extremely flaccid, molding was performed with zinc eunolic folder, and then the light folder addition of silicon.Again we made the dicagem that mold, to have a full reproduction of the vestibule fund and vazamos the plaster. The important thing, regardless of the name used, is that the molding material does not bend the mobile mucosa region, which in this case is considered relief zone and gently compress the compression areas, reproducing the anatomical details of chapeável area and the muscle insertions.

Figura 7. Relief on the palate.

Figure 8. Perforated impression tray.

Figure 9. Moldagem funcional com alívio em área flácida.

After completing this step, it was made proof based acrylic resin and wax rollers number 7 for the aesthetic markings and installing semi adjustable articulator. After these procedures were performed hits vestibular anterior region (lip support), height and vestibular position, observing the visible wax with the lip at rest.

Figure 10. Proof base.

To correct the upper region, the patient was placed in RC and used the Fox ruler, watching the line of the tragus to the nose wing parallel to the occlusal plane and the incisal plane parallel to bipupilar plan. The lower wax plan was placed on the line dividing the wet mucosa of drought, the markings on the upper wax plan were: midline, nose wing line (canine distal to the distal of canine)

and forced smile line (height incisor).

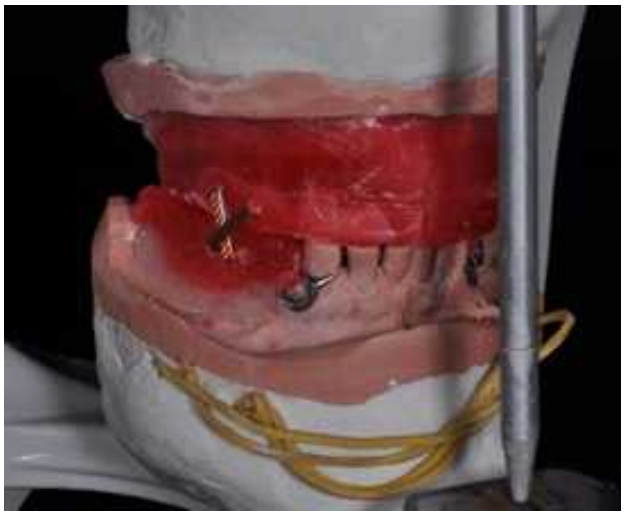

Figure 11. Mounting on the articulator.

After these procedures work was mounted in semi-ajustável articulator in centric relation and sent to the prosthetic to the making of upper dentures and lower partial dentures. For fixing the wax plans were used staples and eunolic zinc paste.

Figure 12. Mounting on the articulator.

Figure 13. Mount side view on the articulator.

The choice of color of the teeth, were made through the lower natural anterior teeth and was determined to A3 color VITA scale. The tooth model was chosen by letter mold NOBILE 2. This choice was made according to the design of the dental arch of the patient, and we can see that is an oval arch. The central incisor average 9 mm height and 46 mm from canine to canine, thus it was decided to choose the -3N- tooth.

Figure 14. Choice of gum color.

Figure 15. Choose the teeth color.

As soon as the dentures back from the lab, was made to test the new prosthesis in the patient, and the result was very satisfactory for the purpose of the work was to minimize the touches of anterior teeth were successfully obtained.

Figure 16. Occlusion no ringing previously.

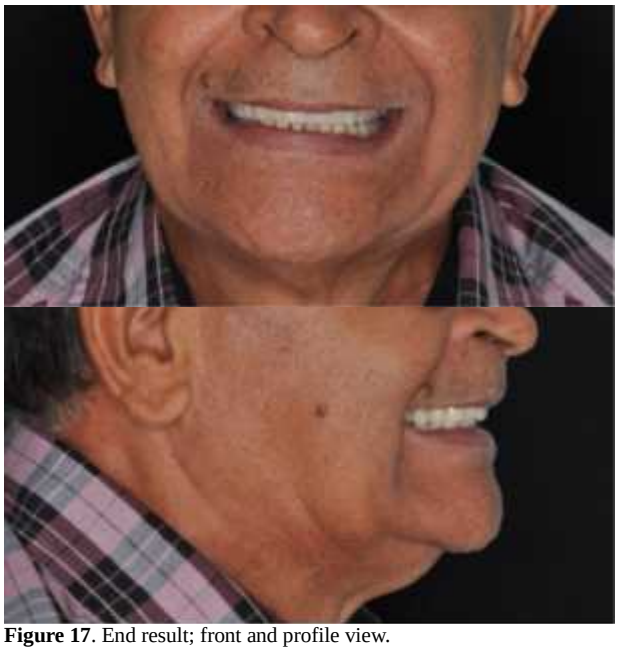

Figure 17. End result; front and profile view.

3. DISCUSSION

The causes of occurrence of the combination syndrome are contradictory in the literature. Although the literature point out specific clinical data that make up this syndrome, it is unclear whether the patient should present the five signals simultaneously to be considered bearer of combining syndrome. However, there is a consensus that the events starting with the lack of adaptation of patients using lower removable partial denture. This difficulty is justified by the large bone resorption seen in these patients, due to old dentures poorly planned and / or executed.

Bone loss is the main consequence of syndromes me the combination. Kelly (1972)[8] concluded that the process starts over the posterior bone loss in the jaw, which was confirmed by Nogueira *et al*. (2002)[9]. In contrast, Saunders *et al.* (1979)[9] reported that bone loss in the anterior maxillary area is the precursor clinical signs of syndrome.

Oral Rehabilitation, through total or partial dentures or both, have been shown, along the dental history, a feasible way to properly treat patients. The importance of knowing diagnose, make a treatment plan and knowledge of the signs of destruction of the supporting tissues that characterize the syndrome called the combination, is of utmost importance[10,11].

When the anterior lower teeth are present as opposed to an upper dentures, trauma on the anterior maxillary region is inevitable because patients tend to use them functionally with greater strength. This functional excessive force and in some cases parafunctional in excursive movements, constantly overwhelm the anterior region of the jaw, pressing her and taking her to an exaggerated resorption and even to a possible development of epulides cracked. The author believes that implant Bridges are the only option to minimize syndrome combining long-term and restore an occlusal balance really stable[12].

According to Zarb (2006)[13] the main consequences of the use of implants is the reduction of residual ridge and pathological changes of the oral mucosa. So that the adverse sequel is reduced some factors must be considered: the patient with dentures should follow a regular control at yearly intervals, allowing an acceptable adaptation and a stable occlusal condition; the restoration of the partially edentulous patient through the dentures should be considered if this is the only alternative as a result of inadequate periodontal health, an unfavorable location of remaining teeth and edentulous patients and economic limitations should be aware of the advantages of an implant-supported prosthesis. In young patients, the primary benefit would be the reduction of residual ridge resorption. In older patients, the main benefits are the improved comfort and maintenance of masticatory function[13].

In a study by Cunha *et al.* (2007)[5] evaluated the prevalence of the combination syndrome. The clinical findings were correlated with the presence or absence of temporomandibular disorders (TMD) that allow the classification of subjects studied according to the degree of TMD (absent, mild, moderate or severe). It was observed that no patient had all five signals described by Kelly (1972)[8] and 84.85% were between two and four signals.

O conhecimento e aplicabilidade dos profissionais que trabalham com prótese dentária e observaram que a síndrome de combinação está presente na clínica diária em 75% dos profissionais[2]. A partir dos resultados obtidos, concluíram que a maior parte dos profissionais não utilizam uma técnica específica de tratamento e não sabem identificar todos os sinais que caracterizam tal síndrome. Os autores afirmam que revisões frequentes para avaliar a estabilidade e a retenção das próteses devem ser programadas e ajustes devem ser feitos quando necessário. Kelly (1972)[8] concluiu que o processo se inicia através da perda óssea posterior na mandíbula, fato confirmado por Nogueira *et al.* (2002)[10].

In a study of syndrome combination of upper dentures patients and lower implant-supported overdenture, observed that the combination syndrome also occurs in patients who have lower overdentures retained by two dental implants. Thus, as more specified treatment mode, it is necessary to install implants in the maxilla minimizing the previous contact between the overdenture lower and an upper denture[14].

According to to Feori et al. 200015, the use of natural teeth, and more recently implants as support elements and stabilization for fixation on dentures and fixed prostheses, brought new perspectives to minimize the effects of this syndrome in the lower arch, providing greater comfort and masticatory efficiency for these patients, showing with values close to those observed in dentate patients[15].

4. CONCLUSION

Currently, even with all the technological advances, the bone resorption process is inevitable after the loss of teeth and is accented with the use of inappropriate aids. Considering that associate Total prosthesis (TP) upper with removable partial dentures (RPP) below can be one of the triggering factors of the previous hyperfunction syndrome, it is for the dentist to diagnose their characteristics before establishing any form of treatment with the purpose of obtaining prostheses with appropriate occlusal schemes for the return of harmony and balance of the Stomatognathic System. Therefore we can conclude that the main objective was achieved since removed the anterior teeth touch the lower.

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AESTHETIC ENDODONTIC REHABILITATION OF UPPER-CENTRAL INCISOR TREATY

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ABSTRACT

The esthetic dentistry is an important aspect, where the presence of discolored teeth could bea concern for the patient. The practice of non-vital teeth whitening is constant acts in the clinical work, because of the blackout bother the patient. The dental bleaching is possible only thanks to the permeability of the dental structure to bleaching agents which have the ability to diffuse freely through the enamel and dentin. In the reported case, the mixed technique of home bleaching with the use carbamide peroxide at 16% and the office of exogenous whitening in three sessions with hydrogen peroxide at 35%, was used at the end of treatment, were performed two procedures, namely , composite resin restoration to the tooth to be bleached and proximal manufacture of glass fiber post for the purpose of reforce the restorative composite used. Thus, it was proved that, taking into account the coronal structure features the use of exogenous whitening as conservatively relative to external cervical reabsorsation.

KEYWORDS: Tooth whitening, bleaching agents, restoration.

1. INTRODUCTION

The aesthetic in dentistry is an important aspect, where the presence of discolored teeth ends up being a concern for the patient. The practice of bleaching non-vital teeth is a constant act in the office because of the blackout bother the patient, disrupting social and professional relationship of the patient. Tooth bleaching is a widely used procedure and required to solve these problems, it is a conservative treatment that brings back the aesthetic and restores natural smile[1].

The dental darkening is due to intrinsic factors (pre- and post-eruptive) and extrinsic. The pre-eruptive may be caused due to use of drugs (tetracyclin), systemic factors (fluorosis) during the formation of the tooth germ or pulp necrosis, post-eruptive, when pulp begins to decompose it ends up releasing hemoglobin, containing iron, combining with hydrogen sulfide that is produced by the bacteria to form ferrous sulphide, a dark color, thus changing the color of dentes[1]. Since extrinsic factors, are the staining that are acquired over the years by the use of beverages with pigmentation as wine, coffee, tobacco or the use of prostheses which have metal and are formed by precipitation of dyes and diet pigment on plaque which coats the tooth[2].

The tooth whitening to be a conservative technique is becoming an increasingly common practice in offices as a way to improve the harmony and presentation smile. The bleaching in most indicated pulped teeth is endogenous, however, some indication should be taken into consideration at the time to brighten, as state dental remaining, presence of lesions, darkening tetracycline, fractures[2].

The shade of a tooth is directly related to the quantity and the wavelength of light incident on its surface, which is reflected or absorbed. Dark objects absorb much of the incident light, resulting in no color. The formation of long molecular chains within the tooth structure is responsible for an increase in light absorption rate, thus resulting in browning[2].

Root canal treatment done properly does not cause color change. However the dimensions of color (hue, chroma and value) are influenced by the presence of the dental pulp, and when it ceases to exist, there may be a change in color and brightness of the tooth[3].

The dental darkening occurs by chromophores (pigments) impregnated in the dental structure for various reasons, when these pigments form a molecule capable of reflecting light at a wavelength visible to the human eye and whose intensity is higher than the light reflected by the tooth structure, predominated the pigment color and observed the blackened tooth[4].

Among the main causes of color change in pulped teeth can be highlighted: the presence of restorative

materials in the crown, bleeding inside the pulp chamber, decomposition of debris located inside the pulp chamber, root canal medication use and canal filling materials root[5].

Bleaching of non-vital teeth where the endodontic treatment was conducted recently has advantage in being made whitening as well as other advantages such as avoiding the wear of sound structures and show satisfactory cosmetic results, since the bleaching agent and the technique used are carefully selected[6].

Bleaching agents are vehicle free radicals unstable oxygen; when in contact with the tissues, undergo an oxidation process. These macromolecules are converted into molecular chains increasingly smaller, releasing carbon dioxide and water, which removes all or part of the pigments tooth structure by diffusion[2].

The presence of peroxide on the tooth surface, the saliva isolated turn, contributes to increase the dehydration of the enamel, which might be even more durable. The effects of dehydration in the tooth whitening may last for two weeks or more[7].

The dental bleaching is possible only thanks to the tooth structure permeability of bleaching agents that have the ability to diffuse freely through the enamel and dentin, thus acting in the organic portion of the structure, promoting whitening[7].

The application of different bleaching agents resulting in a relief of samples from enamel and dentin and dentin subsurface. Dentin is more susceptible to bleaching, even despite the fact that the product must penetrate through the enamel layer before spraying the subsurface dentin[8].

Pretreatment with dentinal tubules obstructed substances such as fluorides and angina compounds help decrease in sensitivity after or during the bleaching[9].

The use of less caustic, such as sodium perborate and distilled water, are less harsh to tooth structure, and presenting the same bleaching results obtained with hydrogen peroxide. Some authors even claim to become contraindicated in teeth whitening by metallic pigmentation, old darkening by medication or by systemic factors[10].

It is important to mention that some structural features and some of the enamel surface features may contribute to the precipitation of pigment such as roughness, the porosity, and depression[11].

The main bleaching agents used are hydrogen peroxide, carbamide peroxide and sodium perborate. Hydrogen peroxide appears to be the most effective agent to whiten your teeth and can be used alone, having various concentrations, ranging from 10% (home use) to 35% (use in odontoógico office). The carbamide peroxide is dissolved into hydrogen peroxide and urea, may nevertheless still present carbopol which is responsible for the slow release of oxygen, having concentrations of 10% to 22%. Since perborate with distilled water dissolved oxygen, sodium metaborate and hydrogen peroxide which is the material that will carry out the bleaching[10].

Contemporary tooth whitening is based on the use of hydrogen peroxide. This agent will act on dentin chromogens, thereby reducing the tooth body color[12].

Species subjected to bleaching, shows changes in the enamel and the cementum. However, the cementoenamel junction is the most affected part because it promoted changes in joint standard, increasing the exposure of dentin surface and forming junctions of the "gaps", displaying large areas separate cementum enamel without intermediate cementum and dentin tubules exposure when observed by scanning electron microscope (SEM)[13].

The most common side effect in whitening technique consists of tooth sensitivity. However, efforts to reduce the incidence and severity of sensitive teeth, fluoride is added to the bleaching properties of some materials. Damage to the structural integrity of the tooth is generally not considered a significant problem when related to bleaching. However, it has been associated with adverse effects such as decreased abrasion resistance, decrease in hardness, among other[14].

The post-bleaching invasive root resorption is related to a history of trauma. Bleaching agents can cause denaturation in dentin cementum enamel junction (CEJ), if the defect between cement and enamel is present. The denatured dentine can act as a foreign body and being attacked by periodontal tissue elements and may be reported cases of resorption without the presence trauma[15].

Studies have shown that effects of bleaching agents (hydrogen peroxide) in the mechanical and morphological characteristics of the adhesive interfaces of teeth whitened, with changes in bond strength values and standard interface between the adhesive and the bleached enamel. The loss of bond strength immediately after the bleaching treatment is related to the time of treatment, the applied concentration and the achievement of adhesive procedures period after tooth whitening[16].

One limitation of non-vital teeth bleaching discolored relapse color is initially obtained, which is caused by the diffusion of pigment substances and the infiltration of bacteria present in the space between the restoration and the tooth structure. It is believed also that other color change causes is the reduction of bleaching compounds, permeability inherent in the dental tissues (enamel and dentin) the extraneous substances and the restoration of darker molecules[17].

The combination of a direct restoration with composite resin with a glass fiber pin helps in maintaining the remaining tissue and the crown reinforcement, the resin cement is used in the cementing of the glass fiber pin[18].

The use of glass fiber posts has the advantage of being translucent, it over with, you win aesthetics. They are chosen to support restorations made of composites and

ceramics, especially in anterior teeth. Furthermore, polymerization is increased as this kind of pin can allow the passage of light[19].

This article aims to present a case of a patient report in which an exogenous bleaching was performed on a tooth treated endodontically.

2. CASE REPORT

Patient, female, 30 years old, attended the dental clinic at the University Severino Sombra complaining of darkening in the tooth 11. During the anamnesis it was found that the reported tooth had endodontic treatment performed 15 years ago. The clinical examination can be diagnosed presence of composite resin restorations in the middle third of the mesial of it and satisfactory endodontic treatment (Figure 1).

Figure 1: Initial aspect.

Just after the clinical examination, began the pictures agreement with the initial color of diagnosis according to VITA A4 range. It was proposed to the patient the use of exogenous bleaching with 35% hydrogen peroxide, for the tooth in question had become very fragile, so being a conservative, also linked to the home whitening option with silicon plate.

It was used for office bleaching the material of FGM (Santa Catarina - Brazil) Whiteness HP 35% according to the manufacturer's instructions. For home use, the material was the Perfect Whiteness (FGM - Santa Catarina - Brazil) with carbamide peroxide at 16%, following the manufacturer's instructions.

After photographic documentation, there was the impression from the patient with alginate, the model made of plaster type III and soon after the home use device. The third session was held the first application's office whitening, being used as a means of protecting the patient and Expandex gingival barrier, Topdam (FGM - Santa Catarina - Brazil). Three applications were made 15 minutes after each application material was removed by sucking and the end of the third application was made extensive washing with water to form the bleached tooth remineralization. At the end of the first consultation was delivered to patient whitening device and a syringe for home application only in the tooth to be bleached (tooth 11), still being held instruction as it should be done the same, with daily use of 2 hours (Figure 2).

Figure 2. Application of hydrogen peroxide (35%).

It was performed three subsequent office bleaching sessions with the patient daily using carbamide peroxide at 16% (Figure 3).

Figure 3. Teeth whitening after three sessions.

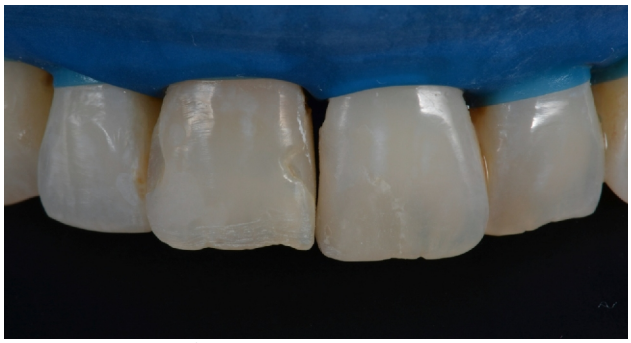

Figure 4. Isolation before restoration.

Figure 5. Appearance immediately after the restoration.

In the last session, held one week after the whitening in order to wait for the remineralization of the tooth and complete elimination of peroxides that could disturb the polymerization of the composite resin, was held exchange

of restorations old since it had cleared enough and then the present resins had yellowish appearance. At the end of treatment was diagnosed final color in the tooth, according to VITA scale B1 (Figures 4 and 5).

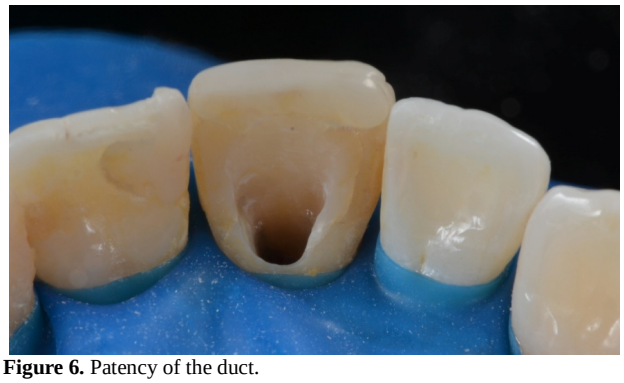

Figure 6. Patency of the duct.

Figure 7. Pin proof.

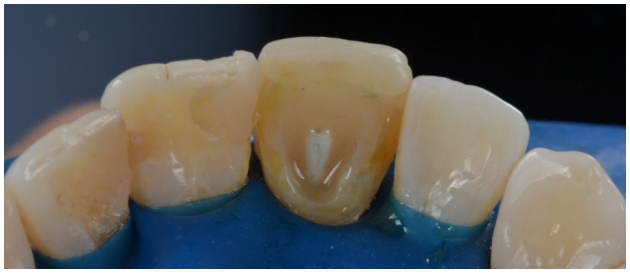

Figure 8. Cemented pin**.**

Figure 9. Final restoration**.**

Two months after the composite resin restoration has been performed the manufacturing of the glass fiber pin. It was carried the patency with Broad bits 1, 2, 3 and 4, and was used fiber pin number 2 brand Reforpost (Angelus) and cemented with resin cement U200 (3M ESPE) and held final restoration resin composed (Figures 6, 7, 8 and 9).

3. DISCUSSION

The dental darkening due to endodontic treatment, especially in esthetic areas, can cause the patient inhibition during the interaction affecting your social life. This patient reported inhibition of certain public activities as photographs showing the smile, among other social activities in your smile bothered her.

Dental dimming has a multifactorial origin, however, the most common is due to the endodontic treatment, in which authors state that the same only to be performed will occur darkening[2], because the pulp is removed features such as hue, chroma and value will be changed . However, some authors argue that the root causes for these color changes are due to: pulp hemorrhage, necrotic debris, access surgery, pigmentation dental materials[4]. In this case, the blackout was due to endodontic treatment, which was conducted 19 years ago, and the patient reports blackout for over five years and without the presence of trauma[1,4, 7].

The technique of bleaching, in cases of dimming for endodontic treatment, is in a more conservative procedure, taking into account procedures like ceramic laminates. The processing of this technique is the use of substances (hydrogen peroxide) which will act in the heavy molecules containing pigment which causes the tooth dimming releasing nascent oxygen that will cause the teeth to whiten [2],. Having to be taken into account saturation point to dentin presents, in which, from the same dentin will be eroded and the tooth to be bleached it will not introduce more changes. In the report presented opted for the combination of two techniques, which are: the home use with carbamide peroxide for 16% and office (exogenous) with hydrogen peroxide for 35%, this technique was chosen because the patient has extensive composite resin restorations and to prevent fractures by the tooth to be demineralized, a fact that occurs during the endogenous whitening[3,7,8].

The composite resin restorations, after endodontic treatment is something that should be explained to the patient, because it does not undergo bleaching along with the dental element. Thus, the restorations are essential parts of the treatment of tooth whitening, so that the smile and the look of the tooth in question get even more harmonious and pleasing to the patient. When the whitening is done on teeth with composite resin restorations, after its termination, it is evident the difference in color of the restorations, which with its exchange should help in improving the harmony and even tooth anatomy to be cleared. Thus, can be save the direct restorations increasingly dental element structures[4]. It cleared the tooth in question were required to be held two exchanges of res-

toration in order to preserve as best as possible the remaining tooth structure.

The use of glass fiber pins associated with composite resin restorations, it has the function of expanding the reinforcement of the coronal structure. This type of material has been gaining more space in direct restorations, for the same display linear thermal expansion coefficient similar to that of dentin, causing, during temperature changes. The pin does not frature root remaining associated to the pin, the cementing with resin cement (which prevents friction between the pin and the walls of the root dentin) and final restoration of endodontic access with composite resin, it makes the tooth can even clear anymore, after the bleaching treatment and strengthen the tooth, preventing that future fractures forcibly happen. In this report, the option of restoring definitively with glass fiber post aimed to strengthen the tooth by the same shows extensive composite resin restorations in both proximal and in the cingulate region (situation that would make the tooth more susceptible to future fractures)[18, 19].

4. CONCLUSION

We demonstrate in this case, taking into account characteristics such as the situation of the remaining tooth must be taken into consideration in order to protect in cases of external resorption. The office bleaching associated with the home and the adhesive restorative therapy proved effective in the successful return of the aesthetic aspect of the patient.

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PHYTOTHERAPICS USE IN MOOD DISORDERS: MYTH OR REALITY?

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ABSTRACT

In search of medicinal products that presented minor side effects for the treatment of mood disorders some experts have pointed out use of herbal medicines in cases of anxiety and mild depression. What caused a large increase in the marketing of herbal medicines with indications in affective disorders. However, some experts if they show indifferent or resistant to this practice. In this context, this manuscript aims a systematic evaluation of herbal medicines used pharmacologically in clinical medicine for the treatment of mood disorders, raising the discussion on the efficacy and safety of this pharmacotherapeutic approach.

KEYWORDS: Phytotherapics, medicinal plants, herbal medicine, mood disorders, depression.

1. INTRODUCTION

The knowledge of plants always followed human evolution. At first, the earliest civilizations observed the animals sought in herbal cures for their ailments. They realized that alongside edible plants, had other endowed with greater or lesser toxicity, and these to be experienced in combating the disease, showed, though, empirically, its healing potential[1].

Records dating from the year 5000 b.C., in China, there were lists of plant medicines used in therapy of that time. Chinese Sheuing in the year 3000. b.C., applied to the cultivation of medicinal plants. Cho-Chin-Kei, the great emperor, known as the "Chinese Hippocrates" had the most complete work of pharmacognosy of Ancient China. In it was described the medicinal properties of Ginseng and Camphor[2], used in therapy until the present day.

In Brazil, the use of medicinal plants has its base in the indigenous practice, and under the influence of African and European cultures, generated the popular use of many plant species, native and/ or acclimatized to our climate[3].

The Phytotherapy is used worldwide and is recommended by the World Health Organization (WHO) and widely used by the medical community[1].

According Tomazzoni *et al*. (2006)[4], increased consumption of medicinal plants and herbal medicines are due to the fact that people are questioning the dangers of abusive and irrational use of pharmaceuticals, seeking to replace them with therapies with fewer side effects. In addition, proof of therapeutic action of many plants used popularly has favored this dynamic. Another related factor is the dissatisfaction of the population before the official health system and the need to be able to control your own body and regain their health, taking health practices for you and / or your family.

Given the numerous literature reports describing the use of herbal medicines for mood disorders, especially in cases of anxiety depression 5-8, this manuscript aims a systematic evaluation of herbal medicines that are covered pharmacologically in clinical medicine for the treatment of disorders humor, raising the discussion on the effectiveness and safety of pharmacotherapy approach.

2. MATERIAL AND METHODS

The research was conducted through literature review with national and international articles obtained from BIREME databases (Virtual Health Library), PubMed (US National Library of Medicine), LILACS (Latin American and Caribbean Health Sciences) and SCIELO (Scientific Electronic Library), in order to perform an interpretative analysis of the rational use of herbal medicines in mood disorders.

3. LITERATURE REVIEW

Depression: a mood disorder

Mood disorders are characterized by affective manifestations considered inadequate in terms of intensity, frequency and duration. These manifestations, the most common is generically called depression and involves severe pain, which may include feelings of sadness, anxiety and hopelessness; low self-esteem; inability to experience pleasure; ideas of guilt, worthlessness and ruin; pessimistic views of the future and recurrent thoughts of death, accompanied by somatic alterations including sleep, appetite, psychomotor activity and sexual function. At the other extreme of mood disorders, are the manic episodes,

determined by an expansive affection, elated and irritable, as well as acceleration of thought with flight of ideas; inflated self-esteem and decreased need for sleep, among other changes[9].

Depression is an affective or mood disorder that accompanies mankind throughout its history. It is considered the Century XXI disease, despite not having origin in modern life, having been described by Hippocrates there are approximately 400 BC, and however, it is increasingly common[10].

According to WHO, 121 million people suffer from depression worldwide. Brazil ranks first in the ranking of prevalence of the disease among developing countries. Projections by the World Health Organization (WHO) indicate that by 2030 depression will be the most prevalent evil in the world, ahead of cancer and some infectious diseases[11].

Depression is a common medical condition, chronic and recurrent. It is frequently associated with functional disability and impaired physical health, generating great impact on the lives of patients and their family, especially by losses in various fields such as financial, personal and professional, often making it impossible to carry out their daily activities normally, the being fourth leading cause of disability throughout the world. Given its high prevalence and social costs, is a major problem for public health in the Americas[12].

Its cause is not fully understood but it is known that is linked to genetic, biological and psychosocial factors, and genetic factors of great importance, since the pathology involves a biochemical imbalance of the neurotransmitters responsible for maintaining the humor, which can be family origin[13].

The treatment of depression consists of medication and psychotherapy. Pharmacological treatment is based on different classes of drugs such as tricyclic antidepressants (TCA), monoamine oxidase inhibitors (MAOIs) and selective serotonin receiving the (SSRIs). Although these drugs are already consolidated as effective in treating depression, side effects, are presented as the main variable related to non-adherence of patients to drug treatment[14]. Therefore, the reduction of side effects is fundamental to the success of treatment. In addition, studies on the incidence of mood disorders have shown that people at risk for depression has changed a lot in recent years[11].

Today depression affects children, adolescents and workers of working age. Thus, the expansion of the class of substances with antidepressant activity is of utmost importance, being one of the alternatives in the search for new molecules with the natural source.

In the search for treatments that have fewer side effects, some experts point to use of herbal medicines for mood disorders. Thus, there was a large increase in the marketing of herbal medicines with indications for affective disorders. Nonetheless, some experts have proved indifferent or resistant to this practice.

In this context, this article aims, a systematic evaluation of herbal medicines that are covered pharmacologically in clinical medicine for the treatment of mood disorders, as well as the development of a theoretical framework on the issue.

Phytotherapics in psychiatry

Valerian

Valeriana officinalis L. It is a medicinal plant of the Caprifoliaceae family (Figure 1), popularly known as valerian-of-pharmacy, or herb valerian wild cats, are very common in Europe and northern Asia. It is an herb of wet places, growing in abundance along the banks of rivers. It was widely used in the sixteenth century in Europe as perfume, despite the unpleasant odor. Its dye is today used as a sedative for presenting properties which facilitate and induce sleep[15].

Figure 1. *Valeriana officinalis* L. (Valerianaceae), vegetable drug that gives rise to herbal medicine registered with the National Health Surveillance Agency (ANVISA) as simple anxiolytic (Registrys: 1.2009.0004; 1.5423.0196; 1.4493.0042; 1.1861.0004; 1.1860.0032).

It is a species that has documented clinical efficacy[15-17]. The parties used this medicinal plant are the roots and rhizomes. Its extract is presented as a mixture of complex chemical constitution, but its therapeutic effect is related to the presence of: serquiterpenes the volatile oil such as valerenic acid and its derivatives, and iridoids the valepotriates type, such as: valtrate, diacevaltrate and 11-acevaltrate[18].

Valerian has several indications, but of greater importance to this article is related to its potential in treating nerve disorders such as anxiety and anxiety[17-19]. Due to its soporific potential, this plant is widely used as a mild sedative, tranquilizer in all cases of nervousness, even in cases of epilepsy and neurasthenia, and treating sleep disorders associated with anxiety.

Several clinical studies have proven the effectiveness of valerian as a sleep inducing agent, being correlated to valepotriates, which stimulate the release of gam-

ma-aminobutyric acid (GABA), increasing its concentration in the synaptic cleft, leading to the sedative effect. Another factor in the studies is the inhibition of the enzyme GABA transaminase valerenic acid, indicating that this inhibition increases the inhibitory effect of GABA in the CNS, thereby contributing to the sedative properties of valerian[18].

Hiperico

Hypericum perforatum L. (Figure 2), is a perennial herbaceous plant belonging to the Hypericaceae family, frequently found in European countries, Asia, North Africa and acclimatized in the United States. In Brazil it is popularly known as St. John's wort. From their aerial parts, obtain an extract popularly used to treat depression[21]. The chemical content evaluated to date points to the presence of essential oil, tannins, resins, pectin, naphtho-diantrones, floroglucinois (hyperphoria), flavonoids (quercetin, quercetrin, isoquercetina, rutin), procyanidins (procyanidin, catechin), phytosterols, vitamins C, carotenoids, amino acids, and saponins.

The hiperico is known since antiquity for its anti-inflammatory properties[20]. Nowadays, its use is related to the treatment of mild to moderate depression as well as treatment of associated symptoms such as anxiety, tension and muscle pain [23,24].

Butterweck (2003)[25] suggests that hypericins are responsible for the antidepressant activity. Already Kirakosyan *et al.* (2000)[26] attribute this activity to the group of hyperforin. However, the mechanism of action is not fully known. Nevertheless, numerous studies have reported the potential of this plant drug for the treatment of mood disorders[23-26].

Figure 2. *Hypericum perforatum* L. (Hypericaceae), vegetal drug which led to herbal medicine registered at ANVISA as an antidepressant (Registrys: 1.0155.0206; 1.1717.0055; 1.1860.0003).

Kava kava

Piper methysticum G. Forst. (Piperaceae), also known as kava-kava kava, intoxicating pepper, kava-root, kava pepper among other denominations. It is a natural plant of Pacific Ocean islands[27].

This plant was used for hundreds of years for various purposes at least curious. Women of the time chewed the roots and leaves of kava-kava in order to form dough, which spit into a container and mix together the various drinks thus preparing a cocktail that, would be served on occasions such as weddings, births and funerals. The plant was also used for religious rituals and ceremonial dances, as generated in these relaxing effect, decreased fatigue and anxiety and hence the welfare of these people[28].

Studies on the chemical composition indicate the presence of various substances, such as tannins, benzoic acid, cinnamic acid, sugars, bornyl-cinnamate, stigmasterol, flavocavaines, mucilages, pyrones, tetra-hydroiangonines and some mineral salts, particularly potassium. The substances primarily responsible for the pharmacological activity of kava- kava are the α-pyrones named kavalactones[29].

Figure 3. *Piper methysticum* G. Forst. (Piperaceae), vegetable drug that gives rise to herbal medicine registered at ANVISA as simple anxiolytic (Registrys: 1.1861.0089; 1.0235.0572)

The kava-kava is considered a drug alternative to the use of benzodiazepines because of its characteristic of not induce dependence in its users and not develop the adverse effects of benzodiazepines as loss of cognitive functions, drowsiness, reduced motor coordination[30].

In the years 1999 to 2002 this plant was in the top 10 best-selling herbal medicines in Brazil. It is indicated for the treatment of insomnia and anxiety, acting as soothing[5].

Nowadays the kava-kava has been widely used for treating anxiety, stress, insomnia, agitation, epilepsy, psychosis and depression. No information on the use of kava-kava for other pathologies. However, it is used in folk medicine to promote wound healing, treating migraines, colds and respiratory tract infections, tuberculosis, rheumatism, urogenital infections, including chronic cystitis, venereal diseases, uterine inflammation, intestinal problems, ear infections and abscesses[31].

The kava-kava has several effects on the central nervous system, related activities anxiolytic, sedative, anticonvulsants, local anesthetic, spasmolytic and analgesic; but still unknown the exact mechanism of these effects[32,33].

The consumption of kava in recommended doses and for a short period causes no adverse effects but their widespread use may cause hepatotoxicity, it is responsible for a large number of cases in Europe[5].

Maracuja or Passion fruit

Passiflora incarnata L., also known as flower-of-passion, maracuja guaçu, wild maracuja/ passion fruit, is a perennial, fast growing bindweed, belongs to Passifloraceae (Figure 4).

Plant native to the Americas, known in Brazil as "maracuia" whose origin is indigenous and means "food prepared in bowl"; worldwide known as passion fruit to have a mystical relationship with Christ's passion. Some writers consider symbolic the parts of the passion flower. For them the female part of the flower consists of a tripartite stigma representing the three persons of the Holy Trinity Father, Son and Holy Spirit; since the male part, which was composed of five stamens symbolized the wounds of Christ; the part called corolla represented the crown of thorns; as the tendril represented whip. Thus it is considered mystique that plan was sent to Paul V, who sent cultivate it in Rome[34].

The Passion fruit is being popularly used throughout the world for its sedative, soothing, antispasmodic effects, beyond combat stress among other utilities[20].

The part used this species are the leaves that have soothing properties, diuretic, emmenagogue, contraceptive and antifebris. The roots have anthelmintic and anti-inflammatory activities. Its leaves consist mainly of: flavonoids (apigenin, luteolin, quercetin, chrysin, kaempferol, isovitexin, orientin, among others); alkaloids (harmana, harmol, harmine, and harmaline harmalol); cyanogenic glycosides, essential oil etc[35].

Studies over the decades have shown that passion fruit is indicated for the treatment of neuralgia, generalized convulsions, hysteria, insomnia, nervousness and agitation[35,36].

According to the National Health Surveillance Agency (ANVISA), through the publication of Resolution No. 95 of December 11, 2008, the indication of *P. incarnata* is as a sedative, and its mechanism of action is related to the induction sleep, which causes sedation and reduces anxiety[37].

Their depressant activity is primarily related to the harmana and harmaline alkaloids, which are beta-carbolines (derived serotonin and tryptophan). Acting as inhibitors of mono-aminoxidase enzyme (MAO), and exhibit agonist action on GABA receptors and benzodiazepine[38,39].

It is unclear the intensity and frequency of adverse reactions and contraindications of this plant[40]. However, in the case of an overdose, it can cause sedation and potentiate MAOI therapy (inhibitor of monoamine oxidase). As for the side effects were not found evidence associated with passion fruit[39].

Figure 4. *Passiflora incarnata* L. (Passifloraceae), vegetable drug that gives rise to herbal medicine registered at ANVISA as simple anxiolytic (Registrys: 1.0155.0098; 1.6773.0202; 1.0974.0168).

Cratego

Crataegus oxyacantha L., also known as hawthorn albar (Portugal), spino albar, cratego, majuelo, hawthorn (England), Biancospino (Italy), aubépine or epine blanche (France); is a tree of the family Rosaceae, its height varies from 2 to 7 meters (Figure 5). It is found in almost all of Europe, from the Mediterranean to southern Scandinavia, and the Atlantic coast to the west of Asia, and Siberia, North America and North Africa[41].

Figure 5. *Crataegus oxyacantha* L. (Rosaceas) vegetable drug that gives rise to herbal medicine registered at ANVISA as simple anxiolytic (Registrys: 1.0155.0098; 1.7287.0051; 1.0974.0168)

Cratego has been used since immemorial times, but it was in ancient Greece, it was used to relieve heavy menstrual flow and relief of menstrual cramps. However, it is in the late nineteenth century in America, this plant gained notoriety being used in the treatment of atherosclerosis and angina pectoris[41].

The extract obtained from the aerial parts of cratego's main chemical components: procyanidins; flavonoids, derivatives of quercetol, such as hyperoside, rutin, quercetin, kaempferol, and apigenol: vitexin and derivatives, vincenina; carboxylic acid (oleanolic, ursolic, crategolic, besides essential oils and tannins. Pharmacological studies suggest that compounds related to the therapeutic uses described so far are the flavonoids and procyanidins[42].

The main uses involving mood disorders are as a sedative in cases of irritability, insomnia, anxiety, feeling dizzy, headaches and menopausal disorders; acts on the central nervous system producing an inhibitory action of the sympathetic tone improving symptoms of sentiment[43-45].

Mulungu

Erythrina mulungu Mart. ex Benth. (Fabaceae), It is popularly known as mulungu, immortal stick, Jewish slipper, parrot's beak.It is widely used in healing and african-Brazilian religious rituals. Of their shells were isolated and identified the alkaloids; erythrina, erythrocoraloidine, erisopine, erisodine, eritramine, eritratine, erisovine, compounds that are related to its sedative action[46] (Figure 6).

Figure 6. *Erythrina mulungu* Mart. ex Benth. (Fabaceae), vegetable drug that gives rise to herbal medicine registered at ANVISA as simple anxiolytic (Registrys: 1.7287.0051; 1.0066.0043).

Rodrigues *et al.* (2008)[46] reported the use of traditional mulungu for its soothing properties, sedative, hypotensive, tranquilizing, anxiolytic and atinociceptivo. Its use is through infusions, decoctions, dry extract, tincture and syrup.

According Faggion *et al.* (2011)[47], the erythrina alkaloid acts on the central nervous system (CNS), leading to a neuromuscular blocking smooth muscle relaxation and of significant anticonvulsant action.

Many literature reports suggest soothing action in cases of nervous agitation; used with sedative and hypnotic action and mild tranquilizer[48-53].

No interaction was found in the literature; however mulungu may potentiate the effect of some antianxiety drugs and antihypertensive.

Because it has hypotensive effect, it is recommended that patients who use herbal medicine to Mulungu base associated with antihypertensive medication, have your pressure controlled and monitored in accordance with proper precautions.

4. CONCLUSION

Currently, there are about 146 herbal medicines used in mood disorders registered with ANVISA, approximately 80 simple herbal medicines, and 66 herbal compounds. This figure is frequent changes, because the reality of the record is very dynamic, since the position of products and constantly modified. Every day, new drug are registered, while others lose their registration, either by rejecting the renewal request or cancellation of registration.

Among the herbal medicines registered for the treatment of anxiety and depression, the largest number of records in recent years, was awarded to Valeriana, with the total number of records with 47 products, followed by Cratego with 31; Passiflora 25; Hypericum 17; Mulungu with 15 and with 11 Kava products commercialized in Brazil.

It must be emphasized that the drug registration in Brazil is governed by specific legislation, which requires compliance with numerous protocols to ensure the safety, effectiveness and quality of the pharmaceutical product. In this context, the use of herbal medicines for the treatment of mood disorders has grown tremendously in recent years. Currently, there are health professionals with diverse opinions on the subject, supporters and tough, but we can conclude, before reports here exposed, that the herbal medicine, is still great ally of man for the treatment of mood disorders.

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THE LIRAGLUTIDE USE IN THE TREATMENT OF TYPE TWO DIABETES AND OBESITY: LITERATURE REVIEW

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ABSTRACT

The Diabetes *Mellitus* type two (DM2) is a chronic, progressive, multifactorial, non-transferable, is related to a group of syndromes or metabolic disorders whose main features to non-production of insulin by the pancreas or the blocking of the cellular response to insulin produced, then taking place a deficiency in the secretion and/ or action of the hormone insulin. The latest class introduced on the market is based on the activity of incretin (hormones produced by the gastrointestinal tract, which enhance the secretion of insulin after food intake). The Liraglutide is an analog of glucagon-like peptide-1, and represents an innovative, secure and sustainable strategy for patients with DM2, it is an incretin hormone that is released from the gastrointestinal tract in order to increase insulin secretion by pancreatic beta cells. Glucagon-like peptide-1 significantly increases insulin-dependent glucose secretion, decreases glucagon secretion, increases sensitivity to insulin, slows gastric emptying, and decreases the appetite with agonist action on its receptors. This study aimed to review the literature through the use of liraglutide in the treatment of DM2, as well as investigate the prospects and security of the use of liraglutide in obesity and contribute to subject the technical upgrade.

KEYWORDS: Diabetes *Mellitus* type two, obesity, analogue of glucagon-like peptide-1, Liraglutide.

1. INTRODUCTION

Physical inactivity triggered by modern life and then obesity poor diet contributes directly in the etiology of diabetes mellitus type 2 (DM2) in adults, regardless of body mass index or family history of diabetes. It is known that this metabolic disorder is considered a global pandemic whose prevalence has reached epidemic proportions quickly, the main disease involving the endocrine pancreas and today is one of the most important causes of morbidity and mortality[1 2,3,4].

The DM2 is one of the most frequent chronic diseases and continues to grow in number, social and economic importance, thus representing a huge economic burden on health institutions[4]. Thus, then obesity poor diet and physical inactivity triggered by modern life contribute directly in the etiology of type 2 diabetes in adults, regardless of body mass or history of diabetes in the family index. It is known that this metabolic disorder is universal reality, whose prevalence has reached epidemic proportions quickly, the main disease involving the endocrine pancreas and today is one of the most important causes of morbidity and mortality in the general population[12].

When ingest nutrients, there is the release of gut hormones known as incretins, in which perform an important function sum that is the increase of postprandial insulin secretion. The incretins are related to the physiological regulation of blood glucose levels, since the main incretins are GLP-1 (glucagon-like peptide-1) and GIP (glucose-dependent insulinotropic polypeptide)[5].

Liraglutide is an analog of GLP-1 is an innovative, secure and sustainable strategy for patients with DM2. It is an incretin hormone that is released from the gastrointestinal tract in order to increase insulin secretion by pancreatic beta cells. GLP-1 significantly enhances the secretion of insulin-dependent glucose, decreases glucagon secretion, delays gastric emptying, decreases appetite and its agonist action on receptors resulting in weight reduction[6].

Individuals without diabetes and overweight are making use of this drug as slimming. Because it is a new drug, liraglutide has proven its effectiveness in these cases and it is not known the dangers of this use. Thus, this study aimed to review the literature through the use of liraglutide to treat DM2, as well as investigate the prospects and security of the use of liraglutide in obesity and contribute to technical theme update.

2. MATERIAL AND METHODS

This article is a literature review. The aim of this study was discussing the use of liraglutide in diabetic patients and investigates the prospects and security of the use of liraglutide in obesity.

Sites were surveyed covering existing publications in Pubmed database (National Center for Biotechnology

Information), SciELO library (Sientifc Electronic Library online) and books of the Faculty Inga library collection, including studies that have addressed the issue since 2000 to 2015 using the following key words: type 2 diabetes, obesity, analogue of glucagon like peptide-1 and liraglutide.

3. DISCUSSION

Diabetes *Mellitus*

According to the International Diabetes Federation, the prevalence of diabetes worldwide in 2011 reached 366 million people, and the expectation is that this number will reach 552 million in 2030. Studies in the literature used electronic data stored in the Primary Care System Ministry of Health in Brazil where the prevalence of diabetes *mellitus* (DM) has been above 10% between 2002 and 2007 in most states[7,8].

The incidence of diabetes is often omitted in these studies of prevalence because the diagnostic criterion used is the fasting plasma glucose. From 2010 through the use of glycated hemoglobin and possible association of this with fasting glucose for diagnosis, the prevalence of DM can increase by up to 50% in people over 50 years[4].

Diabetes is a chronic, progressive, multifactorial and non-communicable disease is related to a group of syndromes, metabolic disorders whose main characteristics of the non-production of insulin by the pancreas or blocking the cellular response to insulin produced, then occurring a deficiency in the secretion and / or action of the hormone insulin. It is the primary metabolic syndrome with numerous complications and are closely related to other conditions or set of symptomatology[6,9,10,11].

Diabetes is not a disease relatively simple; it is a heterogeneous group of syndromes that can be total or partial. According to the American Diabetes Association (2008) 12, the criteria for diagnosis in short are the following symptoms: polyuria, unexplained weight loss, polydipsia, plasma glucose concentration random greater than 200 mg/ dL, plasma glucose concentration in 126 fasting mg/ dL or plasma glucose concentration greater than 200 mg/ dL within 2 hours after ingestion of an oral glucose load[12,13]. Furthermore, the American Diabetes Association (2008) 12 adopts four clinical classifications DM: diabetes *mellitus* type 1 (insulin dependent) diabetes mellitus type 2 (non-insulin dependent diabetes), gestational diabetes and diabetes due to other causes (e.g. , medications or genetic defect)[13].

DM1 comprises 5-10% of all cases of DM, affects children and young adults (under 20 years), but some latent forms may occur later. The disease is characterized by destruction of pancreatic beta cells, resulting in complete loss of endogenous insulin secretion, postprandial glucose concentrations increase due to a lack of insulin stimulation by elevated hepatic glucose production, and hypersecretion of glucagon by the absence the compensatory compliance insulin. Symptoms include polydipsia, polyphagia, polyuria and loss of body mass. As for the causes can be: idiopathic, which is unaware of the cause of this destruction, or autoimmune disease, attributed to targeted autoimmune processes against these cells, naqual there is presence of autoimmunity markers (antibodies against the cells of the islet or anti-insulin antibodies) triggered by genetic predisposition, environmental factors and may be further infections or conditions such as tumors. A person with type 1 diabetes are insulin dependent and need of exogenous insulin (injected subcutaneously) to control their blood sugar levels, thus preserve life and prevent ketoacidosis. When untreated appear nausea, vomiting, dehydration, coma and ultimately death (Table 1)[13,14,15].

Type 2 diabetes is the most common form of diabetes affected group, affecting around 90% of diabetic patients. As previously mentioned it is a metabolic disease, progressive, multifactorial and global presence, which directly affects the quality and style of life of diabetic patients. These patients can be reduced by 15 years of age or older, where most have cardiovascular complications. DM 2 is associated with three physiological changes: impaired insulin secretion due to dysfunctions in pancreatic beta cells (especially in the postprandial state), peripheral resistance to insulin, and an inability to suppress glucagon secretion (Table 1)[3,16].

Table 1. Characteristics of Diabetes Type I and Type II

	Type 1	Type 2
Age at the onset	Usually during childhood or puberty.	Often over 35 years
Nutritional status at the beginning	Often malnourished	Generally the presence of obesity
Prevalence	5 to 10% of diagnosed diabetics	90 to 95% of diagnosed diabetics
Genetic predisposition	Moderate	Too strong.
Defect or disability	The beta cells are destroyed, eliminating the production of insulin	Inability of beta cells to produce appropriate amounts of insulin; insulin resistance; other defects

Source: Clark, M. A., Finkel, R., Rey, J. A., Whalen, K., 2013.

In the development of DM2 above adipose tissue requires increased acquisition of insulin hormone and in patients with DM2 notes a considerable resistance to this, due to a reduction in insulin receptors or a failure of the

cellular transport mechanism, causing a rise on the blood glucose, triggering the hyperinsulinemia frame[1,2,17].

Gestational diabetes has its onset or first recognition during the period of pregnancy and is defined as carbohydrate intolerance. In this phase it is important to keep the blood glucose controlled rates because uncontrolled can cause fetal macrosomia, shoulder distorted, and neonatal hypoglycemia[13].

The incretins effect and the Glucagon Like Peptide-1 hormone

The incretins are gastrointestinal hormones described since 1960. Its "incretin effect" is characterized by a greater increase in insulin secretion when glucose administered orally and compared with parenteral administration of an isoglycemic infusion[4].

The glucose-dependent insulinotropic polypeptide (GIP) and Peptide-1 (GLP-1) glucagon are the two most important incretinics hormones. GLP-1 and GIP are small peptides, formed by 30 and 42 amino acids respectively released by the L enteroendocrine cells which are located in the distal ileum and colon and the K cells in the duodenum, respectively, since both stimulate insulin release only when the concentration of blood glucose is elevated, by increasing the secretory capacity of the endocrine pancreas and thus has improved glycemic levels[4].

GLP-1 controls blood glucose levels, which in their physiological concentration, stimulates insulin secretion endogenous glucose-dependent, also lowers glucagon secretion (with deletion of production of hepatic glucose) so that it has reduced the rate of gastric emptying and therefore the calorie intake. GIP in turn slows gastric emptying with less intensive and does not inhibit glucagon secretion[4].

Native GLP-1 and GIP are slightly degraded by the proteolytic enzyme dipeptidyl peptidase-IV (DPP-IV), which cleaves the two N-terminal amino groups of the peptides giving inactive metabolites. With the activation of the DPP-IV has the degradation of GLP-1 and formation of metabolite GLP-1 starch, which does not activate the GLP-1 receptor. Thus, there has been an increase in insulin secretion during an intravenous infusion of GLP-1 in diabetic patients with this functional beta cell; Its metabolite not regulates insulin secretion and glucose metabolism[4].

Clinical uses of liraglutide

Liraglutide has about 97% homology with GLP-1 and was recommended for marketing authorization under the trade name Victoza®. Liraglutide stimulates insulin secretion and improves beta cell function (including restoring glucose sensitivity) in a glucose-dependent manner, thereby helping to reduce the concentration of glucose in the blood. Moreover, decreases glucagon secretion inappropriately high, also in a glucose-dependent manner, which results in reduced hepatic glucose production. Thus, when the blood glucose is high, insulin secretion is stimulated and glucagon secretion is inhibited. On the other hand, when the blood glucose is low, liraglutide suppresses glucagon secretion and lowers insulin secretion[18,19].

Thus, liraglutide is an attractive alternative for the treatment of DM2, it has significantly improved glycemic control with a low potential for hypoglycemia (because your glucose mechanism of action dependent), and has greater efficiency and conservation in the function the beta cells. Treatment should be started preferably in the early stages of DM2, where the clinical benefits are more relevant than in the final stages, where the degree of deterioration of beta cell function can no longer allow this recovery, because it is not recommended replacement of insulin by these later stages liraglutide[19].

The Liraglutide has a pharmacodynamic and pharmacokinetic profile suitable for subcutaneous administration, and it must be administered once a day[20]. The initial dose is 0.6 mg per day. After at least one week, the dose should be increased to 1.2 mg, depending on the clinical response after at least one week, the dose may be increased to 1.8 mg. It is not recommended daily doses greater than 1.8 mg.

The chain fatty acids allows liraglutide structures that form heptamers (micelles aggregate type) delaying the absorption at the site of subcutaneous injection, and provides protection against degradation by DPP-4 inhibitor. The maximum concentration is observed after 10-14 hours of your application and its half-life is 11-13 hours, providing a 24-hour action fraction[20].

The pharmacokinetics of liraglutide is not affected by gender, age or location. After the start of treatment, steady state concentration is achieved after 3 to 4 days [20].

Liraglutide to decrease body weight

Many seek for the ideal body, and are subject to think that being thin is the key to a healthy life[21]. The search for the ideal body weight loss and this model is not as quick and easy as well as it depends on what the person will present his body. And for the dream ideal body requires discipline and a different lifestyle, programmed with rules, change of physical, psychological behavior and nutritional education. When the recognition of the difficulties arises, or unsatisfactory results for this method people seek other solutions such as bariatric surgery, and the most common solution for medication, which often dispense medical advice[22]. However the obsession of people wants to be within the standards proposed by the company direct them to use increasingly improbable methods. Seduced by the desire for immediate weight loss, individuals end up opting for drugs that provide these effects[22 23, 24].

It was found after consistent observations that glucose reduction mechanism in the blood of liraglutide involves a slight delay in gastric emptying, decreasing food intake after a meal, reducing hunger and energy consumption, and thus the drug reduces the weight and body fat, including visceral adipose tissue, and consequently reduces waist circumference, improves lipid profile, and it has also benefits the cardiovascular risk profile[3,19,20].

According to a multicenter analysis, published in 2011 conducted in three countries with 929 patients with DM2 and use of liraglutide, been found that, liraglutide used in dosage of 0.6, 1.2 and 1.8 mg, a reduction of hemoglobin glycated (HA1c) 1.36% 1:45% is 1.39%, respectively, and it was also observed reduction in weight 1.8 to 2.4 kg[25].

Another US study, which aims to compare the use of liraglutide with glimepiride, showed a greater decrease in the levels of HA1c using the first drug and concluded that single dose of liraglutide provides effective glycemic control and not associated to gain weight, as reported that administration of 1.2 mg, the liraglutide demonstrated an improvement of 0.84% and, as the dosage of 1.8 mg, an improvement of 1.14%, whereas only 0.51% glimepiride. The study also reported average weight loss with the use of liraglutide at a dose of 1.2 mg 2.05 kg and at a dose of 1.8 mg, the loss was 2.45 kg, however glimepiride led to a weight gain 1.12 kg[26].

Auspar (2014)[20] conducted a study with liraglutide administered at varying doses of 1.2, 1.8, 2.4, 3.0 and 4.8 mg / kg, gave a reduction of 5.5 kg to 7.2 kg body weight, registering a percentage of 76% effectiveness of liraglutide in individuals who lost weight with their use compared to other drugs.

Therefore, the weight loss was reported as a side effect, however beneficial. Liraglutide is a relatively new drug; more studies are needed to assess their long-term effects and its use in non-diabetic obese.

Nonetheless, major side effects reported liraglutide are nausea, vomiting, diarrhea, negative effects on the thyroid gland, particularly in patients with pre-existing disease such as increased blood calcitonin, goitre and thyroid tumors. The use is also contraindicated in patients with own or family history of medullary thyroid cancer and in patients with multiple endocrine neoplasia syndrome type 2. In addition, the drug is not recommended for patients with significant renal impairment[27].

4. CONCLUSION

The obesity followed a poor diet and physical inactivity triggered by modern life contributes directly in the etiology of DM2 in adults, regardless of body mass index or history of diabetes in the family.

Liraglutide is the first human GLP-1 analogue approved for the treatment of DM2 in Brazil its use is approved by the National Health Surveillance Agency to market since March 2010.

This analog has a homology of 97% and is a safe, effective and innovative strategy for patients with DM2, and improve glycemic control (as it stimulates insulin secretion) this drug decreases the secretion of glucagon so dependent on glucose, reduces body weight due to delayed gastric emptying (feeling of fullness), improved function of β cells, reduces postprandial lipids, controlling systolic blood pressure, minimizes the risk of hypoglycemia.

However its use is not recommended for weight loss in non-diabetic obese patients. Although there are studies that try to prove the efficacy of liraglutide for the treatment of obesity, yet there is no indication in obese patients in Brazil, but several people are using for weight loss. So we need to examine further tests to prove their results and safe for weight loss. Thus, to date its use is indicated only as an adjunct to diet and exercise to improve glycemic control in adults with DM2.

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METHYLPHENIDATE: PRESCRIBED OR INDISCRIMINATE USE?

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ABSTRACT

Methylphenidate is the substance most frequently used to treat the Attention Deficit and Hyperactivity Disorder ADHD, which is characterized by low production of catecholamines and trouble of children and adults in modulating attention. However, it also be confused with ADHD disorders of learning programs, thus giving an erroneous diagnosis and unnecessary use of the drug. Thus, due to their psychostimulant properties, using methylphenidate has been indiscriminate, used mainly to increase the borderline intellectual yield of university, businessman and health professionals. Another bad drug use is done by mothers and educators who want to calm the student in the classroom and at home, in order to increase the concentration. The indiscriminate use and not related to ADHD, can lead to serious side effects and also to the future problems for the child, as a possible reduction in the height or a level of malnutrition due to reduced appetite associated with the drug. Another high risk of excess methylphenidate use is the case of dependency that may cause a drug overdose.

KEYWORDS: Methylphenidate, ADHD, indiscriminate use.

1. INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is defined being, children and adults with difficulties to modulate attention, control impulsiveness and lack of an appropriate motor activity[1]. The cause of ADHD may be due to the low production of catecholamines and affected individuals do not have a suitable behavior as people with normal nervous system[6].

ADHD may be confused with the diagnosis of several other types of disorders, so the importance to differentiate them[3]. Some disorders easy to confuse are the Learning Disorders, which is when the child does not follow the learning level considered normal for their age age[1].

Learning disorders are divided into three: Reading disorder characterized by the inability to identify words out of context. Calculation disorder that is characterized by low yield in arithmetic. Finally, the writing disorder characterized by ugly letter and a difficulty at times requiring the writing[3].

People who have ADHD and together learning disorder, may show changes that profoundly affect normal aspects of daily life.

To treat ADHD drug methylphenidate is indicated, which acts as a stimulant of the central nervous system[14]. However, before discovering the diagnosis of ADHD, its indication was for the treatment of narcolepsy, but now the drug has been widely used for purposes not therapeutic, such as cognitive enhancement of people who do not have criteria for diagnosing ADHD and not Narcolepsy, leading to a series of controversies and discussions about the indiscriminate use of this drug[13].

The indiscriminate and non-prescribed use of methylphenidate is carried out mostly by university, entrepreneur and health professionals, who have a better knowledge about it and know of its benefits of increased productivity at school, and professional[16].

What is being brought into question is the problem of this indiscriminate use in relation to excess, starting simply and over time increases the doses[12]. This dose escalation and its non-prescribed use can lead to side effects of short and long term [20].

Short-term effects may include decreased appetite, which can lead to problems that are more serious as, insomnia, abdominal pain and headache. Since the long-term effects are dependency, cardiovascular problems and a possible decrease in height. Some of these effects may be dose-dependent, namely common symptoms associated with ADHD, and that can decrease or disappear with time and dose reduction[20].

2. MATERIAL AND METHODS

Through literature about not prescribed and indiscriminate use of methylphenidate, we write this article, which corresponds to a literature review. The overall objective of this article is to approach about methylphenidate being used irrationally and that does not fit the diagnosis of ADHD, as well as its side effects in relation to this indiscriminate use.

The research for the literature were held in virtual libraries as Google Scholar, Scientific Search Engine

(Scirus), Scientific Library Online (SciELO), Virtual Health Library (BVS-LILACS), EBSCO host. The searches were carried out using the indicators ADHD, Methylphenidate, Ritalin® side effects, Indiscriminate use, resulting in 21 articles used, which were relevant to the construction of this article.

3. LITERATURE REVIEW

The term Deficit Disorder Attention Deficit Hyperactivity Disorder (ADHD) is defined according to the Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition (DSM-IV) as children and adults unable to modulate attention, control impulsiveness and lack of motor activity adequate[1].

ADHD can occur because of a mixture of genetic, neuropsychological and biological, genetic being the most common. During pregnancy and childbirth, the child's exposure to various chemicals may be related to ADHD[2].

Studies show that ADHD is an inherited genetic dysfunction of prefrontal cortex due to a deficiency of the neurotransmitter dopamine, that this disorder characterized by frequent symptoms of inattention, impulsivity, hyperactivity, disorganization and social disability[3].

The attention span of children's development can be a signaling feature. Children 1-2 years has less attention, however normal and which are slowly acquiring a greater focus on activities. However, it should be alert when the time is too short attention. The hyperactive behavior is associated with a rapid curious about other situations and objects, excessive trading of interest, causing the child to mobilize to reach them[4].

Hyperactivity and impulsivity may follow different lines of thought. Hyperactivity corresponds to exaggeration or excessive motor activity in children. Already expressed by sudden emotional reactions and the child's impulsivity, reflecting a thoughtless and sudden reaction[3].

ADHD can be caused by low production of catecholamines and affected individuals cannot moderate their attention, their activity levels, their emotional impulses or their responses to stimuli in the environment as people with normal nervous systems[5].

Research shows that the problems of academic performance and learning disorders are more common among people with ADHD with attention deficit dominance[6]. Some important work documenting the cognitive and behavioral problems associated with ADHD, even if it is difficult to distinguish whether the deficits are associated with ADHD exclusively or with other comorbid changes with the problems that have adults with ADHD and Learning Disorder (LD). There are changes in executive functions in the central nervous system area where so-brepõem or intertwine both disorders. Due to this reason there is the importance of differentiating the various types of inconvenience to not confuse them[3].

Learning disorder

When the child does not acquire school instrumental skills, according to their age, despite having possessed adequate opportunities to learn and normal learning ability. Is not defined as learning disorder when there is a neurological disorder, mental deficiency or absence of schooling[1].

The learning disorders are classified into Reading Disorder, Calculation Disorder, Writing Disorder.

Reading Disorder

The reading disorder (RD) is when a child does not learn to read despite having a sensory capacity, normal cognitive and learning opportunity properly. It is characterized by the inability to identify words out of context; the cause may be a deficit in the phonological processing[3].

Clinical and epidemiological studies demonstrate that ADHD, learning disorder and in particular the reading disorder not relate to each other, are independent of each other. The reading disorder is defined by the presence of deficit in the phonological and language processing[7].

ADHD and RD can appear in the same person, however, must be evaluated and diagnosed separates alia, in ADHD is the diagnosis taking into account behavioral manifestations. Already in the RD criteria of diagnosis are made on the basis of deficits in cognitive processes. Children with ADHD and RD have deficits in executive functions and tasks that require a phonological processing[8].

Calculation disorder

The calculation disorder is diagnosed when the yield in arithmetic comes in below the expected level according to the child's age. May interfere with an academic performance or even in activities of daily living that require certain skills[1].

This type of disorder is related to two types of problems: related to memory and related procedural skill[3].

Writing Disorder

In this disorder there is usually a combination of lack of ability to compose written texts, evidenced by errors in grammar and punctuation within sentences, poor organization of paragraphs, multiple misspellings or poor handwriting, in the absence of other losses in written expression[9].

The main feature relating ADHD in the literature is the ugly letter and a difficulty that requires writing[10].

Compared to students without the writing disorder,

approximately 50% of students with writing disorder drop out. Most likely to drop out of school are in prior even early years in the university bachelor[11].

Aman *et al*. (1998) developed strategies for ADHD evaluation, aiming to be the important information provided by parents or caregivers who have the disorder as: current problems of personal development, schooling[3].

Some more common symptoms later in life who have ADHD are grouped into four categories: 1- Cognitive: difficulty concentrating, confusion; 2- Problems to control the behavior: poor discipline; 3- Problems at work: income below capacity, difficulty of finding a job; 4 Changes in mood: depression, anxiety, low self-esteem[11].

People who have both ADHD and the learning disorder may have more profound changes that can affect aspects of daily personal life[3].

Methylphenidate

The methylphenidate is a drug derived from piperidine, which, like amphetamine, acts as a stimulant of the central nervous system by activating the excitation system mainly in the prefrontal cortex in limbic regions and striatum, increasing extracellular dopamine concentration by inhibit catecholamine receiving this through their respective carrier[12].

Methylphenidate mechanism of action consists in stimulating alpha receptors and beta-adrenergic directly, or release of dopamine and noradrenaline the synaptic terminals, indirectly[13].

Initially it was an indication of methylphenidate for the treatment of narcolepsy, a rare disorder of sleep, but other studies have begun to highlight the benefits for the treatment of hyperactive children and distracted. Today its main indication for therapeutic purposes is for the treatment of ADHD in children[14].

Methylphenidate, whose main trademark is Ritalin®, has been widely used for non-therapeutic purposes as cognitive enhancement of people who do not have criteria for the diagnosis of ADHD, thus raising a number of controversies regarding its indiscriminate use that is expanding gradually and can be a big problem of public health[13].

A predominant factor in the strong growth of the "misapplication" of the drug is their relation to the diagnosis of ADHD[15].

A concern of the National Health Surveillance Agency (ANVISA) is the inappropriate use of indiscriminate of methylphenidate hydrochloride. For this reason ANVISA suggested a follow-up of the drug in Brazil. This monitoring is conducted in partnership with the Pharmacy Council to raise awareness of pharmacists and prescribing this drug, aimed at rational drug use in states where there is a greater demand for this substance[15].

Pharmacy and Medical Councils should go into a consensus that the drug can have serious consequences for the future and raise awareness about its correct use[16].

The indiscriminate use of methylphenidate is largely made up of university, business and health professionals, to be associated with increased productivity (academic and professional). Usually these users have a deeper understanding about the drug[17].

According Buchalla (2004), hyperactivity was once considered an only child badly, now became also detected in many adults and methylphenidate drug for these cases is a major breakthrough. However, the big problem is the dark side of the drug, ie the excess. Many parents use the drug to leave the quieter children and to stop them with drugs[18].

The indiscriminate use of methylphenidate begins simply and with the passage of time, the person starts using increasing doses, tolerance increases and this leads to higher consumption. The big problem is that very high doses of the substance can lead to convulsions, headaches and hallucinations[12].

Other adverse effects of methylphenidate are short and long term. The short-term side effects observed prevailed decreased appetite, insomnia, abdominal and headache pain, but in patients who already make continued use of the medicine frequent symptoms can be associated with ADHD, these effects are dose-dependent and may disappear or decrease with time and dose reduction[19].

Regarding the reduction of appetite is noteworthy that associated with the drug a high calorie diet and multivitamins to compensate for weight loss and low food intake is required. Another factor that may also compromise the food is abdominal pain associated with reduced appetite in this case is necessary to reduce the dosage of the medicine and always take with meals. Regarding the headache, a way to get around it is associated with use of painkillers. To avoid insomnia should avoid the use of medication to sleep next time[20].

The main long-term side effects include addiction, cardiovascular effects and possible reduction of stature. The dependence is because patients achieve wellness and benefits with the use of methylphenidate, including increased alertness and concentration to perform daily tasks, it can also lead to an overdose of the drug[21].

Regarding the reduction of stature, a study are being conducted to see if stunting is related to medicine or is it a feature of the disorder itself, but there is still nothing conclusive on the subject.

The most common symptoms in cases of overdose include agitation, seizures, hallucinations, psychosis, lethargy, dizziness, tachycardia, hypertension and hyperthermia. Clinical manifestations that can be treated with benzodiazepines, antipsychotics, calcium channel blockers, alpha-adrenergic antagonists, and in the case of solid oral intake cause gastric lavage[21].

4. CONCLUSION

The ADHD disorders that affect the attention and concentration of children and adults and can be confused with several other disorders are diagnosed through rigorous criteria and its treatment is done using the methylphenidate drug, also known as Ritalin®. The methylphenidate advantages with respect to increased attention and concentration and well-being, can lead to indiscriminate and excessive drug, which can cause serious side effects. The big problem is that methylphenidate is being used by professional and college, not being associated with the diagnosis of ADHD, but the use is not prescribed and the search for the advantages that the product offers.

Therefore, it is concluded that the lack of knowledge, or knowledge in excess, relative to the drug and its side effects, together with the quest for an increase in efficiency and a sense of well-being, leads to indiscriminate and nonprescription of methylphenidate may cause future problems in children and even in adults. Often the constant propaganda that methylphenidate calms children can induce educators and responsible for the child to press doctors to prescribe methylphenidate, which could result in a diagnosis outside the box it would take for ADHD.

Through studies and discussions on the subject observed the need for the use of methylphenidate be narrower; the liberation of the drug to the patient must be done rigorously, if attesting that the patient really fits the clinical standards required for treatment with methylphenidate.

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CENTRAL VASCULAR CATHETER INFECTION BY *Staphylococcus aureus*

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ABSTRACT

Central venous catheters are used when extended access to vascular system is needed. The catheter infections occur in 19% of patients, with 12% of blood infection. *Staphylococcus aureus* is a bacteria that is usually found in this kind of infection, mainly affecting immunocompromised patients with extended access catheter. It is found in normal microbiota, and it houses easily when natural barriers are compromised, taking to local or systemic infections. This infectious agent has become important in nosocomial environments due to its resistance and adaptability. The frequent occurrence comes from the indiscriminate use of antibiotics and the huge amount of implanted catheters. Meticilin resistant *S. aureus* (MRSA) are becoming more common, due to the high capacity of mutations and acquirement of resistant genes. Based on these facts, this study had as an objective to perform a literature review about catheters infections by *S. aureus.* These agents install in catheters increasing the length of stay and hospital costs, when it comes to a blood infection. To control this kind of infection it is necessary to educate both the health professionals and patients.

KEYWORDS: Catheter-related infection, cross infection, *Staphylococcus aureus*

1. INTRODUCTION

Central venous catheters (CVC) long-term are used in clinical conditions hemodialysis, blood therapy, chemotherapy and parenteral nutrition, or when requiring long-term access to the vascular system. The infection associated with catheters occurs in approximately 19 % of patients, 12 % of cases of bacteraemia, and 7 % in local infections. Some factors contribute to the risk of infection as location of access, infused solution, length of stay, manipulation, work experience, and type of catheter[1].

Staphylococcus aureus and coagulase negative *Staphylococcus* are bacteria that are commonly observed in the CVC infections. These infections occur primarily in immunocompromised patients with prolonged catheterization[2]. *S. aureus* are gram-positive cocci, which are present in normal microbiota, ie, the human is its main reservoir, may cause from mild infections to severe. In case natural barriers are easily compromised it is lodged, causing a local or systemic infection. Due to its enormous capacity for adaptation and resistance *S. aureus* has become one of the species most important in the setting of nosocomial infections, and its occurrence is related to the indiscriminate use of antibiotics, and increased use of CVC[3.]

A problem that has afflicted the health professionals is the high incidence of Methicillin resistant *S. aureus* (MRSA). The medical and scientific concern about this strain comes from the beginning of antibiotic therapy, and has been increasing as new resistance mechanisms have emerged. The identification of MRSA must be rapid to avoid spread throughout the hospital region and isolation of patients is considered in many countries. Research shows that bacteraemias caused by such bacteria tend to increase the stay of patients in nosocomial settings at 40 % and 32 % of the costs[4].

Thus, this study aimed to verify the occurrence and problems of venous catheter infections by Staphylococcus aureus through a bibliographic review in books and scientific articles in national and international databases.

2. MATERIAL AND METHODS

The present study consists in a literature review by scientific articles found on sites like PubMed, Scielo, NCBI and books and periodicals present in the Faculty Inga Library in order to verify the occurrence and problems of venous catheter infections by *Staphylococcus aureus*.

3. DISCUSSION

Vascular catheter central

The CVC is an equipment device between the human body and the external environment, and is usually used in Intensive Care Units (ICU) for administration of nutrients, drugs, drug infusion, monitoring vital signs, hemodynamics and parenteral nutrition[4]. The use of CVC entails high risks and increases the chances of morbidity and mortality of patients, because it is invasive and dangerous[5]. The CVC may also compromise the patient's immune system, as through the skin, and a direct open pathway to the entry of bacteria and yeasts [6]. Moreover,

some studies show that the activity of the phagocytosis, and bactericidal activity of the cells is compromised in the presence of poly-tetra-fluoroethylene devices and poly-methyl-methacrylate materials[1,6].

When it comes to nosocomial infection, the problem is greater in ICU where the patient has 5 to 10 times higher probability of contracting infection. The risks are directly related to the severity of the disease, the patient's nutritional conditions, and invasive procedures among other aspects[3].

The age of one year or more than sixty, use of immunosuppressive drugs, antibiotics, presence of infectious focus, female, hospital stay, skin moisture compared to curative, are risk factors for contracting infections associated with CVC, however little is known about the profile of patients who develop this type of infection[7]. The type of material of the catheter, the insertion site, proper aseptic hand handler and aseptic technique in device deployment, with antimicrobial and antiseptic, are essential for the control of infection in CVC. It is very important the continuing education of health professionals involved in this procedure[1,8].

Hospitals alone are of great risk of biological contamination, wards are home to several patients with various types of infectious agents that spread easily. Several people infected with infectious agents facilitate that they have gene flow, which is the exchange of biological material between bacteria of the same species or not, and the inappropriate use of antibiotics accelerates the spread and strength of these agents[9]. Immunocompromised patients, HIV patients, and other debilitated patients are the main targets of these bacteria, the main carriers of these employees themselves, where they live in the nasal mucosa and skin mainly.

Staphylococcus aureus

Staphylococcus are gram positive cocci belonging to *Micrococcaceae* family, catalase positive, without spores, without mobility, usually not encapsulated, may appear singly or grouped into short and irregular chains. In nosocomial environment strain of *S. aureus* is most important because it is related to a number of human infections. The spherical shape and the presence of the enzyme coagulase characterize the species[3,10,11].

The *S.aureus* spread of efficiency occurs due to easy adaptation to different environments, pH, moisture and nutrient deficiency, making it viable for a long period of time, in a dust particle, or in human circulation environments. Man is the main reservoir, where about 40 % of the population has colonized nasal passages, throat and other sites such as skin, also have been described[3,12,13]. Most people is asymptomatic but infectious processes can result when natural barriers are compromised by a trauma or surgical procedure, or when, for example, opens a pathway to this microorganism[14,15,16]. The pathogenicity and colonization ability of *S. aureus* is directly related to its virulence factors are adherence host cells or the extracellular matrix; Evasion of the immune system of the patient enterotoxins, toxic shock syndrome toxin, protein A. beta-lactamases, coagulases, hyaluronidases and catalases are also some of the enzymes produced by *S. aureus* conferring great pathogenic potential[17,18].

S.aureus carries risks for diabetic patients, people undergoing hemodialysis, HIV positive, among others, causing infectious processes ranging from simple skin infections like folliculitis, impetigo, boils and carbuncles until systemic infections which can be fatal[12,13,19]. Patients who make use of CVC are susceptible to contamination by S. aureus, as a bacteria present in the normal flora of humans, where it evades the catheter insertion site. This bacteria is able to migrate into the bloodstream and can lead to severe bacteraemia, especially when the patient is home MRSA strains[20]. The catheter infection occurs in approximately 19 % of patients using CVC, 7 % local infections and 12 % of cases are bacteraemia[21]. The semi implantable catheters have higher infection rate 43 % of cases compared with 8 % of the fully implantable[8].

The bacteraemia associated with catheter has features for patients with fever or chills, and signs of inflammation. As proven by blood culture peripheral, or the own catheter, using literature to confirm the diagnosis described it: maki technique (more than 15 colony-forming units); Growth 5 to 10 times CFU/ mL in samples of blood; Growth 1,000 CFU/ mL of blood was collected from the catheter.[22,23]. This type of device has increased cases of primary bloodstream infections related to catheter and mortality was increased by approximately 20 %[24].

Antimicrobial resistance

At the end of the 1930s with the introduction of antibiotic therapy, the first two *S. aureus* strains resistant to sulfanilamide. The methicillin was the first semi-synthetic penicillin developed resistant to beta lactamase in 1960, but the resistance to this drug came less than a year after its release and then immediately resistance cephalosporins[25,26,27].

MRSA spread rapidly up the nosocomial ambietes, thereby limiting the antibiotics vancomycin and teicoplanin. In England the number of deaths due to resistant *S. aureus* increased between 2001 and 2005 by 122%, although no other country has had such a large index, MRSA is a global concern in the medical and scientific community[28,29]. Vancomycin has been known since 1956 but little used because of the success of penicillin. Currently in many cases of MRSA is one of the few effective drugs against this strain. In 1997 isolated the first strain resistant to vancomycin in Japan

and in 2000 in Brazil[30].

Antibiotic resistance is due to mutations in bacterial genes, which alters the antibiotic action site or by acquiring genes of other bacteria of the same species or not, that destroy or inactivate the drug, trasmitidas by plasmids and transposons[27,31]. In a hospital in Goiânia, the average number of cases of sepsis caused by MRSA in patients over one year, was 5 for 1000 inpatients from 2000 to 2001 and the death rate of 35.1 %[32].

The access of bacteria to catheters occurs in several ways: at the time of insertion, the colonization of the skin, contamination of connections, contaminated infusion solutions, hematogenic transmission of other infectious focus, or the hands of professionals or others. The infection associated with catheter bloodstream is one of the most serious complications, and second Belated prolongs patient hospitalization within 7 days increasing the additional costs to US $ 6,000 per patient. Therefore prevent this type of infection is the best way to avoid them[33,34].

The addition of anti-infective substances such as minocycline, rifampin, chlorhexidine and silver sulfadiazine, the catheters can prevent adhesion of microorganisms and formation of biolfimes. These catheters in short stay reduced cases of infections[33].

At high levels of *S. aureus* infections in nosocomial environments and high methicillin resistance level the World Health Organization (WHO) confirms the urgent need for the discovery of new antibiotics for the treatment of *S. aureus* resistentes[26,27]. In addition, understanding the danger of pathogenicity of S. aureus, can guide health professionals in the rationalization of antibiotics, thus reducing the chance of antimicrobial-resistant strains[2].

The Protocols of care to vascular access should be reviewed frequently, be standardized and available to everyone. So the key to control of infections related to catheters is effective and continuing education of health professionals[35].

4. CONCLUSION

Given the findings of the literature, we emphasize the importance of characterizing the type of catheter infection, to tailor the best treatment for each patient. The most critical point is the bacteraemia related to CVC, where knowledge about the pathogenicity of *S. aureus* can guide health professionals to the rationalization of antibiotic therapy, minimizing the chances of resistant strains. It is essential instruction on the correct use of antibiotics for patients because the neglect of the dosage and the correct treatment time has become more difficult will cure bacterial infections. Moreover, it is extremely important to invest in research and synthesis of new drugs effective against this infectious agent, especially resistant.

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