

# Evaluation of Oral Health in a Community of Native Brazilians of the Umutina Reservation, Mato Grosso State

## Evaluación de la Salud Bucal en una Comunidad de Brasileños Nativos de la Reserva Umutina, Estado de Mato Grosso

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**ABSTRACT:** The occurrence of diseases and variations from normality is very common in the maxillofacial complex, and this phenomenon is closely associated to peculiar genetic determinants and influenced by genetic isolation. Studies on the distribution of oral diseases and variations from normality in South American natives are generally directed mainly to the study of dental caries in the children and periodontal diseases in the adults, disregarding a wide range of other oral diseases. The aim of this study was to evaluate the distribution of lesions and anatomical variations from normality in eight ethnic groups living in the Umutina Indian Reservation, State of Mato Grosso, Brazil, through physical and oral examinations besides cytological evaluation and assessment of diet and habits, such as tobacco and alcohol consumption. A total of 291 Indians, of both genders, with ages ranging from 1 to 96 years, were examined, being identified 132 variations from normality, evidencing a high occurrence of ankyloglossia, which was present in 108 cases (37.1%), followed by benign migratory glossitis in 5 cases (1.7%); mandibular torus and candidiasis in 3 cases (1.0%). No malignant lesion was identified in the population.

**KEY WORDS:** indigenous health, diagnosis, disease prevention.

## INTRODUCTION

Some estimates suggest that the native Brazilian population in the period before the first contacts with the Europeans was composed of millions of individuals, divided into several linguistic trunks. According to the Indian National Foundation, there are currently around 350 thousand Indians in Brazil, distributed among 215 societies, corresponding to 0.2% of the Brazilian population. However, most of these individuals present racial miscegenation with non-Indians, particularly those who live close to urban areas or agricultural frontiers. Depending on contact with non-indigenous communities, the distribution of different types of oral diseases may change, reflecting changes in habits and nutrition, among other factors (Rigonatto *et al.*, 2001). However, data about the occurrence of oral diseases in South American Indian communities are scarce,

particularly in populations that still keep strong cultural, social and linguistic ties with their past. This is the case of Umutina, Paresi, Bororo, Bakairi, Kayabi, Irantxe, Nambikwara and Terena ethnicities, living in the Umutina Indian Reservation, in the State of Mato Grosso, where miscegenation with non-Indians is still very rare and endogamy is common. This population has suffered deep cultural and social transformations evidenced by the penetration of non-Indian habits in the youngest members, changing diet and social behavior.

Among the oral diseases described in South Americans Indians, dental caries (Rigonatto *et al.*, 2001) and periodontitis are predominant (Ronderos *et al.*, 2001; Dowsett *et al.*, 2002). However, variations

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from normality, as well as the other oral diseases, especially those deeply influenced by genetic traits, still deserve further studies for the establishment of public policies to evaluate and treat those populations.

The aim of this study was to identify the oral lesions and the variations from normality more frequent among the Brazilian Indians who live in the Umutina Indian Reservation, by mean of oral and physical examinations and cytohistopathological analysis, associating the occurrence of these conditions with dietary, socio-cultural aspects, and habits (tobacco and alcohol consumption, oral hygiene).

## MATERIAL AND METHOD

The research was carried out during a period of 12 months, on scheduled visits to the reservation, and was verified by the health team of Uniselva Foundation and the Health Board of the reservation. The study was approved by the Research Ethics Committees of the Dental School of UNESP - Campus at Araçatuba (2006-01417), of the Public Health School of Mato Grosso (021/07 CEP/SES-MT) and of University of Cuiabá (004/CEP/UNIC/2007). It was also approved by the community leaders and by the members of the Health Council of the Umutina Indian Reservation, of the Indian National Foundation, of the National Health Foundation, of the Indian Health District Board and of Uniselva Foundation. All patients in the study or responsible for their, written the consent term.

From a total of 380 Indians, the sample was composed of 291 subjects: 161 females (55.3%) and 130 males (44.7%), aged from 1 to 96 years. For each patient examined, standardized forms were filled in with data concerning identification, tobacco and alcohol consumption, frequency of exposure to sunshine, characteristics of diet, use of traditional or industrialized medicines, as well as the possibility of consanguineous relationship among members of the families.

The evaluation of the oral hygiene conditions was performed by means of O'Leary index. The presence and the clinical evolution of the lesions in the oral cavity were registered; cytology or biopsy were carried out whenever indicated. For diagnostic purposes, the ulcers or lesions suggestive of fungal infections underwent cytological examination, while other lesions underwent biopsies, according to their characteristics, suspected nature and evolution time. Tissues from biopsies and

cells collected from the oral mucosa were fixed in formaldehyde (10%) and alcohol (95%), respectively, and sent to cyto and histopathological analysis at the Pathological Anatomy Laboratory of the General University Hospital of University of Cuiabá-MT.

Prevalence and risk analysis were evaluated through the statistical methods of Cochran and Mantel-Haenszel for the dichotomic variables, or Pearson's Chi-square test for the variables with three or more categories. Significance levels adopted were  $p < 0.05$ .

## RESULTS AND DISCUSSION

The results evidenced that the sample of the 291 natives examined was homogenous with regards to age and gender. Only a minority of the population consumed alcohol (Chi-square test,  $p < 0.001$ ) or tobacco (Chi-square test,  $p < 0.001$ ), and males were more prone to these habits. Alcohol consumption was not concentrated on a specific age group and those who smoked also consumed alcohol (Chi-square test,  $p < 0.001$ ).

The majority of the Indian population showed to be frequently exposed to sunshine (Chi-square test,  $p < 0.001$ ), which is related to their traditional way of life, but this habit seems to be diminishing in the younger generations (Mann-Whitney test,  $p < 0.001$ ). A diet rich in fish, tubers and roots, as well as small mammals meat, particularly monkeys and rodents, was observed in 77% of the population; the consumption of non-autochthonous fruits and vegetables was poor (Chi-square test,  $p < 0.001$ ).

Poor oral hygiene occurred in males and females, but those who had poorest hygiene standards were the elderly (Mann-Whitney test,  $p = 0.005$ ) and individuals who did not attend the dental service unit (Chi-square,  $p = 0.018$ ). Early tooth loss was disseminated and the adolescents and young adults presented high numbers of mobile or fractured teeth (Mann-Whitney test,  $p = 0.005$ ). Gingivitis and periodontitis were observed in 53.3% and 42.3% of the Indians, respectively. Only 4.5% of the population, regardless of age or gender, was periodontally healthy.

In the population studied, 138 presented some kind of alteration from normality or oral disease that did not involve dental elements or periodontal tissues (Table I). None of those variations from normality or

Table I. Occurrence of oral diseases and alterations from normality in 291 Indians of the 8 ethnic groups living in the reserve Umutina, State of Mato Grosso, Brazil.

Alterations from normality and oral diseases	Occurrence n (%)
<b>Alterations from normality</b>	
Ankyloglossia	108 (37.1)
Benign migrant glossitis	5 (1.7)
Mandibular torus	3 (1.0)
Bone exostosis	1 (0.3)
Leukoedema	1 (0.3)
Lingual varicosity	1 (0.3)
Tongue crenation,	1 (0.3)
Fibroma	1 (0.3)
<b>Oral diseases</b>	
Candidosis	3 (1.0)
Labial herpes simplex	2 (0.7)
Fibrous hyperplasia	2 (0.7)
Focal epithelial hyperplasia	2 (0.7)
Dentoalveolar abscess	1 (0.3)
Mucous Pseudocyst	1 (0.3)
Aphthous stomatitis	1 (0.3)
Endodontic infection	1 (0.3)
Actinic cheilitis	1 (0.3)
Pyogenic granuloma	1 (0.3)
Total	136 (46.4)

diseases was influenced by age (Mann-Whitney test,  $p=0.193$ ), gender (Chi-square test,  $p=0.737$ ), tobacco (Chi-square test,  $p=0.384$ ) and diet (Chi-square test,  $p=0.181$ ). Only ankyloglossia showed a higher occurrence when compared to the other conditions (Chi-square test,  $p < 0.001$ ).

The most frequent alteration from normality was ankyloglossia, with 108 cases (37.1%), followed by benign migrant glossitis, 5 cases (1.7%); mandibular torus, 3 cases (1.0%) and lingual varicosity, tongue crenation, leukoedema and bone exostosis with only 1 case (0.3%). Four cases (1.4%) of viral diseases were detected, of which two cases (0.7%) were labial herpes simplex and two cases were focal epithelial hyperplasia (two female patients in the same family). Two Indians with mucocele (0.7%) and one case of aphthous stomatitis (0.3%) and one of actinic cheilitis (0.3%) were also observed.

With regards to reactional lesions, two patients with inflammatory fibrous hyperplasia (0.7%) were detected, besides one pyogenic granuloma (0.3%) in a pregnant patient, an individual with fibroma (0.3%), and one Indian with pulp polyp (0.3%) in a tooth with extensive crown destruction. Only 2 cases (0.7%) of chronic dentoalveolar abscess were detected.

All participants, or the adults responsible for the children participating, were informed about the results of the study and about their oral health conditions. The nature of the diseases observed was explained to them, as well as the relevance of the variations from normality detected, once they were not aware of their own oral conditions.

Ankyloglossia was the most common variation from normality identified (108 individuals or 37.1% of the population examined) and this condition is characterized by the inadequate insertion of the lingual frenulum, which consists of a dense fibrous conjunctive tissue and, occasionally, fibers of the genioglossus muscle. This is a condition in which the short frenulum, adhered to the lingual floor mucosa may produce, particularly in children, interference in feeding, mastication, and phonation (Messner *et al.*, 2000). Despite the high frequency of ankyloglossia, the problems associated with it, such as difficulties in phonation and in breastfeeding, irritation of the lingual frenulum or periodontal diseases (Queiroz Marchesan, 2004) were not detected, just formation of diastemas between the lower central incisors was observed in some patients. This turns unnecessary any collective surgical approaches that would decharacterize the population. The treatment for this condition depends on different factors, such as the intensity and type of the disturbances caused (Segal *et al.*, 2007), but generally consists of the total or partial removal of the frenulum (Messner & Lalakea, 2002; Queiroz Marchesan). The high prevalence of ankyloglossia in these ethnic groups should give rise to studies to characterize this population genetically, as in a great number of patients a familiar distribution of this clinical condition was observed. This aspect becomes relevant as it is known that natives living in the Umutina Indian Reservation descend from

small, fragmented and isolated groups that were transferred to that area over a hundred years ago by the Indian Protection Service, in order to avoid contact between the natives and pioneers who were coming into the headwaters of rivers Paraguay and Bugres. Thus, individual genetic characteristics may have become collective due to endogamy in a residual population, as has frequently been observed in those peoples.

Benign migrant glossitis was identified in five individuals. Although its etiology is still unknown, some authors suggest that the development of this variation from normality is related to environmental factors, diet, psychological disturbances and/or stress (Assimakopoulos *et al.*, 2002). However, stress and psychological problems do not seem to be related to the cases described here, as two of them occurred in children younger than three years old with a history of good life standards.

Regarding the viral infections identified, focal epithelial hyperplasia, which is not frequent in other populations but may be more frequent in Native American populations, is emphasized (Borborema-Santos *et al.*, 2006). In the cases diagnosed in the reservation, the surgical removal of one of the lesions, for histopathological examination, was carried out. Although surgical removal of these lesions is recommended by some authors (Durso *et al.*, 2005), most of these lesions showed spontaneous remission or did not grow up during the study. Since the lesion is a consequence of a viral infection, person-to-person transmission was suggested, as both cases were detected in a single family (Jayasooriya *et al.*, 2004). Few cases of reactional lesions were identified. In most occurrences, these lesions correspond to a response of the conjunctive tissue to an irritative factor, particularly trauma, in which local stress promotes the proliferation of fibroblasts and, consequently, an increase in the production of local collagen resulting in fibrous hyperplasia (Coelho & Zucoloto, 1999). In patients with poorly adapted total prosthesis, two cases of inflammatory fibrous hyperplasia were detected. Among the reactional lesions, pyogenic granuloma is generally associated to hormonal alterations due to pregnancy (Terezhalmay *et al.*, 2000).

The effects of those alterations on the microbiota of the dental biofilm, which is directly responsible for the aggression to the gingival tissues where those lesions develop, are still unknown. In this situation, gingival growth is observed, which may reach great dimensions or decrease after delivery (Silva-Souza *et*

*al.*, 2000). Only one case of actinic cheilitis was identified. However, as daytime fishing and activities in the reservation turn the Indians more prone to develop this condition, a greater number of cases was expected in that population. However, the melanic skin pigmentation, typical of the Brazilian Indian peoples living in the savanna-forest interface, where the intensity of ultraviolet radiation is very high, may represent a significant protection factor for this clinical condition.

Concerning the harmful habits observed in the population, a minority affirms to consume alcohol or tobacco, and majority of Indians who smoke were also verified to consume alcohol. Although there is strong evidence about the influence of tobacco and alcohol consumption on cancer incidence (Pelucchi *et al.*, 2008), particularly when those habits are concurrent, no case of oral cancer was detected in the population examined.

## CONCLUSION

After the analysis of the data, it was concluded that the occurrence of variations from normality, ankyloglossia in particular, possibly reflects ethnic-racial aspects of the population studied and, with the exception of dental and periodontal diseases, the native Brazilians living in the Umutina Indian Reservation in the State of Mato Grosso present good oral health conditions.

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**RESUMEN:** La ocurrencia de enfermedades y variaciones de normalidad son muy comunes en el complejo maxilofacial. Este fenómeno se asocia estrechamente a determinantes genéticos peculiares y son influenciados a través del aislamiento genético. Estudios sobre la distribución de enfermedad oral y variaciones de la normalidad en nativos Sudamericanos son generalmente dirigidos al estudio de la

caries dental en niños y enfermedad periodontal en adultos, dejando de lado una amplia gama de otras enfermedades orales. El objetivo de este estudio fue evaluar la distribución de lesiones y las variaciones anatómicas de normalidad en ocho grupos étnicos indígenas pertenecientes a la reserva Umutina, Estado de Mato Grosso, Brasil, a través del examen físico y oral, además de la evaluación citológica y valoración de dieta y hábitos como tabaco y consumo de alcohol. Un total de 291 indígenas de ambos sexos, con edades que van de 1 a 96 años fueron examinados, identificándose 132 variaciones de normalidad, evidenciando una alta ocurrencia de anquiloglosia, la cual se presentó en 108 casos (37,1%), seguido por glositis migratoria benigna en 5 casos (1,7%); torus mandibular y candidiasis en 3 casos (1,0%). Ninguna lesión maligna se identificó en la población.

**PALABRAS CLAVE:** poblaciones indígenas, diagnóstico, prevención de la enfermedad.

## REFERENCES

- Assimakopoulos, D.; Patrikakos, G.; Fotika, C. & Elisa, M. Benign migratory glossitis or geographic tongue: an enigmatic oral lesion. *Am. J. Med.*, 113:751-5, 2002.
- Borborema-Santos, C. M.; Castro, M. M.; Santos, P. J. B.; Talhari, S. & Astolfi-Filho, S. Oral focal epithelial hyperplasia: report of five cases. *Braz. Dent. J.*, 17:79-82, 2006.
- Coelho, C. M. & Zucoloto, S. Proliferative activity of denture-induced fibrous inflammatory hyperplasia analyzed by proliferating cell nuclear antigen labeling index. *Int. J. Prosthodont.*, 12:73-7, 1999.
- Dowsett, S. A.; Eckert, G. J. & Kowolik, M. J. Comparison of periodontal disease status of adults in two untreated indigenous population of Guatemala, Central America. *J. Clin. Periodontol.*, 29:784-7, 2002.
- Durso, B. C.; Pinto, J. M. V.; Junior, J. Jr. & Almeida, O. P. Extensive focal epithelial hyperplasia: case report. *J. Can. Dent. Assoc.*, 71:769-71, 2005.
- Jayasooriya, P. R.; Abeyratne, S.; Ranasinghe, A. W. & Tilakaratne, W. M. Focal epithelial hyperplasia (Heck's disease): report of two cases with PCR detection of human papillomavirus DNA. *Oral Dis.*, 4:240-3, 2004.
- Messner, A. H.; Lalakea, M. L.; Aby, J.; Macmahon, J. & Bair, E. Ankyloglossia incidence and associated feeding difficulties. *Arch. Otolaryngol. Head Neck Surg.*, 126(1):36-9, 2000.
- Messner, A. H. & Lalakea, M. L. The effect of ankyloglossia on speech in children. *Otolaryngol Head Neck Surg.*, 127:539-45, 2002.
- Pelucchi, C.; Gallus, S.; Garavello, W.; Bosetti, C. & La Vecchia, C. Alcohol and tobacco use, and cancer risk for upper aero digestive tract and liver. *Eur. J. Cancer Prev.*, 17:340-4, 2008.
- Queiroz Marchesan, I. Lingual frenulum: classification and speech interference. *Int. J. Orofacial Myology*, 30:31-8, 2004.
- Rigonatto, D. D. L.; Antunes, J. L. F. & Frazão, P. Dental caries experience in Indians of the Upper Xingu, Brazil. *Rev. Inst. Med. Trop. S. Paulo*, 43:93-8, 2001.
- Ronderos, M.; Pihlstrom, B. L. & Hodges, J. S. Periodontal disease among indigenous people in the Amazon rain forest. *J. Clin. Periodontol.*, 28:995-1003, 2001.
- Segal, L. M.; Stephenson, R.; Dawes, M. & Feldman, P. Prevalence, diagnosis and treatment of ankyloglossia. *Can. Fam. Physician.*, 53:1027-33, 2007.
- Silva-Souza, Y. T. C.; Coelho, C. M. P.; Brentegani, L. G.; Vieira, M. L. S. O. & Oliveira, M. L. Clinical and histological evaluation of *granuloma gravidicum*: case report. *Braz. Dent. J.*, 11:135-9, 2000.
- Terezhalmay, G. T.; Riley, C. K. & Moore, W. S. Pyogenic granuloma (pregnancy tumor). *Quintessence Int.*, 31:440-1, 2000.

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