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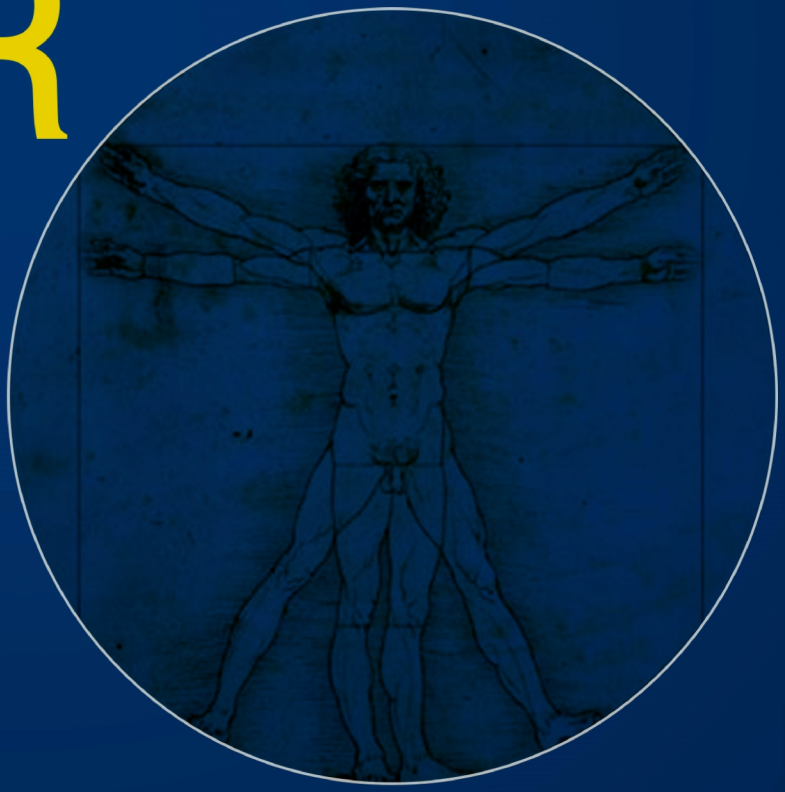

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Editorial

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A ***Master Editora*** *e o* ***BJSCR*** *agradecem aos Autores que abrilhantam esta edição pela confiança depositada em nosso periódico. O* ***BJSCR*** *é um dos primeiros "Open Access Journal" do Brasil, representando a materialização dos elevados ideais da* ***Master Editora*** *acerca da divulgação ampla e irrestrita do conhecimento científico produzido pelas Ciências da Saúde e Biológicas.*

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Our ninth edition, volume three, will be available in February, 2014!

Happy reading!

Mário dos Anjos Neto Filho
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Sumário summary

PREVALENCE OF DIABETES *MELLITUS* AND RISK FACTORS IN RESIDENTS OF "TAÚBAS" NEIGHBORHOOD IN IPATINGA MUNICIPALITY, STATE OF MINAS GERAIS, BRAZIL, IN 2014

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ABSTRACT

Diabetes *mellitus* is characterized as a metabolic disorder caused by the buildup of glucose in the bloodstream, caused by defects and / or action of the hormone insulin. To determine the prevalence of diabetes *mellitus* and risk factors in more than 18 residents in the neighborhood Taúbas - Ipatinga MG. We analyzed data from health unit to calculate the prevalence of the disease in the neighborhood, and home visits for application forms for identification of risk factors. 120 individuals were analyzed in the study. The prevalence of the disease was in the neighborhood of four diabetics for every 100 residents. The sample corresponds to 94 (78.3%) persons of the female gender and 26 (21.7%) were male. The most affected age group was 50-70 years. Obtain statistical association ($p \leq 0.05$) factors: genetic predisposition, with 63 (52.5%) individuals with dyslipidemia 21 (17.5%) and hypertension 51 (42.5%). No statistical association ($p > 0.05$) factors: smoking 13 (10.8%) individuals, sedentary 89 (74.2%), eating habits 50 (41.7%), coronary heart disease 15 (12.5 %), and BMI ≥25 85 (70.8%). Genetic predisposition has 3.5 times more likely to develop diabetes *mellitus*, dyslipidemia and hypertension has 7.3 times to 3.4 times. The prevalence was demonstrated lower than expected despite the majority of respondents presenting risk factors. Based on these results, it is suggested that new studies with larger populations to be made in order to accurately determine the prevalence of diabetes *mellitus* and risk factors.

KEYWORDS: Diabetes *mellitus*, prevalence, risk factors.

1. INTRODUCTION

Diabetes *mellitus* is a metabolic disorder of chronic disease, characterized by the accumulation of glucose in the bloodstream due to defects in the secretion and action of the hormone insulin. Currently this disease has emerged as a major public health problem because of its increasing prevalence in recent years, thus increasing its morbidity and mortality rates[1,2]. Studies show that the increasing prevalence of the disease is due to the rapid population aging and the industrialization and urbanization processes[3,4].

The Diabetes *mellitus,* which can be acquired or genetic cause is divided into four groups: Type 1, Type 2, gestational diabetes, among others. This classification was created by the American Diabetes Association and adopted by WHO and the Brazilian Society of Diabetes[2,5].

In type 1 diabetes is the destruction of pancreatic β cells, by some autoimmune process or unknown causes, the destruction of β cells will result in the total insulin deficiency in the individual, this type of diabetes is more commonly found in children, adolescents and adults young people. Diabetes type 2 is due to the default functionality and secretion of insulin, with a higher frequency in individuals over 40 years[1].

The development of gestational diabetes is characterized by hyperglycemia diagnosed during pregnancy. Other specific types of diabetes include the defects of genetic nature in the action of insulin and β cells, endocrine diseases, diabetes induced by drugs and other genetic syndromes related to Diabetes *mellitus*[1,5].

The Diabetes *mellitus* presented an increasing occurrence, studies show that the disease reached in 1995 about 4% of adults worldwide, and will focus in 2025 about 5.4% of the population. Studies also show that 50% of the diabetic population is unaware of the presence of the disease and the correct diagnosis is made only after the manifestations of signs and symptoms. Therefore the completion of the screening test in asymptomatic patients who have risk for developing the disease is of paramount importance[1,6,7].

The risk factors for the development of disease are: genetic predisposition, age over 50 years, gender, BMI or equal to 25, dyslipidemia, smoking, alcoholism, hypertension, physical inactivity, coronary heart disease and eating habits. Statistics data about the Diabetes *mellitus* is essential to develop health programs aimed at

prevention, counseling, diagnosis and treatment of affected[2,8,9].

The city of Ipatinga is located to the east of Minas Gerais State, in the metropolitan region of the Steel Valley, the Doce River Basin. Located about 235 km away from Belo Horizonte, the principal city[10]. Its population according to the last IBGE census in 2010 comprises of 239,468 inhabitants, has as estimated population for the year 2014 of 255,266 inhabitants. With the land area of 164,884 km² its population density covers about 1452.34 inhab./ Km², and has 35 neighborhoods. Among them, the Taúbas neighborhood used in the research, located in regional VI, composed of about 467 individuals living on site[11]. Given the increasing public health problem that Diabetes *mellitus* presents the population, this study aims to determine the prevalence of diabetes *mellitus* and its risk factors in residents aged over 18 years Taúbas neighborhood in Ipatinga - MG, registered in the Program "Family Health" in 2014.

2. MATERIAL AND METHODS

The research it is a cross-sectional descriptive observational study of quantitative nature, conducted from September 9 to October 24.

This research project was submitted to the Ethics Committee of the Hospital of the Whale/ Benjamin Guimarães Foundation, voucher number: 087176/2014, CAAE: 36874414.9.0000.5123, ethical standards with regard to research involving human beings in Resolution 196/96 of the National Health Council, especially with regard to the implementation of the Consent and Informed participants, as well as, the secrecy and confidentiality data were followed.

The data to determine the prevalence of diabetes *mellitus* were provided by the local health unit, this unit serving other two neighborhoods beyond Taúbas. To determine the prevalence of risk factors, home visits were carried out by the health care provider for the implementation of the forms in which information was obtained on the number of risk factors are: gender, age, dyslipidemia, BMI or equal to 25, genetic predisposition, smoking, alcohol consumption, hypertension, physical inactivity, coronary heart disease and eating habits[2,8,9]. To help BMI calculation was used portable weighing up to 120 pounds to investigate the weight of research and tape measure participants to determine the height.

The applied forms had nine closed questions and organized in thematic groups in order, namely on: name, gender, age, weight and height, eating habits, physical activity, dyslipidemia, coronary heart disease, smoking, alcohol consumption and genetic predisposition. The names of the patients were coded to avoid the subject's exposure and facilitate the handling of the data obtained with these reviewed by each researcher. All data and results obtained in this work will be used only for research purposes as well as to achieve their goals.

Only individuals participated in the survey residents Taúbas neighborhood in Ipatinga - MG registered in the Program "Family Health", 18 years and signed the Informed Consent Statement. Smaller inhabitants of 18, missing from home individuals at the time of the visit and individuals who refused to participate in the study, were excluded with respect to the prevalence of risk factors.

The total sample for estimating the prevalence of the disease consists of 574 individuals from 170 families; the data for the total sample was provided by the health department and comprises all individuals living in the neighborhood of registered PSF. In all the forms were applied to 120 people from 89 households, (56%) residents of the neighborhood of 71 households (44%) had no residents on the fly. In 10 households, there were no residents.

Data analysis was performed using statistical calculations where the prevalence of the total population was calculated registered in the program "Family Health" and the average was calculated using data obtained during home visits. To investigate the association statistics of the risk factors we used chi-square test with 95% confidence interval, assuming thereby a significance level of 5% ($p \leqslant 0.05$). The strength of association was measured by Relative Odds (RO), due to the small number of affected in the sample.

3. RESULTS

The prevalence found in the study was four for each top 100 inhabitants of 18 years. Of the total sample females corresponds to 94 women (78.3%) and males to 26 men (21.7%). The most affected age group is 50-70 years, mean 52 years old. The prevalence of risk factors, presence and absence of statistical association are shown in (Table 1).

Table 1. Prevalence of risk factors and analysis of statistical association of variables.

Analysis of risk factors studied							
Variables	Diabetic		Non-diabetic		Total		Chi-square x^2
	n	%	n	%	n	%	
Genetic Predisposition							
Yes	16	13.3	47	39.2	63	52.5	≤0.05
No	5	4.2	52	43.3	57	47.5	
Age							
> 50 years	14	11.7	50	41.7	64	53.3	≥0.05
≤ 50 years	7	5.8	49	40.8	56	46.7	
Gender							
Female	14	11.7	80	66.7	94	78.3	≥0.05
Male	7	5.8	19	15.8	26	21.7	
BMI							
< 25	4	3.3	31	25.8	35	29.2	≥0.05

≥ 25	17	14.2	68	56.7	85	70.8	
Dyslipidemia							
Yes	10	8.3	11	9.2	21	17.5	≤0.05
No	11	9.2	88	73.3	99	82.5	
Smoking							
Yes	3	2.5	10	8.3	13	10.8	≥0.05
No	18	15.0	89	74.2	107	89.2	
Alcoholism							
Yes	0	0.0	15	12.5	15	12.5	*
No	21	17.5	84	70.0	105	87.5	
Hypertension							
Has SAH	14	11.7	37	30.8	51	42.5	≤0.05
Has no SAH	7	5,8	62	51,7	69	57,5	
Sedentarism							
Sedentary	15	12.5	74	61.7	89	74.2	≥0.05
Non-Sedentary	6	5.0	25	20.8	31	25.8	
Coronary Artery Disease							
Yes	4	3.3	11	9.2	15	12.5	≥0.05
No	17	14,2	88	73,3	105	87,5	
Food habits							
Healthy	12	10.0	38	31.7	50	41.7	≥0.05
Non-Healthy	9	7.5	61	50.8	70	58.3	

* Could not calculate the chi-square, as the number of affected by the variable is 0.

Note that the risk factors analyzed was obtained statistical association (p = 0.05) only the genetic predisposition factors, dyslipidemia and hypertension. The genetic risk factor predisposing corresponds to 63 (52.5%) of the total population studied subjects, 16 (13.3%) diabetic patients and 47 (39.2%) non-diabetic patients, 21 (17.5%) individuals the studied population has some type of dyslipidemia which 10 (8.3%) are diabetic and 11 (9.2%) non-diabetics. Hypertension affects 51 (42.5%) individuals in the population; these figure, 14 (11.7%) individuals are diabetic and 37 (30.8%) non-diabetics.

The risk factors that showed no statistical association (p≥0,05) were smoking, sedentary lifestyle, eating habits, coronary heart disease, BMI greater than or equal 25, the age of 50 years and gender. Smoking acomete13 individuals (10.8%) of the total population studied, where three (2.5%) are diabetic and 10 (8.3%) non-diabetics. Individuals over age 50 account for 64 (53.3%) patients of the total research participant population of the value of 14 (11.7%) are diabetic and 50 (41.7%) of non-diabetics. Regarding the variable alcohol consumption, could not be verified association due to the fact the number of affected by diabetes *mellitus* be null.

It was observed that 15 patients (12.5%) of the population has some type of coronary disease, this total four (3.3%) are diabetic and 11 (9.2%) are not diabetic. In eating habits it was noted that 12 individuals (10%) of diabetic and 38 (31.7%) of the non-diabetic population. The population have healthy eating habits, while nine patients (7.5%) who have diabetes and 61 (50.8%) of those who do not have diabetes do not have healthy eating habits.

Subjects with a BMI greater than or equal to 25 account for 17 subjects, which (14.2%) were diabetic and 68 (56.7%) were non-diabetic patients. Its results show that 4 (3.3%) diabetics subjects and 31 (25.8%) non-diabetics subjects have a BMI less than 25. In the group, 94 subjects (78.3%) of the interviewed population are females where 14 (11.7%) had diabetes *mellitus* and 80 (66.7%) did not have the disease, the male corresponds to 26 individuals (21.7%) of the total population interviewed, this value seven (5.8%) are diabetic and 19 (15.8%) non-diabetic subjects.

Through calculations to investigate the strength of association was observed that individuals with dyslipidemia show 7.3 times more likely to develop diabetes of which do not have dyslipidemia. It comes to genetic predisposition, individuals who have a family member with diabetes have 3.5 times more likely to develop the disease than those who have no family with the disease. The presence of hypertension increases 3.4 times more likely to develop diabetes than individuals who do not have hypertension (Figure 1).

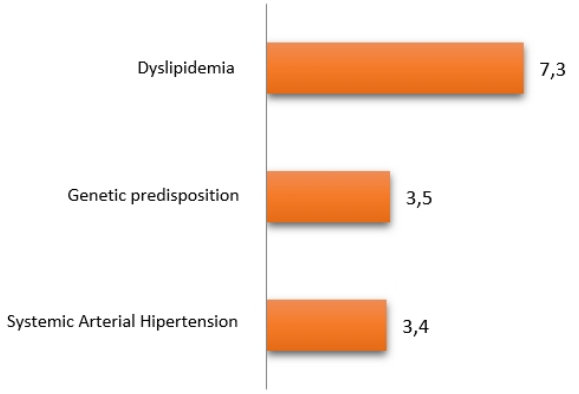

Figure 1. Strength of association between the risk factors for developing diabetes *mellitus*.

4. DISCUSSION

The results of the survey enabled us to identify a prevalence lower than expected, with 4% of value. Freitas & Garcia (2012)[12] has identified an approximate prevalence of 5% of the Brazilian population po-demonstrating consistency with the data obtained in the study performed. However Days & Campos (2012)[13] argue that the prevalence of diabetes *mellitus* in Brazil there was a sharp increase, with over 10% in most of the bra-ian states in the 2002-2007 period.

In the survey the genetic predisposition factor is present in 13.3% of diabetic patients in the survey, the result is proven by Souza *et al.* (2003)[14], wherein the factor affects 10% of the diabetic population studied. Medeiros *et al.* (2012)[9] stated that individuals who have first-degree relatives is two to six times more likely to develop diabetes. In research conducted in Taúbas

neighborhood was observed using statistical calculations that individuals who have a family member with the disease are 3.5 times more likely to develop diabetes with respect to those who have no family with that disease.

Though it lacks statistical association study conducted in individuals aged over 50 years are more affected by the disease since the study population 11.7% of diabetics have the age of 50 years and only 5.8% have the age of 50 years. Freitas & Garcia (2012)[12] observed in their study that the age group most affected by the disease was 70-79 years old. The authors also state that the prevalence rate has greater significance in people aged 40-79 years with no differences regarding gender.

Although other studies have shown a higher frequency of diabetes in female subjects[14,15], conducted the study had a higher prevalence of diabetes in male persons. In research conducted by Pinto & Moretto (2004)[16] in outpatients, the prevalence of diabetes *mellitus* was higher in males. However, after 50 years of age, the prevalence found himself pronounced in females, the authors claim that the fact that the prevalence is more pronounced in individuals older than 50 years hence increases the risk of morbidity and mortality in this group age. Ortiz & Zanetti (2001)[15] point out that the prevalence of the disease in women has no great significance, as the prevalence of diabetes *mellitus* is 1.4 to 1.8 times more frequent in females than in males.

Despite the BMI variable has no statistical association in our study we found 14.2% of diabetic patients with BMI 25 and above in while only 3.3% of diabetics have lower BMI than 25. In research conducted by Ortiz & Zanetti (2001)[15], 51.5% of study participants is in a frame overweight or obese. In Souza *et al.* (2003)[14] is also depicted that obesity is a factor in the development of diabetes *mellitus*.

It was noted in this study the presence of statistical association regarding the variable dyslipidemia and hypertension, showing that such variables are risk factors for developing diabetes *mellitus*. Souza *et al.* (2003)[14] confirm this association through a study conducted in Rio de Janeiro, in which state that high blood pressure and dyslipidemia are in fact risk factors for developing the disease, and the prevalence of diabetes *mellitus* in more expressive individuals which has some of these factors. Lyra *et al.* (2010)[17] that 20% to 60% of diabetic patients have hypertension, pre-valence was found by the authors one to three times higher in people who have diabetes *mellitus* in relation to those who do not have the disease.

Francis *et al.* (2010) 8 say that the significant prevalence of hypertension in diabetic patients due to the fact thereof is connected to the increasing degree of insulin resistance in addition to the worse hypertensive medications used by this resistance framework, making the carrier more prone hypertension developing Diabetes *mellitus*.

Sedentary lifestyle no significant statistical association in going from line study to research conducted by Medeiros *et al.* (2012)[9]. Lyra *et al.* (2010)[17] argue that physical inactivity is related to insulin resistance in people without diabetes *mellitus*, in the study conducted by the authors said variable was not related, stating that physical exercise increases the amount of muscle fibers and capillaries, assisting the functionality of the insulin-mediated glucose on the abovementioned cells.

Thus, it is observed that the variable sedentary lifestyle despite having no statistical association is considered a risk factor for the development of diabetes *mellitus*. For the physical activity is beneficial to health it must be carried out continuously with a suitable degree of intensity to each individual[18].

Regarding smoking, the variable showed no statistical significance. These results are in agreement with the findings by Moraes *et al.* (2010)[7], the study in São Paulo in which he states that the association of this variable with diabetes *mellitus* presented with conflicting results in the literature making this little fact clear. Smoking adds the chronic complications of diabetes *mellitus*, thus bringing health hazards both independently as associated with other factors[16]. Another variable that was not statistically significant was the presence of coronary heart disease, the result is contradictory in the study of Francis *et al.* (2010)[8], where it was found statistically significant factor that affects 21% to 15% of the study population.

In the data analysis showed that the variable diet was not statistically significant, one reason for the data found is that the diabetic population already have a balanced diet due to illness, it was observed that most of the non-diabetic patients have had a healthy diet. Brito *et al.* (2009)[19], shown in his research that 73.49 % of diabetic respondents in the study do not have healthy eating habits, the authors also stress the importance of having a balanced diabetic individuals and fractional power.

5. CONCLUSION

In conclusion, this study showed a prevalence rate lower than expected, this shows that much of the population studied, despite not having healthy eating habits and be mostly sedentary, do not have diabetes *mellitus*.

Most of the participants of the study population had at least two risk factors for the development of diabetes *mellitus*. We suggest the implementation of awareness campaigns with regard to the practice of promoting healthy habits, such as the practice of physical activity and eating habits appropriate to the needs of each individual, because much of this population still unaware the importance of prevention, monitoring and control of the disease.

The monitoring of the health status of the population studied is extremely necessary for there to be an early and accurate diagnosis of the disease in order to reduce morbidity and mortality caused by the disease. Given, these results suggest the new studies with populations of more individuals and covering not only individuals older than 18 years in order to accurately determine the prevalence of diabetes *mellitus* and its risk factors.

REFERENCES

[01] Shwetz, Cobas RA, Gomes MB de. Diabetes *Mellitus*. Rev do Hospital Universitário Pedro Ernesto**.** 2010; 9 (1):69-75.

[02] Brasil. Ministério da saúde (MS). Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Estratégias para o cuidado da pessoa com doença crônica: diabetes *mellitus*. Brasília: Ministério da saúde (MS); 2013.

[03] Sociedade Brasileira de Diabetes. Diretrizes da Sociedade Brasileira de Diabetes:2013-2014. São Paulo: AC Farmacêutica; 2014.

[04] Schmidt MI, Duncan BB, Hoffmann JF, Moura L, Malta DC, Carvalho RMSV de. Prevalência de diabetes e hipertensão no Brasil baseada em inquérito de morbidadeauto-referida, Brasil, 2006. Rev. Saúde Pública. 2009; 43(2):74-82

[05] Smeltzer SC, Bare BG, Hinkle JL, Cheever KH. Tratado de Enfermagem Médico-Cirúrgica. 10. Ed. Rio de Janeiro: Guanabara Koogan; 2009. 1158-214.

[06] King H, Aubert RE, Hernan WH. Global burden of diabetes, 1995-2025: prevalence, numerical estimates, and projections. Diabetes Care. 1998; 21(9): 1414-31.

[07] Moraes SA, Freitas ICM de, Gimeno SGA, Mondini L. Prevalência de diabetes *mellitus* e identificação de fatores associados em adultos residentes em área urbana de Ribeirão Preto, São Paulo, Brasil, 2006: Projeto OBEDIARP. Cad Saúde Pública. 2010 maio; 26(5):929-41.

[08] Francisco PMSB, Belon AP, Barros MBA de, Carandina L, Alves MCGP, Goldbaum M, *et al*. Diabetes auto-referido em idosos: prevalência, fatores associados e práticas de controle. Cad Saúde Pública. 2010 jan; 26(1):175-84.

[09] Medeiros CCM, Bessa GC, Coura AS, França ISX de, Sousas FS de. Prevalência dos fatores de risco para diabetes *mellitus* de servidores públicos. Rev Eletrônica de Enfermagem. 2012 jul-set; 14(3):559-69.

[10] Freitas GVR. Entre divisas, divisores e um massacre: A emancipação da não construída cidade de Ipatinga-MG [dissertação de mestrado]. Uberlândia: Universidade Federal de Uberlândia; 2011.

[11] IBGE – Instituto Brasileiro de Geografia e Estatística [homepage na internet]. Rio de Janeiro: Censo demográfico 2010 – Resultados da amostra; c2010 [acesso em 2014 out 25]. Disponível em: http://www.cidades.ibge.gov.br/xtras/perfil.php?lang=&codmun=313130&search=minas-gerais|ipatinga

[12] Freitas LRS de, Garcia LP. Evolução da prevalência do diabetes e deste associado à hipertensão arterial no Brasil: análise da Pesquisa Nacional por Amostra de Domicílios, 1998, 2003 e 2008. EpidemiolServ Saúde. 2012 jan-mar; 21(1):7-19.

[13] Dias JCR, Campos JADB. Diabetes *mellitus*: razão de prevalências nas diferentes regiões geográficas no Brasil, 2002 – 2007.Ciênc. saúde colet. 2012; 17(1):239-44.

[14] Souza LJ de, Chalita FEB, Reis AFF, Teixeira CL, Neto CG, Bastos DA,*et al.* Prevalência de Diabetes *Mellitus* e Fatores de Risco em Campos dos Goytacazes, RJ. ArqBrasEndocrinolMetab. 2003 fev; 47(1):69-74.

[15] Ortiz MCA, Zanetti ML. Levantamento dos fatores de risco para diabetes *mellitus* tipo 2 em uma instituição de ensino superior. Rev Latino-am Enfermagem. 2001 maio; 9(3):58-63.

[16] Pinto AB, Moretto MB. Diabetes *mellitus* e fatores de risco em pacientes ambulatoriais. NewsLab. 2004; 66: 106-118.

[17] Lyra R, Silva RS dos, Montenegro Jr RM, Matos MVC, Cézar NJB, Silva LM da. Prevalência de diabetes melito e fatores associados em população urbana adulta de baixa escolaridade e renda do sertão nordestino brasileiro. ArqBrasEndocrinolMetab. 2010; 54(6):560-66.

[18] Almeida VCF de, Zanetti ML, Almeida PC de, Damasceno MMC. Ocupação e fatores de risco para diabetes tipo 2: estudo com trabalhadores de enfermagem. Rev. Latino-Am. Enfermagem. 2011 maio-jun; 19(3):[09 telas].

[19] Brito KM de, Buzo RAC, Salado GA. Estilo de vida e hábitos alimentares de pacientes diabéticos. Rev Saúde e Pesquisa. 2009 set-dez; 2(3):357-62.

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JUVENILE SEXUAL ABUSE: PROFILE OF THE ALLEGED VICTIMS ATTENDED AT THE FORENSIC MEDICAL INSTITUTE IN BELO HORIZONTE, BRAZIL

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ABSTRACT

To analyze comparatively the profile of the alleged victims of sexual abuse in children under 18 attended at the Forensic Medical Institute of Belo Horizonte (IML-BH), Minas Gerais, Brazil. We conducted a cross-sectional study based on the forensic reports performed in IML-BH with victims under 18 suspected of sexual abuse attended between December 2007 and March 2012. During the study period 2071 medical investigations were conducted in under 18-year-old alleged victims of sexual abuse. In total, 58.5% were children and 41.5% were teenagers, mostly females (81.6%). Concerning the alleged abusers, there was a higher prevalence of men (97.4%). The most prevalent topography found in these cases was the upper limbs in both genders. Swab was collected during search for semen e in 35.1% of cases. Of these, only those collected within 48 hours after the abuse and in vaginal and anal topography tested positive. Compared with adolescents, children are more likely to be abused. Males have a higher risk of victimization than those of female gender in relation to children age group, however, the contrary happens in the juvenile age group.
eaking a cultural taboo of man in relation to care of your health.

KEYWORDS: Sexual abuse, child violence, violence.

1. INTRODUCTION

The juvenile sexual abuse is the involvement of children and adolescents in sexual activity who do not have full understanding of the action or are forbidden or unable to consent to such action. It is clear observed when there is a relationship between the victim and a suspect in relation to superiority, which may be based on responsibility, trust or power of the abuser over the abused[1,2].

The Pan American Health Organization estimates that, worldwide, 36% of girls and 29% of boys have experienced some kind of sexual abuse[1]. Accurate statistics on the prevalence of juvenile abuse are difficult to obtain due to underreporting and therefore several studies deem it as unknown[3]. This type of violence is a serious public health problem[1,4-7]. Therefore, profiling the victim according to gender, age, place of aggression, the relationship with the aggressor, physical injuries when present in the expertise and the abuser's profile are crucial to outline strategies for prevention and intervention[1].

Thus, this study aimed to determine and analyze the profile of under 18-year-olds allegedly victims of sexual violence who were attended at IML-BH from January 2007 to December 2012.

2. MATERIAL AND MÉTHODS

This study is a retrospective analysis of 2071 expertise *in vivo*, held at (IML-BH) the Forensic Medical Institute in Belo Horizonte, from January 2007 to December 2012, with under 18-year-olds.

In Brazil, the forensic medical examination is performed as part of an inquiry of a police investigation. As this study was based exclusively on the expert reports and not on the final result of the inquiry or the trial court under discussion, we consider the term "alleged" for both the victims and the aggressors.

It was investigated the profile of those alleged victims regarding age, gender, place of aggression, degree of intimacy with the suspect, the presence or absence of neurological deficits or psychiatric disorders in the victims and characteristics of injuries (if present).

3. RESULTS

The total sample (n=2071 examinations), 1212 (58.5%) were children, 859 (41.5%), teenagers and the average age was 9.7 for females and 8.1 for males. Regarding the victims' gender, 1691 (81.6%) were girls and 380 (18.4%) boys. On the other hand, when it comes to the alleged abuser's gender, which was present in 1374 examinations, it is a reverse with 1339 (97.4%) men and 35 (2.6%) women. In relation to cognitive/ psychiatric deficit issue, the alleged male victims, compared to female, had 2.99 times higher relative risk of having some degree of deficit according to expert examination (Table 1).

Table 1. Analysis of the characteristics of alleged sexual abuse by the gender of the alleged victims.

Characteristics	Male		Female		Total		IC	RR	P Value
	N	(%)	N	(%)	N	(%)			
Age group									
Chldren	285	75.0	927	54.8	1212	58.5			
Adolescents	95	25.0	764	45.2	859	41.5			
Total	**380**	**100.0**	**1691**	**100.0**	**2071**	**100.0**	**1.25-1.49**	**1.36**	**<0.001**
Abuser									
Male	230	96.2	1109	97.7	1339	97.4			
Female	9	3.8	26	2.3	35	2.6			
Total	**239**	**100.0**	**1135**	**100.00**	**1374**	**100.00**	**0.86-1.03**	**0.94**	**0.1884**
Cognitive and psychiatric disorder									
Yes	13	3.8	20	1.3	33	1.7			
No	325	96.2	1534	98.7	1859	98.3			
Total	**338**	**100.0**	**1554**	**100.0**	**1892**	**100.0**	**1.75-5.00**	**2.99**	**<0.001**

* Chi-square significant at 5% of significance.

The most common alleged abuser was the biological father followed by stepfather, unknown and uncle. Of the total 394 reports which made reference to the crime scene, 144 (36.5%) occurred at the abuser's home, 29 (7.4%) at the abuser's relative's home, and 84 (21.3%) on street (a public area).

Table 2. Distribution of the degree of intimacy of the alleged abuser.

Characteristics	Male		Female		Total		P Value
	N	(%)	N	(%)	N	(%)	
Degree of intimacy of the abuser							
Father	39	18.6	170	17.6	209	17.7	
Stepparent	16	7.6	157	16.2	173	14.7	
Uncle/Aunt	14	6.7	85	8.8	99	8.5	
Sibling	8	3.8	21	2.2	29	2.5	
Cousing	16	7.6	47	4.8	63	5.4	
Grandparent	5	2.4	33	3.4	38	3.3	
Neighbour	23	11.0	65	6.7	88	7.5	
Teacher	4	1.9	7	0.7	11	0.9	
Unknown	27	12.8	141	14.6	168	13.9	
Others	58	27.6	242	25.0	300	25.6	
Total	**210**	**100.00**	**968**	**100.00**	**1178**	**100.00**	**0.0400**

* Chi -square significant at 5% of significance.

In the database analyzed, it was available the description of the medical-forensic examination findings in 1862 (89.9%) out of 2071 examinations of alleged abused. Out of these, 319 (17.1%) were extragenital injuries: abrasions, bruises and petechiae, in which the most affected anatomical topography was the upper limbs: 52 (16.3%). Allegedly abused children, in comparison to adolescents, have a 1.23 time lower risk of presenting external lesion in an examination (Tables 3 and 4).

Table 3. Analysis of lesions by the age group of the alleged sexual violence victims.

	Children		Adolescents		Total		IC	RR	P Value
	N	(%)	N	(%)	N	(%)			
External lesions									
Presence of lesions	169	15.4	150	19.3	319	17.1			
Absence of lesions	915	84.6	628	80.7	1543	82.9			
Total	**1082**	**100.0**	**778**	**100.0**	**1862**	**100.0**	**0.65-0.98**	**0.81**	**0.0372**
Male Genital Lesion									
Presence of lesions	5	33.3	1	8.3	6	22.2			
Absence of lesions	10	66.7	11	91.7	21	77.8			
Total	**15**	**100.0**	**12**	**100.0**	**27**	**100.0**	**0.7-22.62**	**4.01**	**0.1205**
Female Genital Lesion–Hymen									
Presenceof rupture-and/orlesions	54	6.4	199	29.7	253	16.7			
Absence of rupture and/or lesions	785	93.6	472	70.3	1257	83.3			
Total	**839**	**100.0**	**671**	**100.0**	**1510**	**100.0**	**0.18-0.26**	**0.21**	**<0.001**

* Chi-square significant at 5% of significance.

Table 4. Distribution of lesion by the age group of the sexual violence alleged victims.

Caracte	Children		Adolescents		Total		Valor P
	N	(%)	N	(%)	N	(%)	
Location of external lesions							
Pectoral region	4	2.4	13	8.66	17	5.33	
Thighs	17	10.0	10	6.67	27	8.46	
Legs	32	18.9	13	8.66	45	14.11	
UL (MMSS)	21	12.4	31	20.67	52	16.30	
Cervical region	3	1.8	24	16.00	27	8.46	
Cephalic region	26	15.4	13	8.66	39	12.23	
Abdomen	5	2.9	4	2.67	9	2.82	
Back	6	3.5	6	0.40	12	3.76	
Gluteal region	8	4.7	1	0.67	9	2.82	
2 or more segments	47	27.8	35	23.34	82	25.70	
Total	**169**	**100.0**	**150**	**100.00**	**319**	**100.00**	**0.0001**
Female genitalia lesions – Hymen							
Intact	785	93.0	472	70.3	1257	83.2	
Intact with lesions	25	3.1	14	2.2	39	2.6	
Recent rupture	19	2.7	32	4.7	51	3.4	
Former rupture	10	1.2	153	22.8	163	10.8	
Total	**839**	**100.0**	**671**	**100.0**	**1510**	**100.0**	**0.0001**

* Chi-square significant at 5% of significance.

A gynecological evaluation of hymens revealed that 1257 (83.2%) were intact, and the victims under 12,

compared to the older victims, were 4.75 times less likely to have an injury. Adolescents demonstrated higher prevalence for this variation: 32 (4.7%) with recent ruptures and 153 (22.8%), old ones. However, this is a reverse in children, with respectively 19 (2.7%) and 10 (1.2%).

The "swab" examination process to identify the semen occurred in 631 alleged victims. Children who were allegedly abused, compared with adolescents, are 2.95 times less likely to be submitted to swab, and, when submitted, had 4.5 times lower chance of positivity (Tables 5 and 6).

Table 5. Time analysis between the alleged abuse and the forensic examination and swab collection for semen search by age of the alleged sexual violence victims.

Characteristics	Children		Adolescents		Total		IC	RR	P Value
	N	(%)	N	(%)	N	(%)			
Period of abuse to forensic exam									
< 72 h	312	45.4	299	47.2	611	46.3			
> 72 h	375	54.6	335	52.8	710	53.7			
Total	**687**	**100.0**	**634**	**100.0**	**1321**	**100.0**	**0.87 - 1.06**	**0.96**	**0.5249**
Swabs collection for semen									
Presence of collection	198	19.3	433	56.3	631	35.1			
Absence of collection	828	80.7	337	43.7	1165	64.9			
Total	**1026**	**100.0**	**770**	**100.0**	**1796**	**100.0**	**0.29 - 0.38**	**0.34**	**<0.001**
Swabs collection result									
Positive	4	2.2	41	9.9	45	7.6			
Negative	176	97.8	371	90.1	547	92.4			
Total	**180**	**100.0**	**452**	**100.0**	**592**	**100.0**	**0.10 - 0.48**	**0.22**	**<0.001**

* Chi-square significant at 5% of significance.

Table 6. Distribution of vaginal and anal swabs results for semen according to the elapsed time between the alleged abuse and the collection.

Characteristics	< 24 hours		24 - 48 hours		48 – 72 hours		> 72 hours		Total		P Value (Wald test)
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	
Vaginal swab											
Positive for semen	42	21.3	2	5.88	0	0	0	0	44	11.08	
Negative for semen	155	78.7	32	94.12	20	100.00	146	100.00	353	88.92	
Total	**197**	**100.0**	**34**	**100.00**	**20**	**100.00**	**146**	**100.00**	**397**	**100.00**	**0.001**
Anorectal swab											
Positive for semen	1	5.3	0	0	0	0	0	0	1	1.7	
Negative for semen	19	94.7	5	100.0	3	100.0	30	100.0	57	98.3	
Total	**20**	**100.0**	**5**	**100.0**	**3**	**100.0**	**30**	**100.0**	**58**	**100.0**	**0.998**

* Chi-square significant at 5% of significance.

4. DISCUSSION

In line with other authors[6,8-10], the results showed a higher incidence of alleged sexual abuse in females. The lower rate in men may be attributed, in part, to social behavioral factors and greater ability to self defense when compared to girls, with consequent underreporting cases[11]. Moreover, these start to present more exuberant secondary sexual features, which is a possible attractive to the alleged abuser. Regarding age, 58.5% of the alleged victims were younger than 12, and this percentage increased when compared to the literature[8,12,13].

Considering the alleged abuser profile, they are usually men who have some kind of bond with the child, being a parent as the most common type, which corroborates the literature[3,6-9,11,12]. This scenario reinforces the idea of female subordination over male, especially in children, and it still suggests the existence of a trust relationship between the alleged victim and the agressor[3,6,11] Therefore, the abuse can go unnoticed by both the child and those who surround him/her.

Regarding the place of the alleged offense, the victim's own home was presented as the most prevalent scenario[3,12,13]. This finding has a possible correlation with the degree of intimacy between the abuser and the victim, since it is an environment where the child feels safe and there is enough time to build a bond and the consummation of the act.

This study also revealed that 1.7% of the alleged victims had some psychiatric cognitive impairment, which is considered a risk factor for victimization[1,14].

The examinations performed found external lesions only in 17.1% of cases, which can be explained by the fact that most of sexual acts do not produce physical injuries diagnosed by forensic examination. Furthermore, the alleged abuser tends not to leave traces in order to perpetuate the action. The low prevalence of external lesions in our study is lower than the values found by other autores[6,7,15], which can be explained partly by the lack of standardization of expert description in Brazil and the limitation of forensic examination for the diagnosis of exempt acts of physical findings.

The highest incidence of lesions in upper limbs can be related to self-defense reaction. However, most of these findings are nonspecific, such as abrasions, bruises and petechiae. These external injuries were more frequent than genital, a corroborated fact by Stefanie *et al.* (2010)[15]. Therefore, despite being a sexual crime, genital lesions are not always present, a fact related to the nature of the sexual acts perpetrated against children and the high capacity of this cell regeneration area[1,2,16].

In some studies it was observed that genital abnormalities found in forensic examinations are more common in prepubertal children due to low concentration of estrogen and therefore less elasticity and thickness of tissues[1,2]. However, in this study, these lesions were more prevalent in adolescents. This discrepancy may be explained by the fact that among over 14-year-olds, usually, the sexual activity is already something previously

experienced in Brazil and also backed by our legislation (the average age of initiation in sexual activity , in Brazil, is 14.9 years-old)[17].

The swab semen result has inverse correlation with the time between sample collection and the abuse [2,11,18,19] The American Association of Pediatrics recommends that the material collection should be preferably done within 72 hours after the abuse, being more effective in the first 24 hours[16,19]. In the present study, there were no positive swabs after 48 hours, which confirms the importance of this research's early performance.

5. CONCLUSION

This study concluded that, compared to adolescents, children are more likely to be abused, both in females as in males. In addition, males have a higher risk of victimization than females when compared during children age, and this relationship is reversed in the juvenile age group. Children are less submitted to the swab test for semen than teenagers and when they are, in their majority, the results are negative. Therefore, the incorporation of more specific care protocols could improve costing, customer service and resolution of alleged juvenile sexual abuse cases.

REFERENCES

[1] Dini World Health Organization. Guidelines for medico-legal care for victims of sexual violence, Geneva, 2010.

[2] Sakelliadis EI, Spiliopoulou CA, Papadodima SA. Forensic investigation of child victim with sexual abuse. Indian Pediatr. 2009; 46(2):144-51

[3] Martins CBG, Jorge MHPM. Abuso sexual na infância e adolescência: perfil das vítimas e agressores em município do sul do Brasil. Texto & Contexto - Enferm. 2010; 19(2):246-55.

[4] Abrapia. Abuso sexual: mitos e realidade. 3 ed. Petrópolis, RJ: Autores & Agentes & Associados. 2002; 62.

[5] Habigzang LF, Koller SH, Azevedo GA, Machado PX. Abuso sexual infantil e dinâmica familiar: aspectos observados em processos jurídicos. Psic Teor e Pesq. 2005; 21(3):341-8.

[6] Taveira F, Frazão S, Dias R, Matos E, Magalhães T. O abuso sexual intra e extra-familiar. Acta Méd Port. 2009; 22(6):759-66.

[7] Drezett J. et al. Influência do exame médico-legal na responsabilização do autor da violência sexual contra adolescentes. Rev Bras Cresc e Desenv Hum. 2011; 21(2):189-97.

[8] Modelli ME, Galvão MF, Pratesi R. Child sexual abuse. ForensicSci Int. 2012; 217(1-3):1-4.

[9] Aded NLO, Dalcin BLGS, Moraes TM, Cavalcanti MT. Abuso sexual em crianças e adolescentes: revisão de 100 anos de literatura. Revpsiquiatr clín. 2006;33(4):204-213.

[10] França, GV. Medicina Legal. 9ª ed. Rio de Janeiro: Guanabara Koogan; 2008; 736.

[11] Hagras AM, MoustafaSM, Barakat HN, El-Elemi AH. Medico-Legal evaluation of child sexual abuse over a six year period from 2004 to 2009 in the Suez Canal area, Egypt. Egyp Journ of Forens Scienc.2011; 1(1):58-66.

[12] Guimarães, JATL, Villela WV. Características da violência física e sexual contra crianças e adolescentes atendidos no IML de Maceió, Alagoas, Brasil. Cad Saúde Pública. 2011; 27(8):1647-53.

[13] Núñez, A, Tortolero Y, Verschuur, A, Camacaro, M; Mendoza, S. Violencia sexual: un fenómeno oculto enlaexperticia médico legal. RevObstet Ginecol. Venezuela. 2008; 68(4):233-9.

[14] Bahali K, Akçan R, Tahiroglu AY, Avci A. Child sexual abuse: seven years in practice. J Forensic Sci. 2010; 55(3):633-6.

[15] Jänisch S, Meyer H, Germerott T, Albrecht UV, Schulz Y, Debertin AS. Analysis of clinical forensic examination reports on sexual assault. Int J Legal Med. 2010; 124(3):227-35.

[16] Smith A. The prepubertal hymen. Austfam physician. 2011; 40(11):873-5.

[17] Paiva V, Calazans G, Venturi G, Dias R. Idade e uso de preservativo na iniciação sexual de adolescentes brasileiros. Rev Saúde Pública. 2008; 42(1):45-53

[18] Girardet R, Bolton K, Lahoti S, Mowbray H, Giardino A, Isaac R, *et al.* Collection of forensic evidence from pediatric victims of sexual assault. Pediatrics. 2011; 128(2):233-8.

[19] Jenny C. Emergency evaluation of children when sexual assault is suspected. Pediatrics. 2011; 128(2):374-5.

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ANALYSIS OF ROUGHNESS AND LOSS OF MASS OF COMPOSITE RESIN POSTED A MERGER OF TWO GEL CARBAMIDE PEROXIDE

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ABSTRACT

The aim of this study was to evaluate the surface roughness and mass loss of a microhybrid composite subjected to the action of bleaching agents: carbamide peroxide 10% and 16%. 30 specimens were divided into 3 groups made up: in G1 was not applied product, the G2 was used 10% carbamide peroxide and carbamide peroxide G3 16%, both for 14 days. Data roughness after application were analyzed using "t" test. Was not observed in the microhybrid composite resin, statistically significant differences in roughness. Thus, as the weight of "t" paired two concentrations of carbamide peroxide test were able to induce weight loss. In conclusion, the bleaching agents cause mass loss of the composite resin.

KEYWORDS: Roughness, bleaching agents, carbamide peroxide.

1. INTRODUCTION

In modern dentistry, patients seek more and more, aesthetics in dental offices. The composite has evolved and has been responsible for providing high quality restorations. Another highly sought treatment has been the home bleaching, supervised by a dentist. Among the most commonly used gels for bleaching has been carbamide peroxide on their different concentrations. In much of the treatment plans there is an association of home whitening with subsequent replacement of composite resin restorations.

Tooth bleaching is one of the most accomplished treatments in dental offices to improve the appearance of the smile. This procedure, relatively simple and low cost, is inconvenient the fact that the dentist can not guarantee the patient the desired whitening result. It is therefore important that the professional alert the patient that he is offering a dental whitening procedure, and not exactly a good bleaching result, which can not be guaranteed. For the success of bleaching treatment, it is important to have knowledge of the origin of tooth darkening, ie diagnose the etiology of color change, understand and master the different bleaching products, techniques and their effects on the structure and dental tissues. The procedure consists of applying a bleaching gel based on carbamide peroxide or hydrogen on the teeth to be whitened. Depending on the recommended technique, this procedure can be performed in the office or by the patient, changing the parameters of concentration and time of use[1].

Initially in the industry of dental materials, with the production of composites nanohybrid with an average size of inorganic particles between 100 nanometers to 0.7 microns (1 micron equals 1.000 nanometers). Recently, from 2003 until today, in Brazil, nanoparticulate resins are produced with 100% of nanoscale inorganic particles in the range 20-75 nanometers. We could classify the current composite on the size of inorganic particles: conventional resins or micro particles with an average size comprised load 8 to 15 microns (absent in the market). Resin microparticles from 0.04 to 0.4 micrometers. Hybrid Resins with an average size from 0.04 to 5 micrometers. Composites microhybrids with 0.04 to 0.7 micrometers. Still nanohybrid resins, which are added to microhybrids nanoparticles approximately less than one hundred nanometers to 0.7 microns larger particles; and finally nanoparticulate resins containing nanoparticles 100% all below 100 nm, usually between 20 to 75 nm[2].

The composite resin restorations associated with previous dental whitening, present themselves as more aesthetic restorative treatment option for patients with anomalies of dental form. The use of composites by direct technique in anterior teeth is an alternative able to meet the aesthetic requirements of the patient. His association with the tooth whitening allows the professional

and patient clinical outcome favorable, increasing the value and the brightness of the enamel[3].

Liberato *et al*. (2004)[4], evaluating the surface roughness of the polished resin with a system of wheels and different granulations with silicone tip. Exactly 12 specimens were made. The first group were polished with Sof-Lex discs (dark blue backs, medium blue and light blue, respectively) of 19,5 mm diameter and the second group, with Enhance tips, running up horizontal movements and plans of back-and-comes with the dental pen at low speed, intermittently, for 30 seconds. It was concluded that: the average roughness Charisma resin, polished with silicone tip Enhance is approximately 251 % higher than the average roughness of the polished resin with Sof-Lex sanding discs. Although the roughness index of the tip Enhance silicone has proven high, the results are clinically acceptable.

Marson *et al.* (2005)[5], clinically evaluated the effect of home bleaching. Exactly 40 patients were selected with pre-established criteria, such as having healthy teeth. Patients underwent randomly to the following groups: G1 carbamide peroxide 10 % (2 hours/ day). G2 carbamide peroxide 10 % (8 hours/ day). G3 carbamide peroxide 16 % (8 hours/ day). All were used for 15 consecutive days, wherein sensitivity was checked and cataloged. The gingival irritation level also. Was assessed study 36 % had any side effects, 25 % for sensitivity and 12.5 % of gingival irritation. All groups showed sensitivity, and those who had more were those who stayed longer exposed to the whitening gel.

Pozzobom *et al*. (2005)[6], analyzed the roughness of the in vitro due to restorative materials, bleaching agents and time. We used the glass ionomer cement (GIC) and 3 different types of composite resin. Exactly 120 specimens were made with 2 bleaching agents to be used: 10% carbamide peroxide and hydrogen peroxide 35%. The samples were analyzed for roughness and different groups with different periods of observation of the bleaching agent acting. As a result, there was a significant difference for the factors "materials" and "time." The study showed that the restorative materials generally undergo change when exposed to different bleaching and over time. Surface roughness showed different levels for the material factor.

Soares *et al*. (2008)[7] proposed show the effects of bleaching on oral tissues, restorative materials and care should be taken to the vital teeth. Studies have shown that with the home bleaching with carbamide peroxide, significantly reduced the bond strength of composite resins with the etched enamel. It is advisable to make the resin restoration 7-14 days after the end of bleaching. It was found that the practice of bleaching alter the surface roughness of the VSD and the composite resin.

Marson *et al.* (2008)[8] have investigated the influence of tooth whitening at different concentrations on the bond strength to enamel, and found the influence of time between bleaching and the restoration of the bond strength. Fifty freshly extracted human molars, free of fractures or irregularities, stored in saline were used. The roots of the teeth were removed and sectioned in the coronal part of its long axis. Were randomly divided into five groups. The G1 was the control group, was stored in artificial saliva changed daily. In G2 and G3 groups, the gel carbamide peroxide at 10% for 14 days for 2 hours/ day for bleaching the enamel substrate. The G4 and G5 groups were submitted to seven whitening sessions with 35 % hydrogen peroxide. It was estimated that G2, G3 and G5 showed adhesive strength results similar to the control group (not cleared). The G4 bleached with hydrogen peroxide at 35 % and restored 24 hours later, had its bond strength between enamel and composite resin reduced.

Becker *et al*. (2009)[9], evaluated the effects of bleaching typically used in office on the composite nanoparticle. Were made 28 specimens, which microhardness tests were done before and after whitening, and did not differ significantly between the groups. Also showed no difference when used homemade technique (hydrogen peroxide and 7.5 % carbamide 10 %) and office equipment (hydrogen peroxide and 35 % carbamide 35 %). The Tukey's test showed reduced hardness as compared to untreated body. Bleaching agents did not alter the hardness of the composite nanoparticle compared to the control group.

Azevedo *et al*. (2011)[10] evaluated the microhardness of composite resins, and nanohybrid microhybrids in vitro before and after office tooth whitening. Used Opallis resin and Bright new line, and bleaching products of 35% hydrogen peroxide (HP) of Whiteness HP Max and 37% carbamide peroxide (CP) of Whiteness Super. Were made with 10 groups specimens, all with 3 applications each. G1 to G5 with Opallis resin and G6 to G10 resin Brilliant Newline. Without bleaching G1, G2 and G7 with a pH of 35% and a session, G3 and G8, with 35% and PH 2 sessions, G4 and G9 PC 1 and 37% session, G5 and G10 with 37% PC and 2 sessions, without bleaching G6, G7 with PH of 35% and a session. All specimens were filled with resin according to the group, and respecting the rules of the manufacturers of each whitening gel. In the study was obtained as a result there was no change in hardness values of composite resins in both, regardless of the number of bleaching and applied sessions. Bleaching used did not change the hardness of composite resins.

Daniel *et al.* (2011)[11] investigated possible changes in enamel and roughness of composite resins with different bleaching techniques. Exactly 18 central bovine incisors were used, which were standardized and cavities restored with composite resin. The specimens were randomly divided into: G1 with carbamide peroxide (CP) to

10% for 8 hours daily for 21 days. The groups G2 and G3 with hydrogen peroxide (HP) to 38%, both the brand Opalescence brand and handled in accordance with the manufacturer. G2 by 45mim, 3 15mim each application, 1 week apart, and during the interval were stored in artificial saliva neutral pH. The group G3 was performed in the same manner as G2, only it was subjected to irradiation with LED device. Exactly 3 readings were made roughness of the enamel composite resin and the 6 specimens of each group and microscopic examination done to evaluate the surface morphology. With the absence of bleaching, did not change. Considering the sides bleached and non-bleached of the enamel evaluated, 10 % PC was significant change surface roughness, while the pH to 38% did not change. There were no morphological changes in glazes and not in resins. Observing the groups was analyzed that the type of bleaching influenced only in the roughness of the enamel. The PC application led to changes in morphology and roughness of enamel, and the pH did not alter anything. No restorative procedure changed significantly composite resin.

Pupo *et al.* (2011)[12] evaluated the effect of different bleaching agents on the roughness of resin. Composites were used nanohybrid Bright New Line (BNL) and microhybrid Opallis (FGM). The bleaching agents were chosen hydrogen peroxide (HP) 7.5 % (SS White) and peroxide carbamide (PC) 16 % (Whiteness Perfect FGM). The resins were placed in metal molds and divided into 6 groups. G1 Opallis without bleaching agent. G2 Opallis % at pH 7.5. G3 Opallis with 16% PC, G4 B.N.L. control. G5 BNL PH 7.5%. G6 B.N.L. with 16% PC. After 24 hours stored, the samples were bleached according to the manufacturer's standards. The results revealed that the Opallis resin did not show significant results when the roughness. Already B.N.L. resin change significantly after bleaching. With the study concluded that bleaching agents have the ability to alter the roughness of the resin and the particle size interfere in this regard. The smaller the particle, the greater the chance.

Wang *et al.* (2011)[13] 13 investigated the action of different bleaching agents in the roughness of different composites. Samples of composites of marks were used: Fil-tek Supreme, Filtek Z350, Grandio, Opallis, Filtek Z250. The bleaching agents used were: Whiteness HP Whiteness HP maxx, standard Whiteness. Were used enamel block stored in 0.1 % thymol solution for 30 days. In the groups using HP and HP Maxx as bleaching, each sample was cleared by week 10 i, with the activation was carried out 30 seconds after 5 minutes of whitening. The bodies were for 1 week in deionized water to a repeat bleaching, which was done in a total of 4 weeks. Be done before bleaching and after each week was performed using a surface roughness test. The surface shape was evaluated in triplicate and were used two ways: ANOVA and Bonferroni. The ANOVA showed a significant difference and did not alter the roughness when used Filtek, Opallis, and enamel, compared with the control group. HP Maxx Whiteness was not affected. Grandio had significant change with time. Opallis, Filtek Z250 and Supreme had little change with time. The supreme had to change as significant roughness between 1 ° and 2 ° week. Grandio and Filtek Z350 did not. Z250, enamel and Opallis showed change over time. In conclusion, to the study the changes of the roughness of the composite, after whitening, depends on the material and time, and the enamel was less affected surface.

Pereira *et al.* (2012)[14] evaluated the hardness and surface roughness of a microhybrid composite resin-based silorane, subject to immediate bleaching with hydrogen peroxide containing 35% calcium. A resin was used microhybrid composite, and the bleaching agent used was hydrogen peroxide containing 35% calcium. The specimens were divided into 3 groups: Group 1 composite without bleaching. Group 2 composite subjected to two bleaching sessions immediately with hydrogen peroxide to 35% with calcium. Group 3- composite subjected to two rounds of immediate bleaching with 35% hydrogen peroxide with calcium stored for 7 days in artificial saliva at 37 ° C. As the bleaching agent was applied a layer about 2 mm in thickness on each specimen for 40 minutes. An analysis did not identify significant differences between the groups in terms of roughness ($p = 0.481$), although the control average was higher than the other groups. On the other hand, another analysis of variance showed significant differences between groups in terms of microhardness.

Sossai *et al.* (2012)[15] conducted a systematic literature review on the internal tooth whitening, emphasizing techniques used today, bleaching agents, indications, contraindications, clinical implications, mechanism of action and its effectiveness or rapid and safe promote tooth whitening and more aspects. In review of the literature shows that when the bleaching is carried out using the technique practice, according to the same authors studies have revealed that severe morphological alterations in the enamel surface refers specifically to an increased porosity and roughness that structure, which may be responsible for the decrease in microhardness. Based on the literature, it appears that the isolated or associated use of tooth whitening techniques are subject to risks and side effects.

Zuryati *et al.* (2013)[16] assessed the effects of home bleaching of different types of composite resin. Resins used universal nanoparticulate, resin nanocomposite previous generation and nanohybrid resin. Eighteen samples of each resin were prepared, totaling 54 specimens, subjected to curing for 20 seconds and polishing. The samples were divided into 3 groups containing 6 specimens: G1 represents the control group. G2 was

bleached with Opalescence 10 %. The G3 Opalescence was 20 %. All whitened groups were exposed to bleaching agent according to the standards of the manufacturers. All samples were subjected to surface roughness test using atomic force microscopy after this test, all the samples were subjected to hardness testing using a Vickers. As for the results obtained show that after 14 days exposed to bleaching agent, was not significant compared to the control group. Terms of hardness, there was significant change. The Kelfil resin, whitening after 14 days, an increase of hardness using carbamide peroxide 10 %, and 20 % carbamide peroxide bleaching was decreased, and hardness. The TPH3 resin after bleaching was reduced hardness, both with 10 % and 20 % compared with the control group. It concludes with the research that bleaching agents do not alter the roughness, but the toughness can be altered depending on the material used.

Fanirelle *et al.* (2013)[17] evaluated the direct contact of the whitening gel in composite restorations changes the physical properties of the restorative material. In the literature review shows that the bleaching agent hydrogen peroxide base can affect the surface roughness of composite resin restorations. This increased surface roughness likely occurs, as in the case of changes in the surface hardness of the composite, due to the action of hydrogen peroxide remains the organic matrix of the restorative material. The roughness of the seems to be more affected than the microhardness of the material. Concluded that bleaching agents can induce changes in surface microhardness, surface roughness and color of composite resin restorations present in teeth submitted to bleaching.

Oliveira *et al.* (2013)[18] evaluating the roughness and weight loss of 3 brands of acrylic denture teeth before and after toothbrushing abrasion test. Used 30 specimens divided into 3 groups (G1 Trilux, Artiplus G2, G3 Premium). Initially submitted the samples to surface roughness analysis in roughness (Surf-test 301- Mitutoyo - Sao Paulo, Brazil) and weighed on an analytical balance. Submitted the samples to brushing two years. Concluded that Artiplus teeth were rougher and teeth Premium lost more weight as a result of brushing.

Souza *et al.* (2014)[19] assessed in this study the color stability of a composite subjected to three concentrations of carbamide peroxide. Exactly 40 specimens divided into 4 groups were made. The resin composite specimens were submitted respectively to the exposure of the gel composed of carbamide peroxide 10%, 16% and 22% Whiteness® (FGM, Joinville, SC) for 14 days for two hours. In the control group was not made any application of gel, only evaluated the color of the resin composite specimens before and after application of the gel in the other groups in order to validate the methodology used. The readings for color evaluation were carried out by means of reflectance spectrophotometric technique. Among the different concentrations of carbamide peroxide, which is present at the concentration of 10% was able to clear all the composite test samples (statistically different). Have what is presented in the concentration of 16% cleared 50% of the composite resin specimens (statistically different). The carbamide peroxide that is presented in the concentration of 22 % cleared 50 % of the resin composite specimens, dark 40 % (statistically significant).

The aim of this study was to evaluate the effect of carbamide peroxide gel in concentrations of 10 and 16 % over a microhybrid composite, as the roughness and mass loss.

2. MATERIAL AND METHODS

This was held at the Dentistry Laboratory of the University Severino Sombra, Vassouras, RJ, Brazil.

Specimens

Were made 30 specimens (spc), divided into 3 groups. The samples were mounted in a silicone matrix and were left with the following measures: 5.62 mm in diameter and 2.80 mm thickness (Figures 1, 2 and 3).

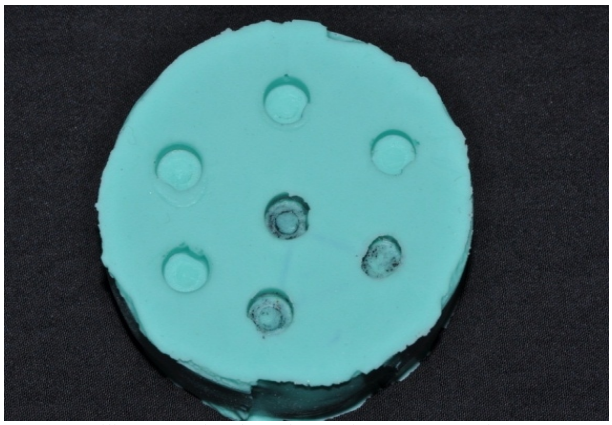

Figure 1. Silicone matrix where the specimens were made.

Figure 2. Diameter of the specimens.

Figure 3. Thickness of the specimens.

For mounting of the specimens was used photopolymerizable resin Opallis® (FGM, Joinville, SC) in A 3,5 color (Figure 4).

Figure 4. Compound used for preparation of specimens.

To polymerize the samples, we used the curing light (LED Coltolux®) for 60 seconds of exposure (Figure 5).

Figura 5. LED used in the polymerization of the composite resin.

We selected two different concentrations of carbamide peroxide contained in Table 1.

Table 1. Distribution of the groups.

G1 Control (10 spc)	----
G1 (10 spc)	CARBAMIDE 10%
G2 (10 spc)	CARBAMIDE 16%

The spc were numbered from 1 to 10 with a ballpoint pen according to the belonging group (Figure 6).

Figure 6. Specimens listed and divided in their respective group.

In order to perform the tests with bleaching gels were used carbamide peroxide 10% and 16% (Whiteness Perfect - FGM, Joinville, Brazil) (Figure 7).

Figure 7. Carbamide peroxide at a concentration of 10% and 16%.

Test implementation of bleaching gels

For the test with bleaching treatments, the samples were placed on a glass plate and applied the bleaching gels on each specimen (2 hours per day, repeating for 14 days), according to the belonging group (Figure 9).

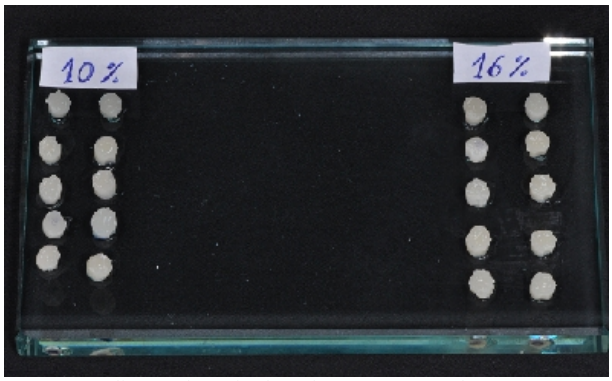

Figura 8. Aplicação dos géis clareadores nos corpos de prova.

The specimens were weighed on a precision scale before and after testing with bleaching gels, accurate to 0.1 mg.

Analysis of surface roughness

Initially, thirty specimens (of microhybrid composite) were analyzed in surface roughness according to ABNT - NBR ISSO4287 with Surftest 301 roughness (Mitutoyo - São Paulo, Brazil) which has a diamond tip with a needle tip radius 5 microns scheduled to go perpendicular to the surfaces of spc (Figure 10). The reading was performed at three different points, to analyze the surface roughness before the application of bleaching gels. For each spc was obtained an average of three readings expressed in Ra (average surface roughness) and were subject to the following standardization reading:

- Type of reading: Ra
- Cut-off: 0,8mm
- Speed reading average: 0,5 mm/s
- Reading mode: sequential
- Action radium: 80µm

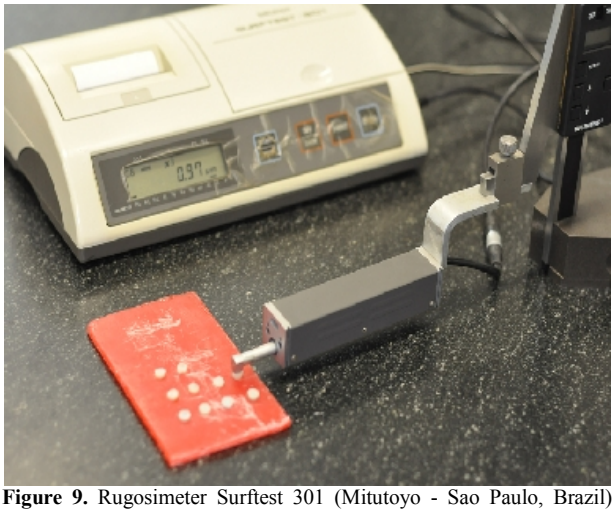

Figure 9. Rugosimeter Surftest 301 (Mitutoyo - Sao Paulo, Brazil) performing the reading of the surface roughness of spc.

The whitening gel was applied once per day for each test specimen and then immediately was removed and subjected to washing and drying.

After 14 days of testing, the samples were weighed in the same analytical balance and then the final roughness was measured.

For analysis of possible changes in the surface roughness of the resin was applied "t" test comparing the means of the control group the mean following the application of carbamide peroxide gel 10 % and 16 %, separately. In the weight variation analysis, paired "t" test comparing the weights before and after application of the gel carbamide peroxide 10 % and 16 % was applied separately. We considered the significance level of 5% ($\alpha = 0.05$) and used Microsoft Excel and GraphPad Software programs.

3. RESULTS

According to the "t" test the differences in roughness between the mean of the control group and 10 % carbamide peroxide were not significant ($p = 0.2093$, $t = 1.342$) and also with the carbamide peroxide 16% ($p = 0.2884$, $t = 1.111$) (Figure 11).

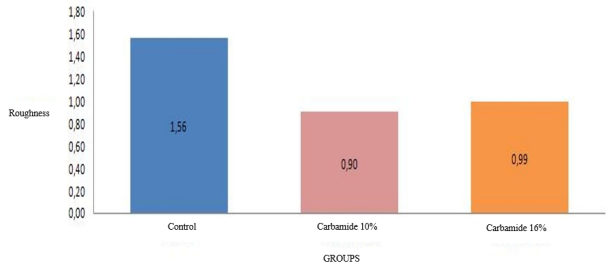

Figure 11. Roughness change.

In terms of weight, the Student "t" test was extremely significant ($p = 0.0002$, $t = 5.893$) between the resin weight before and after application of 10% carbamide peroxide. The same test indicated highly significant differences ($p = 0.0019$, $t = 4.345$) between the resin weight before and after application of 16% carbamide peroxide (Figures 12, 13 and 14).

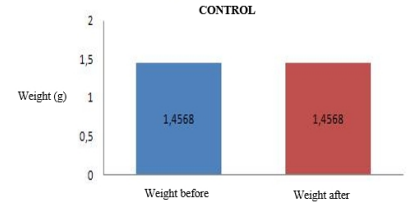

Figure 12. Control - G1

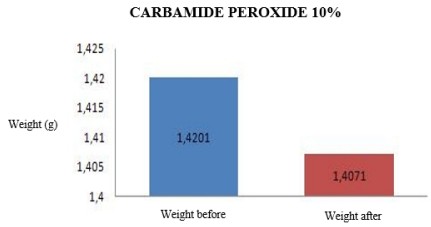

Figure 13. Carbamide peroxide 10% - G2

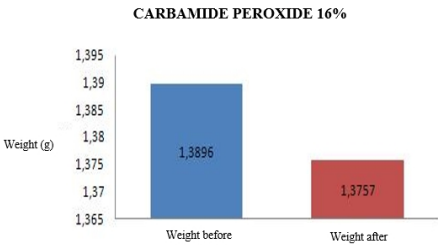

Figure 14. Carbamide peroxide 16% - G3

4. DISCUSSION

The composite resin together with bleaching agents has been constant used in treatment plans implemented in everyday practice. Many studies have been conducted with both materials, but the action of the whitening gel on the composites is not yet fully elucidated so we can have a safe clinical management.

The use of composites by direct technique in anterior teeth is an alternative able to meet the aesthetic requirements of the patient. Much of the existing composite resins on the market are microhybrids and has particles with an average size between 0.04 to 0.7 microns reason why the Opallis resin was chosen for this research[2,3].

Tooth bleaching is largely complete and supervised by the Dental Surgeon. It has advantages such as low cost and is a relatively simple procedure. Dental bleaching enables the professional and patient clinical outcome favorable, increasing the value and the brightness of the enamel. For this work the gel carbamide peroxide at concentrations of 10 and 16% were chosen because they

are easily found in the market[1,3].

Studies show that restorative materials such as composite resin, undergo change when exposed to different bleaching and over time.

In the survey the gel carbamide peroxide in concentrations of 10 % and 16 % were able to change the roughness of composite resin used for the samples. Interestingly the samples were smoother after exposure to bleaching agent. The gel carbamide peroxide 10 % left the resin specimens made smoother than those submitted to gel at a concentration of 16 %[6,7].

The size of the particles in the composite resin, interfere as the clearance of the ability to change its roughness, and that the smaller the particle, the greater the chance. Bleaching agents have the ability to change the surface roughness of the resins. Changes to the roughness of the composite, after whitening, depend on the material and time. The composite resin used was microhybrid and had roughness changes and weight loss after the action of the bleaching agent[12,13].

Bleaching agents can induce changes in surface microhardness, surface roughness and color of composite resin restorations present in teeth submitted to bleaching[17]. Since Pereira *et al*, (2012)[14], did not identify significant differences between the groups regarding the roughness of a microhybrid composite subjected to immediate whitening. Zuryati *et al.* (2013)[16] found that the bleaching agent does not alter the roughness of different types of composite resin, but the hardness can be changed depending on the material used. Disagreeing with these studies, the present study showed changes as the roughness.

Studies such as Oliveira *et al*. (2013)[18], claimed that the mass loss of restorative materials happen by physical agents such as brushing procedure with toothpaste. The microhybrid composite mass loss suffered by a chemical agent, where the gel carbamide peroxide concentrations of 10 % and 16 %. The gel carbamide peroxide at 10 % resulted in more weight loss than the gel carbamide peroxide at 16 %.

Souza *et al*. (2014)[19] in their study showed that the composite subjected to the bleaching gel carbamide peroxide at different concentrations, was able to modify the color composite. Thus, it is seen that the carbamide peroxide gel modifies various properties of the composite health professionals should careful an evaluation to diagnose the replacement of restoration.

More studies should be performed in order to elucidate the reason why the 10% carbamide peroxide gel was able to promote more alterations in microhybrid composite than 16% gel.

5. CONCLUSION

After statistical analysis, we conclude that the carbamide peroxide gel in 10 % and 16 % concentrations is not able to significantly alter the roughness of the composite. However, there was mass loss of resin specimens made in two concentrations, the greatest mass loss change occurred with the gel 10%.

REFERENCES

[1] Francci C, Marson FC, Briso ALF, Gomes MN. Clareamento dental – técnicas e conceitos atuais. Rev Assoc Paul Cir Dent. 2010; 1:78-89.

[2] Bispo LB. Resina composta nanoparticulada: Há superioridade no seu emprego? Rev Dent. 2010; 19.

[3] Aguiar HC, Rodrigues CRT, Goyatá FR, Neto OI, Landa FV. Remodelação Estética em Dentes Anteriores: Relato de Caso Clínico. Clínica- International J of Braz Dent. Florianópolis. 2013; 9(4):396-402.

[4] Liberato FL, Padoan AC, Morgado GL, Coelho LVBF, Kather JM, Almeida ETDC. Avaliação da Rugosidade Superficial de uma Resina Composta Após Polimento Com Discos de Lixa e Pontas Siliconadas. Rev Biociên. Taubaté. 2004; 10(1-2):51-4.

[5] Marson FC, Sensi LG, Araujo FO, Junior SM, Araújo É. Avaliação Clínica do Clareamento Dental Pela Técnica Caseira. R. Dental Press Estét. 2005; 2(4):84-90.

[6] Pozzobon RT, Candido MSM, Rodrigues Júnior AL. Análise da Rugosidade Superficial de Materiais Restauradores Estéticos. Efeito de Agentes Clareadores e Tempo. Rev Odonto Ciência. Fac. Odonto/PUCRS. 2005; 20(49).

[7] Soares FF, Sousa JAC, Maia CC, Fontes CM, Cunha LG, Freitas AP. Clareamento em Dentes Vitais: Uma revisão Literária. Rev Saúde. 2008; 4(1):72-84.

[8] Marson FC, Sensi LG, Arruda T. Efeito do Clareamento Dental Sobre a Resistência Adesiva do Esmalte. RGO, Porto Alegre. 2008; 56(1):33-7.

[9] Becker AB, Costa SXS, Rastelli ANS, Andrade MF, Bagnato VS, Bier CAS Influência dos Agentes Clareadores na Microdureza de Resina Composta Nanoparticulada. RGO. 2009; 57(1):27-31.

[10]Azevedo MR, Gomes GM, Bittencourt BF, Gomes OMM, Gomes JC. Microdureza de Resinas Compostas Submetidas a Clareamento de Consultório. Rev Dentística Online. 2011; 10(21):30-4.

[11]Daniel CP, Soares DGS, Andreeta MRB, Hernandes AC, Hebling J, Costa CAS. Efeito de Diferentes Sistemas de Clareamento Dental Sobre a Rugosidade e Morfologia Superficial do Esmalte e de Uma Resina Composta Restauradora. Rev Odonto Bras Central. 2011; 20(52):7-14.

[12]Pupo YM, Escobar CGN, Hilgenber SP, Verde FV, Gomes OMM, Gomes JC. Efeito de Agentes Clareadores de Uso Caseiro na Rugosidade Superficial de Resinas Compostas: Microhíbrida x Nanohíbrida. Rev Dentística Online. 2011; 10(20):45-9.

[13]Wang L, Francisconi LF, Atta MT, Santos JR, Del Padre NC, Júnior AG, Fernandes KBP. Efeito de Géis Clareadores na Rugosidade Superficial de Resinas Compostas Nanoparticuladas. Eur J Dent. 2011; 5(2):173-9.

[14]Pereira DF, Bevilacqua FM, Boscarioli APT, Felício CM, Secco AS. Avaliação da Microdureza e Rugosidade Superficial de Uma Resina Composta Submetida ao Clareamento Com Peróxido de Hidrogênio a 35%. J Health Sci Inst. 2012; 30(4):323-6.

[15]Sossai N, Verdinelli EC, Bassegio W. Clareamento Dental. Reva Saúde e Pesq. 2011; 4(3):425-36.
[16]Zuryati AG, Qian OQ, Dasmawati M. Effects of Home Bleaching on Surface Hardness and Surface Roughness of na Experimental Nanocomposite. J Conserv Dent. 2013; 16(4):356-61.
[17]Farinelli MV, Paulo PR, Nogueira RD, Martins VRG. Efeitos do Clareamento Dental em Restaurações de Resina Composta. Cient Ciênc Biol Saúde. 2013; 15(2):153-9.
[18]Oliveira AS, Rodrigues CRT, Bruno MV, Castro SHD. Análise da Rugosidade e Resistência à Abrasão de Três Tipos de Dentes Artificiais em Acrílico. 2013; 15(1):55-60.
[19]Souza LCM, Rodrigues CRT, Pereira VFGC, Júnior, N.G.O.; Analysis of Stability of Color Resin Composite Under Three Concentrations Carbamide Peroxide. J of Surg and Clin Dent. 2014; 3(1):05-11.

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CASE REPORT: HEPATIC FUSOCELLULAR SARCOMA

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ABSTRACT

Primary hepatic sarcoma is a rare malignant neoplasm from mesenchymal cells and it is unusual issue in national and international literature. The majority of the cases are asymptomatic or oligosymptomatic. In the imaging tests, there are no specific features for this type of tumor, the main tumor markers do not increase and there is no association with viral hepatitis. The diagnosis performed by histology and immunohistochemistry. Therefore, this article aims to report a clinical/ surgical case of primary hepatic sarcoma. For this, it was performed a retrospective descriptive study along with the general surgery team of a public hospital in Belo Horizonte in 2014. This is a patient with hepatic fusocellular sarcoma, affecting the left lobe of the liver. After multidisciplinary assessment, it was decided for a hepatectomy in three liver´s segments. The patient was discharged with satisfactory clinical/ surgical outcome remained asymptomatic and no signs of disease recurrence after nine months of follow-up. In conclusion, the surgical resection is the mainstay of treatment of primary liver sarcoma and the main determinant of prognosis and tumor recurrence after initial workup.

KEYWORDS: Sarcoma, liver neoplasms, hepatectomy.

1. INTRODUCTION

Sarcomas are rare malignancies source of mesenchymal cells and therefore presents a heterogeneous histological pattern[1,2]. These tumors account for less 1% of all malignant neoplasms of the adult, being more common in children and adolescents whose rate is approximately 10% of the tumors. At aged between children and adolescents, there is evidence of a high rate of mortality and local recurrence and distant metastasis[1,3]. However, primary liver sarcomas represent only 0.1 % to 2 % of liver tumors. Considering all the hepatic sarcomas, most comes from metastasis and only a small portion corresponds to the primary sarcoma of the liver[4]. In adults, 95 % of primary liver tumors correspond to Hepatocellular Carcinoma (HCC) is the fifth most common solid tumor in the world[3].

Most Soft Tissue Sarcomas (STS) arises from the extremities (60 % of cases), most commonly the lower. However, they may also develop in the thorax (30 % of cases) and in the head, neck and other sites (10 %)[2].

Surgical resection R0 with minimum margin of one centimeter corresponds to the treatment of choice, the only method that can be cured. The prognosis is related to histological type, degree of differentiation and tumor involvement[4].

The aim of this study was to report the case of a patient with spindle cell sarcoma and liver conducting a review of the literature on this topic so scarce in scientific circles.

2. CASE REPORT

G.V.P., female, 70 years old, Ethnicity Caucasian, sought medical care from general surgery in January 2014, complaining of chronic diarrhea. The consultation, had an abdominal ultrasound performed on 10/18/2013, which showed increased volume of liver due to a massive oval solid mass, heterogeneous, vascularized, located in the transition of IVb and V segments with exophytic component, projecting inferiorly, measuring about 14.8 X 13.4 X 8.4 cm, shown in Figure 1.

The patient also presented a computed tomography of the abdomen (11/13/2013), which showed increased liver size in the left lobe, with homogeneous parenchyma. It was observed a large expansive lesion, well outlined, lobulated contour, hypodense with heterogeneous enhancement, after contrast medium and trend homogenization in the later stages. The lesion, located in segments II and IVb, has measured about 14.3 X 14.5 X 8.5

cm and extending the hepatic limits with lower compression and displacement of the transverse colon, reaching out to touch the greater gastric curvature according to Figure 2.

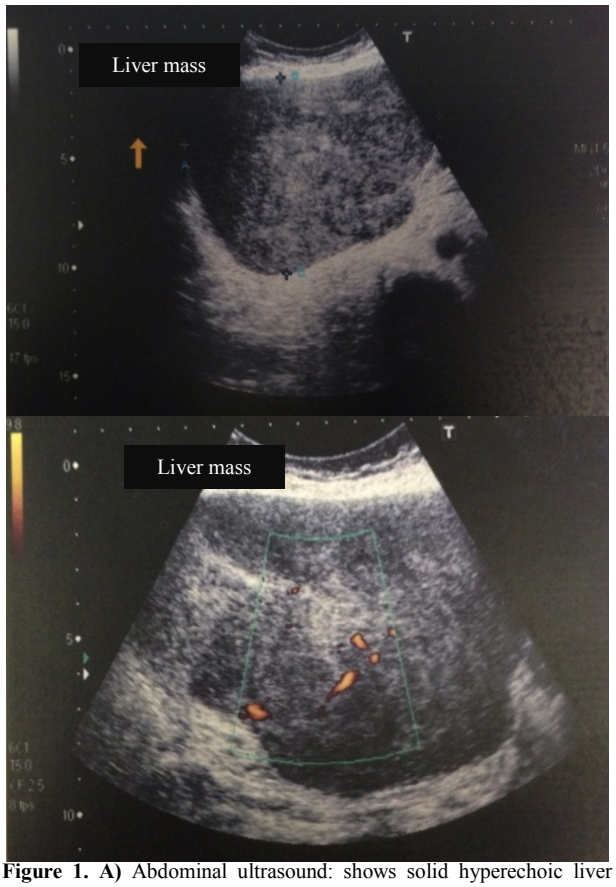

Figure 1. A) Abdominal ultrasound: shows solid hyperechoic liver tumor. **B)** Abdominal ultrasound: vascularized nodule on Doppler.

Figura 2. Abdominal tomography: presence of hepatic mass contoured little enclosed in right lobe with heterogeneous enhancement of intravenous contrast.

Furthermore, had the following tumor markers 11/27/2013: CA19.9 IU/ mL 11.1; carcinoembryonic antigen (CEA) of 0.68 ng/ mL and alpha-fetoprotein 3.2 ng/ mL. A hypothetical diagnosis of hepatocellular carcinoma (HCC), which was indicated trisegmentectomy, which was held on 01/10/2014.

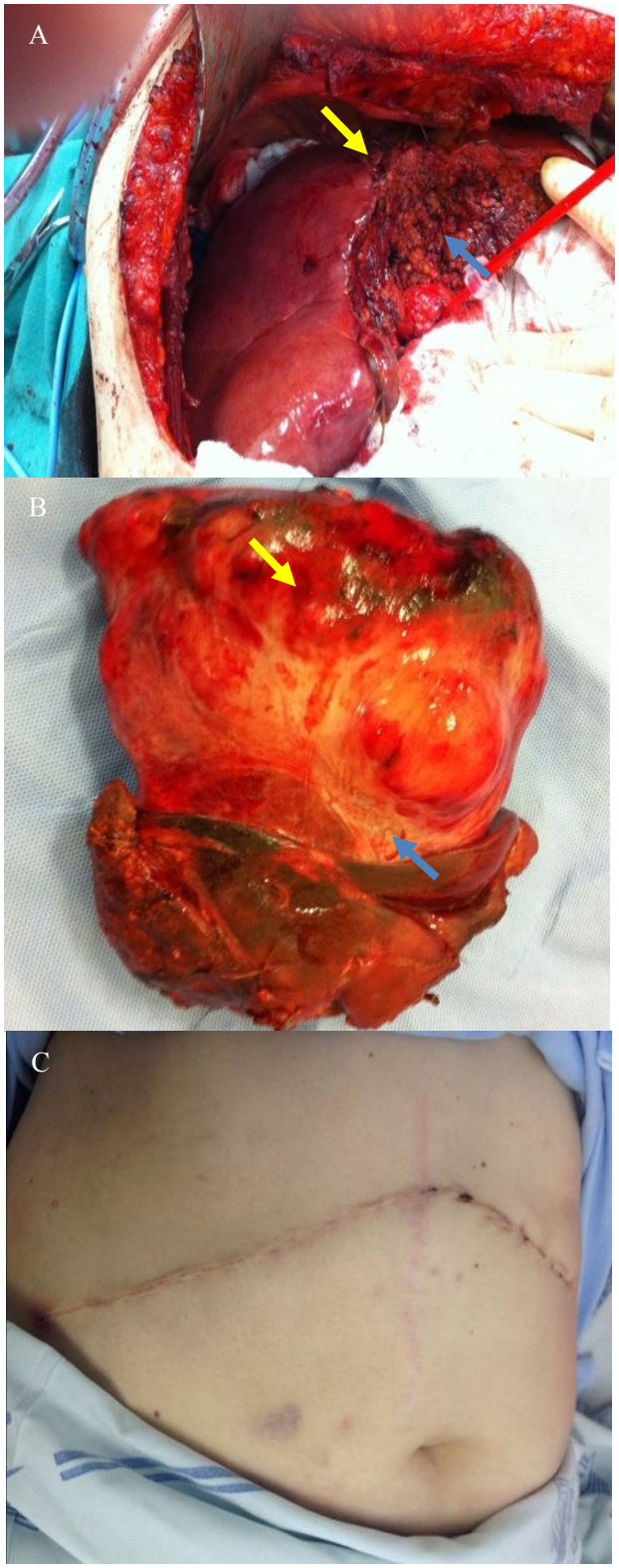

Figure 3. A) trisegmentectomy: Yellow arrow: liver resection bed; blue arrow: Pringle maneuver; **B)** anatomical resection part: yellow arrow: tumor; blue arrow: liver bed; **C)** surgical incision scar.

The surgery was uneventful and the patient was transferred to the intensive care unit for postoperative care. The material was sent to the pathological examination showed that constituted neoplasia fusocellular cells with moderate atypia and few mitoses. The cytology of ascetic fluid was negative for atypical cells and immunohistochemistry demonstrated expression to just smooth muscle actin-positive in rare cells for cytokeratin, no necrosis and presence of three five mitotic figures per high-power field, which favored the diagnosis of spindle cell sarcoma of low grade indefinite histogenesis. The patient remained stable and was discharged on the 5th postoperative day (POD) to the infirmary, evolving with deep vein thrombosis (DVT) and pulmonary embolism (PE) in 9 POD (Figure 4). She was treated for this complication and the patient was discharged on postoperative day 21st for outpatient follow.

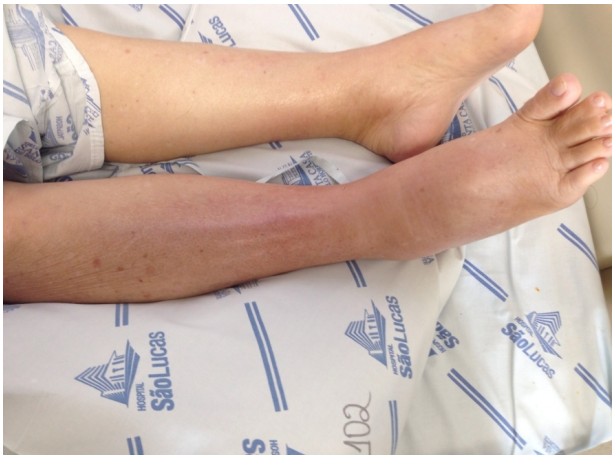

Figure 4. Patient with edema and hyperemia of the right leg.

3. DISCUSSION

Soft Tissue Sarcomas (STS) are rare malignancies originating from mesenchymal tissues resulting from neoplastic transformation of structures derived from the mesoderm and neuroectoderm[1].

The World Health Organization (WHO) defines more than 50 STS subtypes besides the bones, being fundamental the correct classification of these neoplasms, since they have different biological behaviors and differences in the response to therapeutic modalities[1]. However, there is a difficulty in making a correct diagnosis of mesenchymal tumors in the absence of immunohistochemical markers specific to each histological subgroup. The same material sent to pathologists can generate a diagnostic disparity around 25%[1].

Some of the most common histological types of STS are: angiosarcoma, embryonal sarcoma, leiomyosarcoma, epithelioid hemangioendothelioma, fibrosarcoma, rhabdomyosarcoma, and malignant fibrous histiossarcoma[5]. In this study, the histological subtype was compatible with hepatic leiomyosarcoma.

As in the report described case, the primary hepatic sarcoma is more common in females (2:1) and after the fifth decade of life. In addition, most patients are asymptomatic at diagnosis, which is usually random and routine tests such as abdominal ultrasonography[6]. When symptoms occur, are nonspecific as abdominal discomfort or pain, weight loss, or chills[7,8,9,10].

As opposed to the STS, which are associated with alcoholism, cirrhosis and chronic hepatitis, hepatic sarcomas etiology and risk factors remain unclear in most patients[11,12]. In agreement with the literature, the patient had tumor markers (carcinoembryonic antigen- CEA, alpha-fetoprotein and Ca19.9) negative both preoperatively and postoperatively, which contradict with the main differential diagnosis of primary liver tumor is STS (70% alpha-fetoprotein high diagnosis)[3].

The vast majority of patients with primary hepatic sarcoma presents negative serology for viral hepatitis, as well as in the case report. In imaging studies, no specific features for this type of cancer, however, the most common presentation is the solitary intrahepatic tumor with a diameter of major axis greater than 5 cm, which agrees with the present study[4]. Despite advances in of imaging methods, the histopathology and immunohistochemistry are still the gold standard for diagnosing the disease. The use of percutaneous biopsy is still debatable because a negative sample does not exclude malignancy and there is still risk of injury of vessels and severe biliary tract and tumor dissemination. Owing to this consideration, currently, it is recommended to tumor resection guided by intraoperative ultrasound, and, in cases of resection of contraindication, biopsy should be performed by laparoscopy or conventional surgery[4].

Response to the rarity of primary hepatic sarcoma and the low number of reports in the literature, currently there is no standard therapy. However, studies indicate that the main form of treatment is surgical resection with minimum margin of tumor involvement of free 1cm (R0) and similar to other hepatic malignancies. Currently, the morbidity and mortality of liver resection has been decreasing due to the emergence of new surgical techniques and a broader understanding of the perioperative management. There are few cases of treatment for the tumor enucleation (R1), but with high local recurrence rate. Liver transplantation, used to treat other liver tumors, is still uncertain as treatment in primary hepatic sarcoma with high rates of metastasis. The patient whose case was reported here, for having made a resectable tumor, normal liver function and good surgical status, was chosen to carry out the hepatectomy trisegmentectomy type R0[7,8,9,10].

Still has no standard treatment with chemotherapy and/ or radiotherapy neoadjuvant and/ or adjuvant. Some studies suggest treatment with adjuvant chemotherapy

for poorly differentiated tumors, metastases and tumor recurrence with use of doxorribicin, ciclosfamide of etoposide phosphate and orifosfamide because it seems slow the course of the disease. With regard to radiotherapy, primary hepatic sarcomas seem to be radioresistant[13]. Regarding the described case, the patient was referred to radiotherapy service and clinical oncology and due to the histological results of resection with clear margins and it is a low-grade tumor; it was decided to clinical follow-up, not requiring treatment adjuvant.

The local recurrence, distant metastasis and survival are related to the histological type, degree of differentiation and the presence of surgical excision margin involvement. Most metastases occurs in the first two post-surgical resection years and represents the major site the lung. The median survival for patients who underwent R0 resection was 77% at 5 years. Moreover, patients undergoing resection R1 have mortality rates of around 100% at 3 years[14,15,16]. The patient in question is the 9th month of monitoring and asymptomatic without evidence of tumor recurrence.

4. CONCLUSION

The fusocellular sarcoma liver is an uncommon subtype with few cases described in the literature. The experiences of isolated cases in different centers is important to improve surgical techniques, evaluate the benefits of neoadjuvant therapy and/ or adjuvant chemotherapy and/ or radiotherapy and propose more effective treatment regimens. Surgical resection R0 is the mainstay of treatment, the main determinant of tumor recurrence and prognosis.

REFERENCES

[1] Dini Camargo VP. Biologia molecular dos tumores mesenquimais. In: Gehm-hoff PM, et al. Tratado de oncologia. 1ª ed. São Paulo: Atheneu. 2013.

[2] Coley A, Trent JC. Sarcoma de partes moles. In: Gehm-hoff PM, et al. Tratado de oncologia. 1ª ed. São Paulo: Atheneu. 2013.

[3] Thomas MB. Tumores do fígado. In: Gehm-hoff PM, et al. Tratado de oncologia. 1ª ed. São Paulo: Atheneu. 2013.

[4] Matthaei H, Krieg A, Schmelzle M, Boelke E, Poremba C, Rogiers X, et al. Long-term survival after surgery for primary hepatic sarcoma in adults. Arch Surg. 2009 Apr; 144(4):339-44.

[5] Lu J, Zhang J, Xiong XZ, Li FY, Ye H, Cheng Y, et al. Primary hepatic sarcomatoid carcinoma: clinical features and prognosis of 28 resected cases. J Cancer Res Clin Oncol. 2014 Jun; 140(6):1027-35.

[6] Drinković I, Brkljacić B. Two cases of lethal complications following ultrasound-guided percutaneous fine-needle biopsy of the liver. Cardiovasc Intervent Radiol. 1996 Sep-Oct; 19(5):360-3.

[7] Zornig C, Kremer B, Henne-Bruns D, Weh HJ, Schröder S, Brölsch CE. Primary sarcoma of the liver in the adult. Report of five surgically treated patients. Hepatogastroenterology. 1992 Aug; 39(4):319-21.

[8] Peiper M, Rogiers X, Zornig C. [Primary sarcoma of the liver in adults]. Langenbecks Arch Chir. 1994; 379(6):368-71.

[9] Forbes A, Portmann B, Johnson P, Williams R. Hepatic sarcomas in adults: a review of 25 cases. Gut. 1987 Jun; 28(6):668-74.

[10] Poggio JL, Nagorney DM, Nascimento AG, Rowland C, Kay P, Young RM, et al. Surgical treatment of adult primary hepatic sarcoma. Br J Surg. 2000 Nov; 87(11):1500-5.

[11] Andreu V, Elizalde I, Mallafré C, Caballería J, Salmerón JM, Sans M, et al. Plexiform neurofibromatosis and angiosarcoma of the liver in von Recklinghausen disease. Am J Gastroenterol. 1997 Jul; 92(7):1229-30.

[12] Sussman EB, Nydick I, Gray GF. Hemangioendothelial sarcoma of the liver and hemochromatosis. Arch Pathol. 1974 Jan; 97(1):39-42.

[13] Dannaher CL, Tamburro CH, Yam LT. Chemotherapy of vinyl chloride-associated hepatic angiosarcoma. Cancer. 1981 Feb 1; 47(3):466-9.

[14] Alrenga DP. Primary angiosarcoma of the liver. Review article. Int Surg. 1975 Apr; 60(4):198-203.

[15] Weitz J, Klimstra DS, Cymes K, Jarnagin WR, D'Angelica M, La Quaglia MP, et al. Management of primary liver sarcomas. Cancer. 2007 Apr 1; 109(7):1391-6.

[16] Locker GY, Doroshow JH, Zwelling LA, Chabner BA. The clinical features of hepatic angiosarcoma: a report of four cases and a review of the English literature. Medicine (Baltimore). 1979 Jan; 58(1):48-64.

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AN ALTERNATIVE MANEUVER TO TREAT GINGIVAL RECESSION

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ABSTRACT

This article reports a clinical case in which was applied autologous bone graft associated with subepithelial connective tissue graft, harvested by gingivectomy procedure with technical modifications to increase gingival graft extension, also to be used as guided tissue regeneration, to treat a single gingival recession. After 1 year and 2 months of follow-up, the coverage of the recession was 4.0 mm, which corresponded to the gain of attached keratinized gingival tissue. An increase in the gingival tissue thickness was observed, without significant probing depth. The procedures applied to treat this case may be biologically and clinically useful to treat gingival recession.

KEYWORDS: Case report, connective tissue, esthetics, gingival recession.

1. INTRODUCTION

Gingival recession is defined as apical migration of junctional epithelium, loss of attachment, resorption of alveolar bone, with root surfaces exposure without formation of periodontal pocket. It is prevalent in patients with poor or good plaque control, with or without gingival margins inflammation being always part of periodontal disease process[1]. Its etiology is a complex interaction of bacteria and predisposing risk factors, as: anatomical features, iatrogenic process, emotional conditions, behaviors (habits), traumatic occlusion, mechanical trauma, chemical trauma, tobacco consumption and has been found frequently on buccal surfaces than on other aspects of the teeth[1,2,3].

Gingival recession in its localized or generalized form, often result in non-esthetic condition and exposed root surfaces are prone to abrasion, caries and hypersensitivity[1]. The management of gingival recession, a consequence of periodontal disease progression is based on a thorough assessment of the etiological factors and degree of periodontal tissue involvement[1,4]. Once the etiology of the condition has been uncovered and addressed, the treatment plan to arrest or reverse the gingival recession may be established[4,5].

The treatment plan will be based on the severity of symptoms as dentinary hipersensibility, the future consequence of the lesion as radicular caries and the goal of the patient as esthetic concerns[5]. In this case, the regenerative periodontal procedures as subepithelial connective tissue graft employed as guided tissue regeneration and autogenous bone graft were applied, attempting to gain new clinical attachment, keratinized gingiva, improve bone level, and minimize postoperative gingival recession.

2. CASE REPORT

A 22-year-old female patient was referred to the Periodontology Clinic, São Paulo State University-UNESP, in January 2013, for evaluation and treatment of single recession in the lower left central incisor. Her complaints were esthetics and dental sensitivity. She was non-smoking, presented good systemic health, did not take any medication in the previous 3 months, had no known allergies and brushed his teeth with a soft-bristle toothbrush using horizontal motions.

Figure 1. Gingival recession.

The clinical examination revealed a plaque index of 39%,[6] a gingival index of 18%,[6] and probing depth almost in all teeth ≤ 2 mm however, by lingual side in posterior teeth in the maxilla, the marginal and papillary gingiva appeared enlarged and prominent with probing deep around 4mm, but without attachment loss. Approximately 3 mm of excessive gingival tissue was observed in relation to the cementum-enamel junction. Radiographic evaluation showed no bony defect. Only lower left central incisor displayed evident gingival inflammation with 4 mm of clinical attachment loss (Figure 1).

The lesion was caused by anatomic features (lower left central incisor buccally malpositioned in the arch), associated with traumatic occlusion (Figure 2) [1,2,3]. The traumatic occlusion was treated by adjusting centric position and anterior guidance, to distribute anterior teeth contacts on protrusion movement (Figure 3) [7]. As the marginal tissue recession of lower left central incisor extended to the mucogingival junction and a clear attachment loss and tooth malposition existed, classification of the gingival recession was consistent with class II according to Miller[8]. The patient was given a detailed explanation concerning the procedure, and informed consent was obtained from her. The patient underwent complete root scaling with sonic scaler and oral hygiene instructions[10]. After 1 month, the plaque index was 22%,[6] and the gingival index was 8%; thus, a subepithelial connective tissue graft in association with autologous bone graft was proposed, aiming for root coverage of lower left central incisor[9,10].

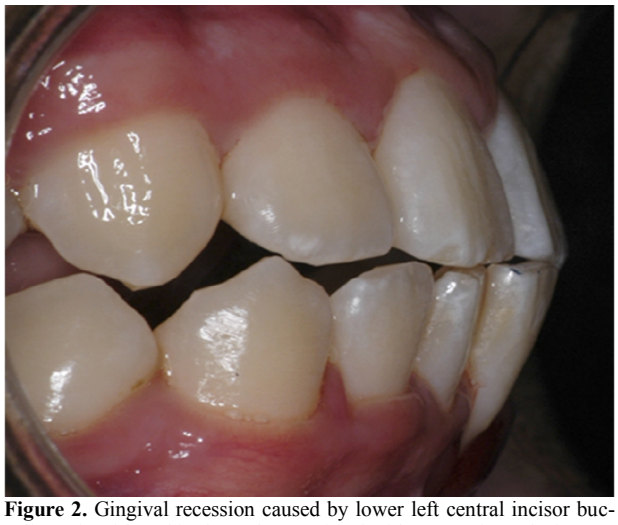

Figure 2. Gingival recession caused by lower left central incisor buccally malpositioned in the arch, associated with traumatic occlusion.

Initially, intra and extra oral antisepsis was carried out using 0.12% chlorhexidine digluconate. Following local anesthesia, the exposed root surfaces were submitted to physical treatment by root scaling with sonic scaler. Then, a sulcular incision was made through the buccal aspect with a 15C scalpel blade, preserving the integrity of the papillae.

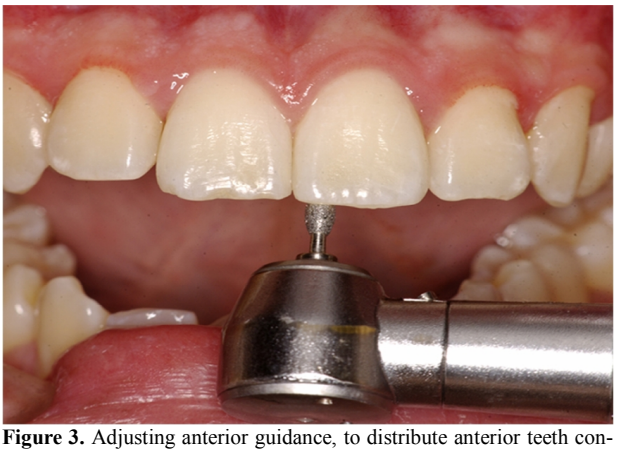

Figure 3. Adjusting anterior guidance, to distribute anterior teeth contacts on protrusion movement.

The incision was initiated in the distal aspect of the lower right lateral incisor and extended to the distal aspect of the lower left central incisor. A vertical incision was performed in the distal aspect of both teeth. The flap was elevated by carefully full-thickness dissection performed with a periosteal elevator. The exposed periodontitis-affected root surface was altered chemistrilly with topical application of tetracycline hydrochloride paste for 4 minutes. To the purposes of demineralization and decontamination, to make it a hospitable substrate to support and encourage migration, proliferation, proper phenotypic expression of periodontal connective tissue progenitor cells and attachment[11,12]. To influence faster bone graft union and incorporation, the bone surrounding root of lower left central incisor was decorticated, to expose bone marrow and endosteum (Figure 4) [13].

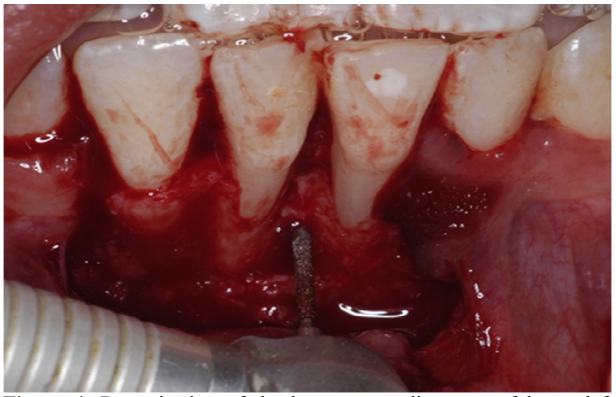

Figure 4. Decortication of the bone-surrounding root of lower left central incisor to expose bone marrow and endosteum.

To harvest a subepithelial connective tissue graft, the area elected was the palatal mucosa that could produce a graft large enough to completely cover the receptor area. On clinical examination, marginal and papillary gingiva by lingual side in the posterior teeth of the maxilla appeared thus far enlarged and prominent, in spite of initial periodontal therapy. Further palatal gingival margin as-

sessment revealed a fibrous and consistent tissue, without bleeding on probing depth. A gingivectomy procedure with technical modifications was planned, to correct gingival contour and improve aesthetics crown lengthening by reducing the amount of gingiva. First, an intra sulcular incision was made through the lingual aspect with a 15C scalpel blade until achieving the bone crest. This incision was initiated in the distal aspect of the upper left first premolar and extended longitudinally to the distal aspect of the upper left first molar, until exposing maxillary tuberosity. A vertical incision was performed in the distal aspect of upper left first premolar. The flap was deflected by carefully full-thickness dissection performed with a periosteal elevator. A straight horizontal releasing incision technique was executed on the level and in the direction of cementoenamel junction, from the distal aspect of upper left second molar until distal aspect of upper left first premolar, to remove excess of gingival tissue which was used as the tissue to be grafted (Fig. 5). After that, the epithelial tissue was removed from the graft by acute dissection to obtain only connective tissue. A scheme was performed to enlarge the extension of the graft to cover completely avascular root surface, with its major extension over adjacent vascularized tissues. For that reason, the connective tissue graft harvested with the maximum thickness was positioned on a sterilized glass plate and immobilized with a sterile spatula. The graft was split cross-sectionally with a 15C scalpel blade; however, it was not divided completely into two parts. After this procedure, the graft had almost twice the length of the initial graft and a thickness around 1.5 mm (Fig. 6). The autologous bone graft was harvested from maxillary tuberosity by using a roungeur (Fig. 7).[12]

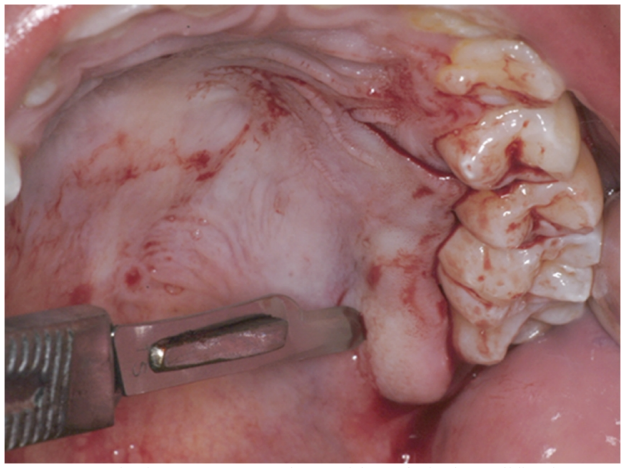

Figure 5. Gingivectomy procedure with technical modifications to harvest connective tissue to be grafted.

The palatal flap was then incised by internal bevel incision and the excess of connective tissue was dissected and the flap was thinned. The excess of connective tissue was not removed; it was dislocated and repositioned coronally, over the crest of alveolar bone. The flap was sutured to hold tissues passively in the position with suspensory 4.0 silk sutures (nonabsorbable organic material: silk black braided, #4-0, cutting needle, P-3, Ethicon, São José dos Campos, SP, Brazil) (Figure 8).

Figure 6. Connective tissue graft harvested by gingivectomy.

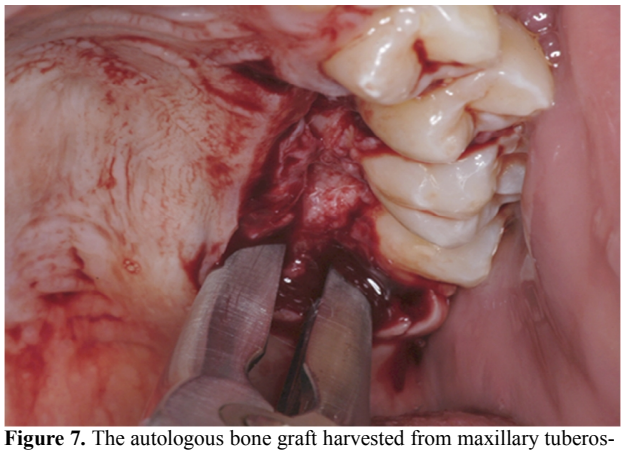

Figure 7. The autologous bone graft harvested from maxillary tuberosity by using a roungeur.

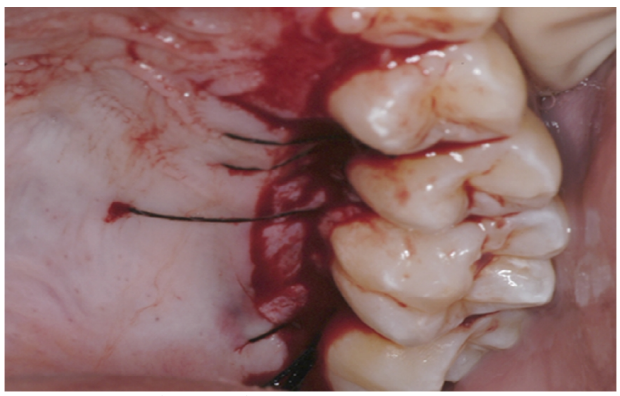

Figure 8. Donor site sutured.

The bone graft is positioned and trimmed on the receptor site and the subepithelial graft was placed and sutured over the grafted bone with suspensory sutures (nonabsorbable synthetic material: nylon black braided, #5-0 cutting needle, P3, Ethicon, São José dos Campos, SP, Brazil). The flap was then sutured to achieve primary closure over the grafted site (Figure 9, 10, 11). A periodontal dressing (Coe Pack GC) was applied over the donor site and on the receptor area.

Figure 9. The bone graft positioned and trimmed on the receptor site.

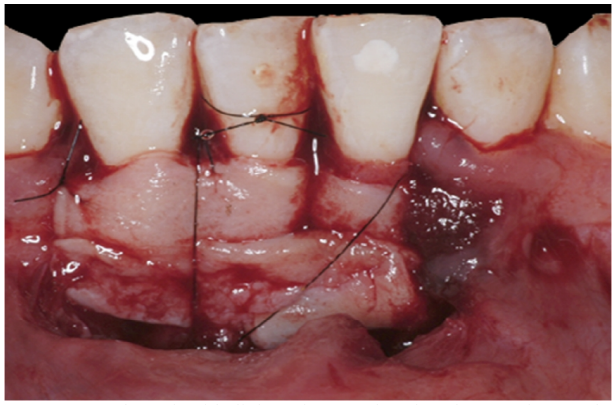

Figure 10. The subepithelial graft was placed and sutured over the grafted bone with suspensory sutures.

Figure 11. The flap sutured over the grafted site.

The patient was instructed to take analgesic medication (acetaminophen, 750 mg, three times a day for 4 days) and to use mouthrinse with 0,12% chlorhexidine digluconate twice daily for 21 days. The periodontal dressing and all sutures were removed after 10 days (Fig. 12). The patient was followed up weekly and monthly up to the third month.

The healing process was uneventful, and the patient did not report pain or discomfort during the overall postoperative period. During the postoperative follow-up, no sign of necrosis or hemorrhage was observed in the donor and receptor areas.

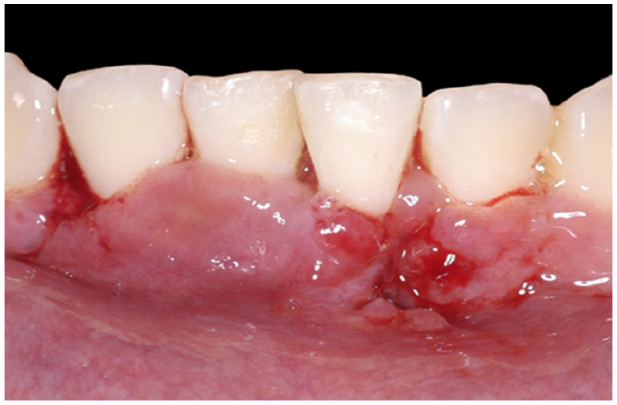

Figure 12. Postoperative after 10 days.

Figure 13. 1 year and 2 months of follow-up.

Figure 14. Donor site 1 year and 2 months of follow-up.

The color of the tissues was nearly homogeneous 3 weeks following the surgical procedure and esthetic improvements were observed 3 months postoperatively and were maintained during 1 year and 2 months of follow-up (Figure 13).

The coverage of the recession was 4.0 mm; this value corresponded to the gain of keratinized tissue. In addition, an increase in the tissue thickness was observed, without significant probing depth. The donor site also was uneventful with marginal gingiva positioned at cementoenamel junction with health aspect (Figure 14).

3. DISCUSSION

The etiology of gingival recession is considered multifactorial, where bacteria are essential, but always needs to be associated with predisposing risk factors to develop the disease[1,2,3,4]. The predisposing risk factor may be an inherent characteristic associated with an increased rate of a subsequently occurring disease, but does not necessarily cause the disease[4]. The gingival recession may cause esthetic concern, dental root sensitivity and radicular caries predisposition[1]. To treat gingival recession, always will be necessary to eliminate or to establish a control in all etiologic factors or improve host local defense against the entire etiologic factors, to promote homeostasis in diseased areas through a long stated period[4]. In this case the etiological factors playing determinant role in the gingival recession development were: bacteria, traumatic occlusion and the tooth buccally malpositionated; an anatomical feature[1,2,3]. To establish bacterial plaque control, the patient underwent complete root scaling and the oral hygiene instructions.

The traumatic occlusion was promoted due buccally malpositioned lower left central incisor. When the mandible was moved into protrusion, the lower left central incisor was aimed anteriorly and first come to contact with the maxillary upper incisor, promoting deleterious contact in mandibular eccentric movement[7]. Posterior centric contact was checked out and an occlusal adjustment was carried out, because premature contact in centric position may move the mandibular arch anteriorly, promoting undesirable anterior contact[7]. In the sequence, the lingual face of upper incisor was adjusted to distribute anterior teeth contacts on protrusion movement.[7] Malposition of lower left central incisor also may induce alterations in the widths of the keratinized and attached gingiva and a thin bony in buccal aspect, decreasing amount of bone marrow, thus, predisposing bone reabsorption and gingival recession[1,2,3]. When all etiologic factors may not be eliminated or controlled, the alternative procedure should be to improve host defense against aggressor agents to establish disease contro[4].

In order to improve local resistance in lower left central incisor, an autogenous bone graft associated with guided tissue regeneration was considered[9,10]. The autogenous bone graft from the maxillary tuberosity is the most viable periodontal bone graft, due presence of hematopoietic tissue and their osteogenic potentials to form the new bone, by processes of osteogenesis, osteoinduction, and osteoconduction[10]. Therefore, the bone graft harvested from maxillary tuberosity was positioned and trimmed on exposed root surface and adjacent decorticated vascularized tissues. A subepithelial graft was used as barrier membranes to direct the growth of new bone, to augment keratinized attached gingival tissue and to recover the root of lower left central incisor[9]. An adequate blood supply from the tissues adjacent to the graft bed seems to be the single most important factor for the survival of grafted tissue[5,9,12,13]. Then, a large extension of the graft to cover completely avascular root surface, with its major extension over adjacent vascularized tissues seem to be important. The method applied to harvest a large connective tissue graft in this case was significant to aid an initial stability of the subepithelial graft on vascularized portion of receptor site, which was decorticated, allowing the revascularization and maintenance of the amount of connective tissue graft during healing process. The subepithelial graft was placed and sutured over the grafted bone, attempting to exclude gingival epithelium interference, guiding only required tissue regeneration, to recuperate diseased root surface by establishing new resistant tissue development as bone, and keratinized attached gingiva[2,3,4,9]. The space created by bone graft may allow easily cells from the periodontal ligament and bone marrow exposed by decortication, to expand blood supply and to populate with mesenchymal stem cells penetration into the bone graft in its early reparative phase[9,10,13]. The release of local growth factors, which would be caused by receptor bed decortication, also has been suggested as one of the factors explaining the hastening of bone graft incorporation process[12,13]. These procedures could induce new bone formation and new connective tissue attachment to the avascularized root surface, preventing epithelial migration and the establishment of the long junctional epithelium until the base of the original periodontal defect[4,12,14]. The gain of keratinized attached gingival tissue and possible bone neoformation, may induce supplementary resistance against the gingival recession recidivism[4]. Then, the goal of treatment was not only to eliminate or to control etiologic factors; application of procedures which could recuperate some lost tissues improving its quality and quantity, may also increase host resistance against aggressor agents, helping to achieve homeostasis in altered area[4]. Another aspect regarding to the biologic mechanism that facilitates healing of lost periodontium by using guided tissue regeneration is attributed to stabilization of the root-clot-graft interface by membrane[12]. In surgical periodontal therapy when periodontal wounds are closed and sutured, one of the wound margins is an avascular and rigid periodontitis-affected and altered root surface and another wound margin is a soft tissue vascular flap margin[12,15]. This detail induces a fibrin clot formation with a fragile initial attachment to the altered root surface, for preventing epithelial down growth and to form a scaffold for development of a cell and collagen fiber attachment mechanism[12,15]. Then, a fibrin clot adherent to the altered root surface is a fragile but vital part of early periodontal wound healing. If this first series of events is disrupted, or if the initial attachment of fibrin or/and immature connective tissue is ruptured, then a pattern of healing including a long junctional epithelium to the base

of the original periodontal defect is expected to occur to prevent infection[12,14,15].

Then, the suture also may be considered as an important factor during regenerative attempts, stabilizing and protecting the root-clot-graft interface in earlier period of wound healing.[12] For this reason, the flap margin was sutured positioned coronally to the cemento-enamel junction, in a manner that could be well stabilized against the tooth, limiting the possibilities of gingival margin movement[12]. The patient is maintained over periodic plaque control supervision, to keep the area clinically health.

4. CONCLUSION

The present clinical results, after 1 year and 2 months of periodic control, show an adequate mucogingival complex in which the mucogingival tissues can sustain their biomorphological integrity and maintain an enduring attachment to the tooth and the underlying alveolar bone, allowing to conclude that the procedures applied to treat this case may be biologically and clinically useful to treat gingival recession.

REFERENCES

[1] Kassab MM, Cohen RE. The etiology and prevalence of gingival recession. J Am Dent Assoc. 2003; 134:220-5.
[2] Ericsson I, Lindhe J. Recession in sites with inadequate width of the keratinized gingiva. An experimental study in the dog. J Clin Periodontol. 1984; 11:95-103.
[3] Kennedy JE, Bird WC, Palcanis KG, Dorfman HS. A longitudinal evaluation of varying widths of attached gingiva. J Clin Periodontol. 1985; 12:667-75.
[4] Kina JR, Suzuki TYU, Kina J, Kina M, Kina EFU. Reparative phase events on periodontal disease progression: interpretation and considerations. Int J Microbiol Res. 2013; 5:439-44.
[5] Oates TW, Robinson M, Gunsolley JC. Surgical Therapies for the Treatment of Gingival Recession. A Systematic Review. Ann Periodontol. 2003; 8:303-20.
[6] Ainamo J, Bay I. Problems and proposal for recording gingivitis and plaque. Int Dent J 1975; 25:229-35.
[7] Dawson PE. Evaluation, Diagnosis, and Treatment of Occlusal Problems. 2nd ed. St. Louis, Mosby. 1989.
[8] Miller PD Jr. A classification of marginal tissue recession. Int J Periodontics Restorative Dent. 1985; 5:8-13.
[9] Langer B, Langer L. Subephitelial connective tissue graft technique for root coverage. J Periodontol. 1985; 56:715-20.
[10] Brunsvold MA, Mellonig JT. Bone grafts and periodontal regeneration. Periodontal. 2000; 1993; 1:80-91.
[11] Lowenguth RA, Blieden TM. Periodontal regeneration: root surface demineration. Periodontol. 2000; 1993; 1:54-58.
[12] Polson AM. Periodontal regeneration: current status and directions. Chicago:Quintessence Books.1994.
[13] Greenstein G, Greenstein B, Cavallaro J, Tarnow D. The role of bone decortications in enhance the results of guided bone regeneration: a literature review. J Periodontol. 2009; 80:175-89.
[14] Bossahardt DD, Lang NP. The junctional epithelium: from heath to disease. J Dent Res. 2005; 84:9-20.
[15] Polimeni G, Xiropaidis AV, Wikesjö UME. Biology and principles of periodontal wound healing/regeneration. Periodontol 2000. 2006; 41:30-47.

REACTIVE CHONDROMATOUS METAPLASIA CAUSED BY DENTAL PROSTHESIS IN ANTERIOR MAXILLA

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ABSTRACT

Osseous and chondromatous metaplasia in maxillary bones is extremely rare, therefore this study is an important case report of the female patient, 48 years old, Caucasian, user of prosthesis for 20 years, complained of gingival enlargement in the anterior maxilla. The case was diagnosed by clinical, radiographic and histopathological findings, characterized by nodular increase of limits defined with atrophy of alveolar process, radiographically, edge with regular radiopaque appearance. Its histological features show metaplastic cartilaginous tissue, epithelial recoating keratinized with hyperplasia irregular of papillae and inflammatory infiltrate. The patient was treated by total excision of the lesion for subsequent oral rehabilitation.

KEYWORDS: Metaplasia, Maxilla, Dental Prosthesis, Case Report.

1. INTRODUCTION

The Osseous and chondromatous metaplasia caused by dental prosthesis in maxillary bones, also known as Cutright's Lesion is considered a benign representation of the cartilaginous and osseous metaplasia. Although it can occur in other body regions, only receives the name of Cutright's Lesion, when it affects the oral cavity, which may be associated with chronic trauma by the use of ill-fitting prosthesis, or result of reactivity of embryonic traces present in the papilla incisive or duct nasopalatine[1,2,3] .

This injury, although rare character and little scientific disclosure has been described in the alveolar process underlying ill-fitting dentures, palate associated with the glandular tissue, or in the tongue associated with lipomas and fibrous tumor[3,4,5]. Histopathologically, may have characteristics similar to sarcomas, which are not significant in maxilla lesions, and usually do not suggest malignancy[2,5,6].

In this context, it is understandable that accurate diagnosis is extremely important for better treatment planning that, in this case, should to be conservative and favorable. Although some authors warn that poorly differentiated lesions may be considered potentially malignant and treated accordingly[5,6,7]. Therefore, this study objective to report a case of reactive metaplasia chondromatous, diagnosed and treated at the Center for Dental Specialties in the city of João Pessoa, Paraiba State, Brazil.

2. CASE REPORT

A 48 years old female was attended of the diagnostic and oral surgery services in João Pessoa, Paraiba State, Brazil, complaining of pain when chewing, when the use of upper dentures .The anamnesis revealed a satisfactory general condition, with no history of systemic disease. Specifically, the patient claimed to be user of total dental prosthesis over about 20 years, and cultivate the habit of smoking for 30 years. When asked about the history of the disease, she said: "noticed 6 months ago an "increase" in the gum below the prosthesis, and nuisance while feeding".

The intraoral clinical examination, there was the presence of a nodular and sessile lesion with a smooth and not ulcerated surface, similar to the adjacent mucosa; and a fibroelastic consistency, measuring approximately 0.5 cm in greatest diameter, being located in the alveolar crest of anterior alveolar edentulous upper jaw. It was noted that the prosthesis had no stability, retention from the bone crest and poor oral hygiene. Additionally, was observed in a discrete bulging in the anterior bone surface of lesion, but not saw to the examination outside face. It is no presence of lymph nodes infarction during palpation of the head and neck.

To complement the clinical and diagnostic phase was requested an occlusal radiograph of the maxilla, which showed a radiopaque lesion in the anterior maxilla, oval format, defined outline. Additionally were observed mingling with the anterior nasal spine, in the most poste-

rior region of its perimeter, which corroborates the findings by Lello & Makek[8], about the difficulty of accurate diagnosis of this injury, only when considered clinical and radiographic features. Given these findings, it was decided to excisional biopsy, with fixation in 10 % formalin and stained with hematoxylin-eosin. Histologic characteristics of tissue were compatible with the diagnosis of reactive metaplasia chondromatous showing metaplastic cartilaginous tissue, with intense proliferation, hypercellularity and hyperchromasia associated with an epithelial covering keratinised with irregular hyperplasia of the peculiar tissue slide of the papillae. An inflammatory infiltrate loosely organized and randomly distributed also was observed (Figure 1 and 2).

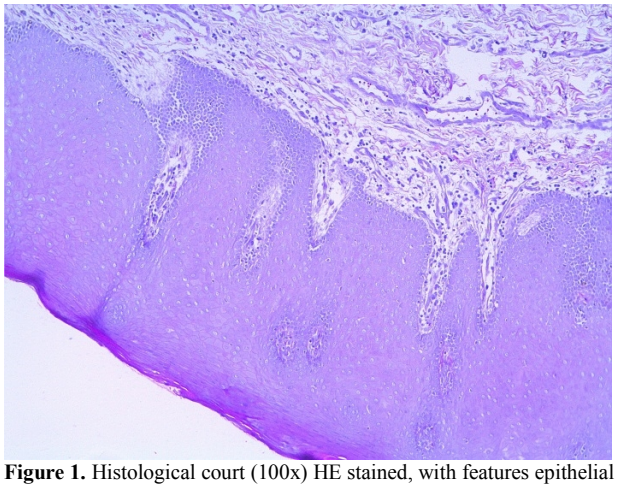

Figure 1. Histological court (100x) HE stained, with features epithelial and conjunctive compatible with the diagnosis of reactive metaplasia chondromatous.

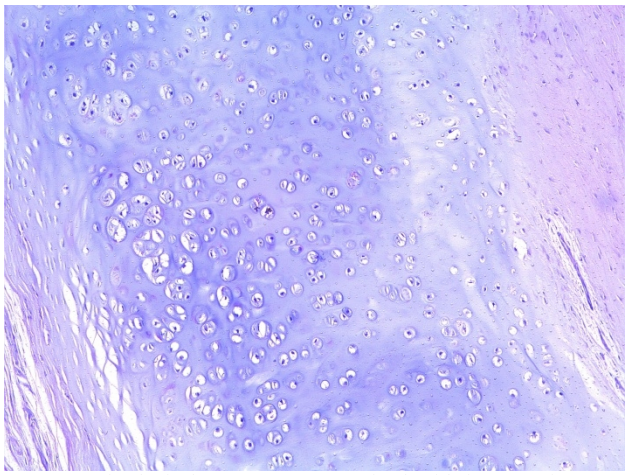

Figure 2. Histological court (100x) HE stained, with features of Young cartilaginous tissue compatible with the diagnosis of reactive metaplasia chondromatous.

The prognosis was considered favorable by the benign nature of this pathology, and therapeutic addressed characterized by proservation case, and full surgical removal. The latest patient follow dated six months after diagnosis, and no recurrence or new lesions was observed in other intraoral region. And the patient could be rehabilitated through making new prosthesis, appropriate and well adapted.

3. DISCUSSION

Occasionally, cartilaginous and bone tissue can be discovered within soft tissue specimen removed from the oral cavity. Cutright[2], pioneer researcher chondromatous metaplasia caused by reactive bone in the oral region, described 31 cases of pathology, listing clinical and histopathological features. The epidemiological profile designed by the researcher showed a predisposition for females, between 5th and 6th decades of life and Caucasian, corroborating the account in question.

The literature describes this type of injury is rare in the anterior maxilla; its development can be established more frequently along the inferior and posterior alveolar ridge of former users of denture ridge atrophic[6,9,10]. However, studies Cutright[2], showed a predilection for the anterior maxilla, also in edentulous individuals, possibly users of total poorly adapted prosthesis, and poor hygiene[3].

The intraoral clinical aspect of the lesion resembled inflammatory fibrous hyperplasia, being very characteristic with the already stunted reported in publications whose clinical features in exophytic nodular lesion, painfull on palpation, are fibrous consistency on palpation and surface ranging from smooth to ulcerated[9,10]. Additionally, it can be observed similarities with lipofibroma, neurofibroma, rhabdomyoma, tumors of salivary glands minor and peripheral ossifying fibroma[6].

The histopathological characteristics can vary from loose to dense stroma of connective tissue with cartilage and bone tissue, and areas of calcification. The cartilaginous tissue may resemble fibrocartilage or hyaline cartilage. This is may contain loci of calcification from individual cells while large calcified areas, which correspond to an amorphous, eosinophilic material. Both may contain areas of progressive differentiation of tissue mesenchymalin osteoclasts [2]. Islands of cartilage are formed amid conjuctive tissue[8], and osteoclasts present in it can have different degrees of cellular atypia, like hyperchromatic nuclei and bi or multinucleated cells, with the worrying for sarcoma diagnosis [9], contrasting the case.

In this case report, the treatment of the lesion was restricted to total surgical excision with safety margin, that we performed for diagnostic purposes. Therapeutic widely applicable to lesions of small diameter in prosthetic regions.

4. CONCLUSION

The reactive chondromatous metaplasia in maxillary bones is rare, nodular, exophytic lesion that affects

mainly users of poorly fitting dentures and extensive resorption of the process alveolar. Can be diagnosed by clinical, histopathological and radiographic's correlation, although sometimes can be hindered by the degree of cellular atypia and presence of associated injuries. The treatment in this case reported was effective and not remissive with accompaniment of 6 months, which supports the benign characteristics of the lesion.

REFERENCES

[1] Basu MK, Evans CRH. Elastic cartilage in the incisive canal region: report of a case. British Journal of oral and maxillofacial surgery, 1989; 27:63-6.

[2] Cutright DE. Osseous and chondromatous metaplasia caused by dentures. Oral Surg Oral Med Oral Pathol., 1972; 34(4):625-33.

[3] Ide F, Horie N, Shimoyama T. Subpontic cartilagenous hyperplasia of the mandible. Oral Diseases. 2003; 9(I 4):224–5.

[4] Hughes CL. Intraoral lipoma with osseous metaplasia. Oral Surgery, Oral Medicine, Oral Pathology, 1966; 21(I 5):576–8.

[5] *NEVILLE* BW, *et al*. *Patologia* Oral & Maxilofacial. 3ª ed. Rio de Janeiro: Elsevier; 2009; 972.

[6] Huvos AG, Bonetumors. Diagnosis, treatment, and prognosis, 2nd ed. Philadelphia: WB Saunders. 1991; 395-401.

[7] Lello GE, Makek M. Submucosal nodular chondrometaplasia in denture wearers. JProsthet Dent, 1985; 54:237-40.

[8] Daley TD, Damm DD, Wysocki GP, Weir JC. Atypical cartilage in reactive osteocartilagenous metaplasia of the traumatized edentulous mandibular ridge. Oral Surg Oral Med Oral Pathol Oral RadiolEndod., 1997; 83(1):26-9.

[9] David G, Gardner DG, Paterson JC. Operative oral surgery Chondroma or metaplastic chondrosis of soft palate. Oral Surgery, Oral Medicine, Oral Pathology., 1968; 26(I 5): 601–4.

[10] Lira De Farias, BA, Orestes-Cardoso AJ, Orestes-Cardoso S, Oliveira Filho MG, Orestes-Cardoso MS. Lesões da mucosa oral em pacientes portadores de próteses dentárias: ilustrações clínicas e abordagem preventiva. Revista Odonto, 2008; 16(31).

HUMAN IMMUNODEFICIENCY VIRUS - HIV: A REVIEW

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ABSTRACT

The Human Immunodeficiency Virus - HIV is responsible for causing Acquired Immunodeficiency Syndrome – AIDS. This virus also affects millions of people in the whole world, generating large global impact. It is a member of the lentivirus family of animal retrovirus and has an affinity for defense cells of the body, which the main target is the CD4 + T lymphocytes. Once connected to a component of this cell, the HIV will penetrate it and multiply, destroying them, by weakening the immune system, making it fragile and susceptible to opportunistic diseases. There are two known types of HIV, which are deeply related, named as HIV-1 and HIV-2. HIV-1 is the main cause of AIDS, HIV-2 differs in genomic structure and antigenicity, also causes the disease, but with slower progression. AIDS is the clinical manifestation generated by HIV, once the immune system is compromised. It is estimated that, in Brazil, 718 000 people living with HIV / AIDS. There is, currently, no effective vaccine or cure for AIDS, however effective antiretroviral therapies have been used. Through this literature review the paper aimed to show on the HIV virus, its general features, its immunological changes, the national level of this epidemiology, the diagnosis and treatment, warning about the importance of this infectious agent and its prevention, towards control and reduction to the AIDS epidemic.

KEYWORDS: HIV, immune system, immunodeficiency.

1. INTRODUCTION

Recognition of Acquired Immune Deficiency Syndrome (AIDS) began around 1981 in the United States (US), due to the increased number of patients living in San Francisco or New York, male, gay and adult sex, which presented immune suppression of the immune system, *Pneumocystis carinii* pneumonia and Kaposi's sarcoma[1,2,3].

The Human Immunodeficiency Virus (HIV) causes AIDS. This infection is through the transfer of viral particles present usually in the blood, semen, vaginal fluid of an infected individual to another uninfected, and condom use one of the main prevention means[1,2,5], vertical transmission is also a form of contagion, where there is transfer of the mother's virus to her child during pregnancy, childbirth or breastfeeding[6].

After purchasing the viral envelope glycoproteins virus reach the defense cells, causing immunological changes, the main lymphopenia caused by direct lysis of CD4 + T lymphocytes (CD - Cluster of Differation, specific group number 4), leading to functional defects in immune system. Treatment is by means of antiretroviral drugs (ARVs) which aims to block HIV replication cycle[1,2].

Despite the HIV virus is well known and widespread, the growth in the number of infected individuals is a global concern, as demonstrated by the high mortality rate from the disease progression in humans. Through this literature review sought to show on the HIV virus, their general characteristics, main immunological changes, bring information to forms of prevention, diagnosis, treatment and epidemiology at the national level, contributing to awareness and decrease in the number of cases.

2. MATERIAL AND METHODS

In order to produce the present study, we conducted a research of keywords in the databases: PubMed, Lilacs and SciELO. The Keywords used were HIV, immune system, immunodeficiency. We selected the most relevant studies, which correspond to the period 2000 to 2014.

3. LITERATURE REVIEW

General characteristics of HIV

HIV belongs to the family *Lentiviridae*, animal retroviruses, identified as two strains, HIV-1, which was isolated from patients with AIDS in 1983, known as the most virulent to attain all the world's population; The

second strain, called HIV-2, was discovered in 1986 and is found primarily in West Africa[3,6,7].

HIV-1 is classified according to its nucleotide sequence into three groups: M (main), O (outlier) and N (non-M, non-O), presenting genetic variability, with the M group the main cause of AIDS globally[2].

In its structure, the virus has two identical standing up strands of genomic RNA, measuring 9.2 kilobase[8] of positive polarity, and three enzymes: integrase, protease and reverse transcriptase. These are packaged in a conical core, which is comprised of a p24 capsid protein, surrounded by a circulant matrix with p17 protein, two envelope lined by a phospholipid membrane, originated from the host cell, which presents viral glycoproteins including gp120 and gp41 decisive for infection. Non-covalently bound to transprotein gp41 gp120 has high affinity for CD4 + and expressing all potential targets for the virus cells[6,7]. Following binding of gp120 to CD4 receptor is necessary that conformational changes occur, to facilitate attachment to the correceptor then the entry of the virus into the cell[4].

Characteristics of the immune system

The immune system has the function of protecting the body against infectious agents, consisting of cells, tissues and molecules[9], is divided into primary and secondary lymphoid organs. Leukocytes known as white blood cells are the immune cells of the body, among these are the CD4 + T lymphocytes that are produced in the thymus and are responsible for organizing and command responses by the actions of aggressors[10,11].

Immunity can be natural or acquired, natural, presents defense against microorganism, with an initial line of defense, having biochemical and cellular defense mechanisms and is programmed to act quickly to infections. The adaptive immune response or have acquired the ability to remember, responding in cases of repeated exposure to more aggressively when a microorganism is known, and have specificity for different molecules, having as main components lymphocytes[1].

The acquired immune response has two types, humoral immunity and cellular immunity. Known as humoral, that is mediated by molecules present in the blood and mucosal secretions, called antibodies, which are produced by B lymphocytes by T-lymphocyte mediated cellular immunity acts on intracellular microorganisms such as some bacteria and viruses causing the destruction of these or of infected cells, promoting the removal of reservoirs of infection[1].

In acquired immunity there are three main cellular types involved in this process: T cell that matures in the thymus, cell B is mature in the bone marrow and a third type known as antigen-presenting cell (APC) such as macrophages and dendritic cells the these interact in a complex manner to the immune response that occurs as a whole[6,7].

Immunological characteristics of the HIV

In addition, to the high affinity of the viral glycoprotein gp120 to cellular receptors, especially CD4, it is necessary a group of chemokine receptors, which act as a coreceptor for HIV, are known as the principal chemokine receptor type 5 (CCR5) and receiver chemokine type 4 (CXCR4), they facilitate viral entry into the cell[4,9].

The CD4 + T lymphocytes are considered target cells from infection by HIV, they have high levels of CD4 and expressing co receptor. There are also other types of cells that can be infected by HIV, they express low levels of CD4 and co receptor are known as macrophages, dendritic cells and microglia cells[1,4,9]. This binding of gp120 to the receptor and co receptor allows a domain of viral glycoprotein gp41 inducing fusion of the virion to the target cell cytoplasm, leading to release of the core of HIV to the cytoplasm of the host cell, initiating the viral reproductive cycle[12].

In the cytoplasm of the cell, the viral RNA is retrotranscribed into a double-encoded DNA strand (cDNA), i.e. by the enzyme reverse transcriptase. Subsequently the cDNA binds to viral and cellular proteins to form a nucleoprotein pre-integration complex, which goes into the cell nucleus. The viral integrase enzyme also adheres to the core catalyzing the coupling of the viral cDNA into the genome of the host cell. Thus the integrated cDNA is now called provirus, may remain idle for a specified time, with little or no production of viral protein. This process occurs in individual cells seemed to be CD4 + memory T cells and macrophages sleepers, yielding the latent form of the virus[1,2,4,12].

To place the transcription of HIV provirus the presence of its long terminal repeats necessary, known as long-terminal repeats (5'LTR) where a gene promoter and enhancer sequences; also necessary to make the sequences that collaborate in polyadenylation, located in 3'LTR. In the promoter are ligated cellular transcription factors NF-kB (nuclear factor kappa B) and (SP1 selective promoter factor 1) to be transcriptional activation. However, this transcript only becomes present when there is activation of T cells and macrophages. After activation few full-length transcripts are formed in the core, they produce messenger ribonucleic acid (mRNA) encoding regulatory proteins, and even transported from the nucleus to the cytoplasm of the cell, where they are translated. As for the structural proteins are produced from the accumulation of regulatory proteins in the nucleus[1,2,4,12].

Like other retroviruses, HIV has three structural proteins. Its proteins as described above, are responsible for most of their origin, are known as gag (group-specific antigen), pol (polymerase) and env (envelope), such

proteins has the function, respectively, encoding the viral proteins of the viral core, production of enzymes that assist in replication and integration of the virus and finally the envelope glycoprotein production. There are also six other genes encoding proteins and contribute to the regulation of viral replication and infectivity are classified as regulatory genes Tat (transactivator) and Rev (regulator of viral expression) essential for viral replication and transported to the nucleus by binding to HIV RNA. The Tat protein will join the 5 'end of the transcript of HIV, and cellular factors, accelerating to 1000 times the full production of transcripts. Have the Rev protein binds to the isolated transcripts or unprocessed allowing your core output[1,2,4,12].

The HIV genome also encodes the accessory proteins, Nef (negative regulatory factor), vif (viral infectivity), Vpr (Viral protein R) and Vpu (U viral protein) responsible for efficient virus production[1,2,4,12].

The structural genes have long polypeptide chains produced by mRNA, which is subsequently cleaved by viral protease into mature proteins in the cytoplasm. The result of the cleavage of Gag gene are four proteins: CA (capsid, p24), MA (matrix, p17), NC (nucleocapsid p7) and p6; have the env gene produces glycoproteins, gp120 and gp41, these are structured as trimers in the viral envelope. Finally, the cleavage of the pol gene, which will result in the formation of three proteins essential for virus multiplication, are also known as p11, p66/ p51 and p32, are found in the same protease enzymes, reverse transcriptase and integrase respectively . The proteins mentioned organize and form the cores of HIV which undergo sprouting containing the glycoproteins gp41 and gp120 in the plasma membrane resulting in the HIV virion, is released from the host cell into the surrounding medium, which may or may not infect new cells[2,4,9].

Disease Stages

The natural history of HIV disease, has beginning in the transmission of the virus to the individual death is defined as a natural progression of the infection without antiretroviral therapy[13]. The HIV infection is characterized by four phases: acute or primary infection, asymptomatic phase or clinical latency, initial or early symptomatic phase and AIDS [3].

The acute phase is the period which corresponds from the transmission of disease to the formation of anti HIV antibodies, are observed with high levels viraemia marked decline in CD4 + T cells and an increase in CD8 + circulating lymphocytes[13]. The most common symptoms are fever, sweating, malaise, myalgia, anorexia, nausea, diarrhea and pharyngitis non-exudative, and headache, photophobia, meningism and maculopapular rash may occur neurological symptoms in a minority and aseptic meningitis, encephalitis, peripheral neuropathy is a polyneuropathy acute ascending known as Guillain-Barré syndrome. In some cases may occur aphthous ulcers or esophageal[14]. The symptoms are self-limiting, and last an average of 14 days, their persistence may be associated with more rapid progression to AIDS[3]. Acute infection is controlled only partially by the adaptive immune response and advances to the progressive infection of peripheral lymphoid tissues. At this stage, HIV virions penetrates the individual cells by fusion events, mediated by cellular receptor gp120/ gp41[1].

After primary infection there is a second phase of the disease, where the infected patient may remain asymptomatic for several years, may also have some very specific symptoms such as persistent generalized lymphadenopathy, fatigue, low-grade fever, night sweats, intermittent diarrhea and weight loss[14]. This phase of the disease is called the HIV latency period where new viruses are produced in low levels, only a few T cell harboring the virus, but the destruction of CD4 + T cell progresses slowly in lymphoid tissues and the number of such cells decreased progressively in blood. The body continues to produce, however are destroyed with the same speed with which they are produced. Over a period of years, this continuous cycle of infection and death of T cells and new infections lead to a steady decline in the number of CD4 + T cells in lymphoid tissues and circulating[1].

In early symptomatic phase, some symptoms present nonspecific and variable intensity, the changes are night sweats, weight loss and thrombocytopenia. The most common opportunistic processes found in this phase are known as oral and vaginal candidiasis, oral hairy leukoplakia, gingivitis, aphthous ulcers, diarrhea, sinusitis, recurrent herpes simplex and herpes zoster[3].

The last stage of the HIV infection, AIDS, is characterized by drastic increase viraemia, increasing the replication of the virus rapidly and without control. Presents combinations of opportunistic infections, cancer, cachexia, renal failure and degeneration of the central nervous system. The patient becomes susceptible to various diseases due to marked decrease in CD4 + T cells, reaching very low levels. Many tumors that appear in individuals with AIDS are due to viral and incapacity of the patient infected by HIV mount an immune response against oncogenic viruses[1,14].

Epidemiology

According to the Department of STD, AIDS and Viral Hepatitis, since when did the epidemic in 1980 until June 2012, Brazil has 656,701 registered cases of AIDS. It is currently estimated that the country about 718 000 people living with HIV/AIDS. In 2012 were reported 39,185 cases of the disease in the country, remaining stable this value in the last five years, leaving the national detection rate of 20.2 cases per 100,000 inhabit-

ants (Figure 1).

Were declared in 2012, 11,896 deaths from AIDS in the country, accounting for one by AIDS mortality rate of 5.5 per 100,000 inhabitants. Taking into account the accumulated data from 1980 to 2013 were notified, declared and registered a total of 686,478 AIDS cases. These cases where 445,197 - 64% correspond to the male and 241,223 sex - 35.1% female, this total cases registered between 1980 and June 2013, 379,045 (55.2%) are the Southeast, 137,126 (20.0%) of the South, 95,516 (13.9%) in the Northeast region, 39,691 (5.8%) in the Midwest and 35,100 (5.1%) in the North region[15].

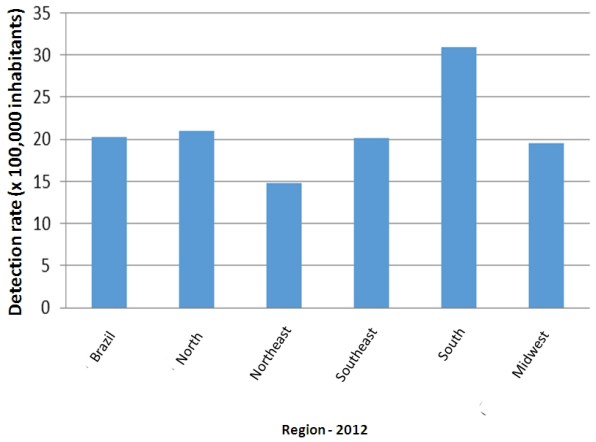

Figure 1. AIDS detection rate for Brazilian regions in 2012. In 2012 the detection rate of people living with HIV/ AIDS in Brazil was 20.2 / 100,000 inhabitants. In the Brazilian regions, we could observe the highest detection rate in the South, 30.9 / 100,000 inhabitants, followed by the Northern region 21.0, Southeast region 20.1, Midwest 19.5 and Northeast region 14,8[15].

In 2012 the men the AIDS case detection rate was 26.1 per 100,000 population, while for women it was 14.5. In both sexes, the age group in which AIDS is more prevalent is the 25-49 years old. Regarding the mode of transmission, the prevailing sexual among over 13 years old. Even in higher concentration the number of AIDS cases in males among heterosexuals, there is a large concentration of the epidemic in the country in groups with behaviors in which they are vulnerable to an increased risk of HIV infection, such as homosexuals, sex workers and drug users[15].

Laboratory diagnosis

Following infection, antibodies to HIV are, on average, 3 to 12 weeks in serum or plasma[3]. Essentially are divided into four groups of tests for detection of HIV, known as antibody detection tests, antigen detection tests, culture technique, and the virus genome amplification assays. Routinely used in the initial screening antibody detection tests against the virus, known as Enzyme Linked Immuno Sorbent Assay (ELISA) is intended for the detection of antibodies, anti-p24, gp41 and gp120, and is considered a highly sensitive and specific test. For confirmation of positive ELISA test, it is necessary to conduct the Western blot test (WB), which are detected viral proteins[3,16].

In its second edition the technical manual for the diagnosis of HIV infection currently is approved by Ordinance No. 29 of 17 December 2013. The manual provides STD and AIDS Department's policies for the diagnosis to be amplified and are including people who are diagnosed and can start treatment soon after confirmation of diagnosis, contributing to quality of life of and reducing the likelihood of HIV transmission. The main purpose of this manual is to expand the possibilities for diagnosis and also mainly instruct healthcare professionals to secure completion of the diagnosis of infection, comprising in its six flowcharts infrastructure that allow the diagnosis, enabling this in different locations and situations with laboratory infrastructure or not taking active responsibility to meet all looking for this diagnosis[17].

Treatments

In November 1996, Brazil became the first country to make available free of charge through the Unified Health System (SUS), all drugs necessary for the treatment of patients living with HIV / AIDS[18].

Are currently used in Brazil, four classes of antiretrovirals, which are considered more potent and less toxic, divided as Nucleoside Reverse Transcriptase Inhibitors (NRTIs) Nucleoside Inhibitors No Reverse Transcriptase (INN-TR), inhibitors protease (IP), and Integrase Inhibitors[19].

Antiretrovirals NRTIs are drugs that block the action of the enzyme reverse transcriptase. Activation of nucleoside inhibitors of metabolites occurs in the first phosphorylation. Due to difficulties in many molecules monophosphorylated be created is analogous drugs possessing a nucleotide phosphate group in its structure, requiring only two phosphorylations to prevent transcription of RNA into DNA, and thus preventing viral replication. Hoewver, the antiretroviral group NNRTI are considered as non-competitive binding to an allosteric site of the enzyme. This interaction causes the active site responsible for the formation of the double helix of DNA, has restricted their mobility and flexibility, which results in a drastic reduction in enzyme efficiency[20].

Protease inhibitors (PIs) interfere in the last stage of viral replication, preventing the formation of new viruses. Protease is the enzyme responsible for processing the gag and gag-pol polyproteins, these are responsible for the formation of structural and functional proteins formed virus particles[20].

Finally, are known drugs that inhibit integrase, which are considered one of the new classes of anti-HIV drugs,

with low toxicity compared to other drugs[12]. The integrase enzyme is responsible for inserting the proviral DNA into the host chromosome and catalyze the incorporation of this proviral DNA into the genome of the infected cell, which is essential for viral replication[20].

Prevention

According to the Department of STD, AIDS and Viral Hepatitis the most efficient way of AIDS prevention is the use of condoms in all sexual relations, decreasing the risk of transmission to 5%[17], *blood or blood products, semen, body fluids and breast milk of infected person should be avoided for contacts unprotected*[2].

In pregnant women, for prenatal tests should be performed to detect viruses and if positive for HIV treatment must be performed in order to prevent contamination of the embryo in order that vertical transmission, ie from mother to child can occur often in utero or during birth, there is also the possibility of transmission through breast milk[1].

Health professionals can be contaminated through occupational transmission, generated by the accident at work, where they can be injured with cutting and sharp instruments contaminated with blood of patients with positive serology for HIV. Some factors that may contribute occur occupational contamination, such as the extension and the depth of the wound, the presence of blood in the instrument causing the accident and the patient is a source with a high viral load with advanced immunodeficiency signals. Control measures should be adopted in order to minimize the risk of transmission by this type of contamination among which we highlight: the effective practice of biosecurity standards in invasive procedures to implement new technologies and the study to determine the risk factors associated seeking their elimination[3].

Routine screening for HIV in blood donors have significantly reduced the rich transmission this way. To control the epidemic by HIV effective prevention is extremely important, adopting public health measures to decrease the use of contaminated needles used by intravenous drug user and the use of condoms, even among HIV-positive partners, avoiding reinfection of viral strains resistant to drugs which can have serious complications health, and campaigns on HIV/ AIDS for public awareness[1,17].

4. DISCUSSION

The human immunodeficiency syndrome yet acquired is a challenge for medicine, however, major advances in research has enabled accurate diagnoses and effective treatments, promoting the survival of HIV/ AIDS. Via the public health policy allowed to join the diagnosis, treatment and follow-up, which brought improved quality of life and new perspectives. Overall Brazil has advanced as to the means of dissemination through campaigns on prevention and encouragement in testing. Government actions mediated programs a strategy of reduction and elimination of new cases, keeping track of the epidemic, however the involvement of all this preventive current is necessary to achieve this goal.

Despite the government action the effects are devastating in society as a whole, AIDS has no cure established, despite scientific and therapeutic advances the clinical picture of the disease has cost many lives. Many allies of AIDS, such as discrimination, prejudice and lack of knowledge, should be considered for a confrontation set of combating the epidemic. Strategies for prevention, early diagnosis combined with promotion of treatment are established actions that should be considered as an effective way to combat new HIV infections, intolerance and reduced AIDS deaths.

5. CONCLUSION

Despite constant efforts of science in search of permanent cure for HIV, yet we know that this outcome was not completed, totaling a high morbidity and mortality national and world, becoming, since its discovery, a major epidemic, can be considered a pandemic. The weakening and the weakness of the immune system occur by lysis or decrease in lymphocytes of type CD4 +, a cell that is part of the defense system, making the white blood cells, it causes the body becomes susceptible to opportunistic infections and/ or tumors, since these are responsible for organizing and directing the response by the aggressors attack. The adherence to antiretroviral therapy has provided better quality of life and has contributed to decrease the spread of HIV. However, prevention is still the best way to control the disease, since its spread is mainly through sexual contact, leading to many individuals to become vulnerable. The changes caused by the fact that HIV compromises the immune system, hence the importance of investments in research, awareness, government and popular actions, so there in the near future to reduce the epidemic and the much desired cure this disease.

REFERENCES

[1] Abbas AK, Lichtman AH, Pillai S. Imunologia celular e molecular. 7. ed. Rio de Janeiro: Elsevier; 2011. Cap 20; 458-70.

[2] Murphy K, Travers P, Walport M. Imuno biologia de Janeway. 7. ed. Porto Alegre: Artmed; 2010. Cap 12; 525-44.

[3] Balestieri FMP. Imunologia básica. São Paulo: Manole, 2009.

[4] Ferreira RCS, Riffel A, Sant'Ana AEG. HIV: Mecanismo de replicação, alvos farmacológicos e inibição por produtos derivados de plantas. Rev Quim Nova. 2010;

33(8): 1743-55. Disponível em: http://www.scielo.br/scielo.php?pid=S0100-40422010000800023&script=sci_arttext

[5] Cardoso ARS, Lima LRA, Silva RCR, Cabral LGA. Atividade física de crianças e adolescentes que vivem com HIV adquirido por transmissão vertical. Rev Bras Ativ Fis Saúde. 2014; 19(2):223-33. Disponível em: http://periodicos.ufpel.edu.br/ojs2/index.php/RBAFS/article/view/3172

[6] Coico R, Sunshine G. Imunologia. 6. ed. Rio de Janeiro: Guanabara Koogan S.A; 2010. Cap 17; 268-74.

[7] Benjamini E, Coico R, Sunshine G. Imunologia. 4. ed. Rio de Janeiro: Guanabara Koogan S.A; 2002. Cap 1;1-8.

[8] Arruda LB. Caracterização molecular da gp120 do HIV-1 e suas implicações sobre o tropismo pelos correceptores CCR5 e CXCR4 [tese]. São Paulo: Universidade de São Paulo; 2014. Disponível em: http://www.bv.fapesp.br/pt/bolsas/113005/caracterizacao-molecular-da-gp120-do-hiv-1-e-suas-implicacoes-sobre-o-tropismo-pelos-correceptores-c/

[9] Sharon J. Imunologia Básica. Rio de Janeiro: Guanabara Koogan S.A; 2000. Cap 15; 207-13.

[10] Ministério da Saúde. Departamento de DST, aids e hepatites virais [Online]. Brasília, Brasil; 2014. Cap 09. Disponível em: http://www.aids.gov.br/

[11] Santos C, Silva JAF, Bittencourt G, Mota J, Navarro F. O efeito do exercício físico agudo e crônico na resposta imunológica de indivíduos portadores do HIV. Rev Bras de Presc e Fisio do Exerc. [Internet]. 2007; 1(4):01-16. Disponível em: http://www.rbpfex.com.br/index.php/rbpfex/article/viewFile/32/31

[12] Santos MLA, Albuquerque MG, Brito MA. Integrase: Um alvo terapêutico importante no combate à infecção HIV/AIDS. Rev Virtual Quim. 2014; 6(4):937-54. Disponível em: http://www.uff.br/RVQ/index.php/rvq/article/download/567/444&rct=j&frm=1&q=&esrc=s&sa=U&ei=TpBrVLegDsWogwT9_YII&ved=0CBYQFjAA&usg=AFQjCNHLFkKAviTGkbN4KbgYGDZq_Pcpxg

[13] Vanni AC. Análise das características genéticas da região V3 e do tropismo pelos co-receptores CCR5 e CXCR4 do Vírus da Imunodeficiência Humana tipo 1 subtipos B, C e recombinantes BC através de ferramentas genotípicas [Dissertação]. Rio Grande do Sul: Universidade Federal do Rio Grande do Sul; 2011. Disponível em: http://www.lume.ufrgs.br/handle/10183/49271

[14] Hermes RB. Investigação dos polimorfismos nos genes FAS e FASL em indivíduos infectados pelo vírus da imunodeficiência humana-1 (HIV – 1). [Dissertação] [Internet]. Belém: Universidade Federal do Pará, Instituto de Ciências Biológicas; 2009. Disponível em: http://www.baip.ufpa.br/arquivos_baip/teses_dissertacoes/Renata_Bezerra_Hermes.pdf

[15] Ministério da Saúde (BR), Secretaria de vigilância em Saúde – Departamento de DST, Aids e Hepatites Virais. Boletim epidemiológico HIV/AIDS. Brasília: Ministério da Saúde, 2013. Disponível em: http://www.aids.gov.br/publicacao/2013/boletim-epidemiologico-aids-e-dst-2013

[16] Schuster AD, Lise MLZ, Hoerlle JL. Avaliação sorológica de HIV por técnicas de ELISA de quarta geração. Rev Epidemiol Control de Infect. 2013; 3(4):122-7. Disponível em: https://online.unisc.br/seer/index.php/epidemiologia/.../3249.

[17] Ministério da Saúde (BR), Secretaria de Vigilância em Saúde - Departamento de DST, Aids e Hepatites Virais. Manual Técnico para o Diagnóstico da Infecção pelo HIV [Internet]. Brasília: Ministério da Saúde, 2014. Disponível em: http://www.aids.gov.br/noticia/2014/manual-tecnico-para-o-diagnostico-da-infeccao-pelo-hiv-0

[18] Vielmo L, Campos MMA, Beck ST, Andrade CS. Atenção farmacêutica na fase inicial de tratamento da AIDS como fator importante na adesão aos antirretrovirais. Rev Bras Farm. 2014; 95(2):617-35. Disponível em: http://www.rbfarma.org.br/files/646-Atencao-farmaceutica-na-fase-inicial-de-tratamento-da-AIDS-como-fator-importante-na-adesao-aos-antirretrovirais--FINAL.pdf

[19] Bonifácio FPS, Godoy FSP, Francisco DKF, Oliveira LC. Alterações metabólicas associadas à terapia antirretroviral em pacientes HIV positivo. Cadern Esc Saúde. 2013; 1(9):139-49. Disponível em: apps.unibrasil.com.br/revista/index.php/saude/article/view/.../937

[20] Cunico W, Gomes CRB, Vellasco WT Jr. HIV-Recentes avanços na pesquisa de fármacos. Rev Quim Nova. 2008; 31(8):2111-17. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0100-40422008000800035

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CORNEAL TRANSPLANTATION: FACTORS INVOLVED

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ABSTRACT

Corneal transplantation is an important ophthalmic procedure whose purpose is not limited to only promote visual rehabilitation who need this procedure, but also facilitate the social reintegration and into the labor market, for those who are economically active. It is still considered the most successful procedure to tissue transplants performed in humans. It can be classified in full corneal transplantation and partial corneal transplantation. The main complications involving this procedure are the rejection, secondary glaucoma and infectious keratitis. Given this context, the present study was developed with the proposal to emphasize all this importance of corneal transplantation as a means of visual recovery, as well as discuss the main care to try to avoid possible complications and subsequent graft rejection.

KEYWORDS: Corneal transplantation, complications of keratoplasty, keratoplasty penetrating.

1. INTRODUCTION

The cornea is composed of five distinct layers including epithelium, Bowman's layer, stroma, the Descemer membrane and the endothelium[1]. Corneal transplantation (CT) can understand the complete replacement of tissue thickness (penetrating keratoplasty) or partial (lamellar keratoplasty or profound lamellar[2]. The indications for transplantation can be tectonic or reconstructive, optical or functional, therapeutic or cosmetic, thus making one of the most frequently performed transplants because of the technical facilities and the number of donated organs[3].

The CT keratoplasty or behaves like one of the most important procedures in ophthalmology in respect of visual recovery in an individual company[4]. It is also considered the most successful procedure between tissue transplants conducted on human success[5]. Procedural success is due to factors such as a lower risk of rejection, when compared to other transplants, due immunological aspects, and because the cornea is an avascular organ[6].

The prognosis involving keratoplasty is multifactorial[7,8]. In the case of Penetrating Keratoplasty (PK) postoperative evolution is directly related to factors inherent in the basic clinical ocular disease responsible for surgical indication. However, there are still unexpected postoperative complications that occur in patients with few risk factors who underwent CT uneventful[7].

This work aims to report briefly the importance of cornea transplantation today as a form of visual recovery, as well as alert to possible complications that may arise and that, consequently, can lead to rejection and graft rejection.

2. MATERIAL AND MÉTHODS

This study is a literature review of Corneal Transplantation. For the research we used the PubMed, Lilacs and SciELO with the following keywords: Corneal transplantation, penetrating keratoplasty and complications of keratoplasty. Thus, we selected the most relevant articles of recent years, which correspond to the period 1997 to 2014. For the bibliographic citation was used Endnote X7 software for Mac.

3. DISCUSSION

The CT scan can be performed from different purposes, such as optical which aims at promotion of vision; tectonics in order to restore the structural integrity of the eyeball and further treatment with the intention of controlling the disease of the cornea which in turn is refractory to medical treatment[9]. Infectious keratitis resistant to medical treatment behaves as the main indication for therapeutic CT[9].

Complications after penetrating keratoplasty

The Post Penetrating Keratoplasty (PPK) the glaucoma represents a significant clinical problem because of their frequency of occurrence, difficulty in diagnosis, monitoring and the complexity of treatment[7]. Among the complications PPK presents itself as the leading cause of blindness, since it leads to graft failure and irreversible damage of the optical disc due to elevated intraocular pressure[10,7].

Rejecting the CT occurs when there is recognition

and awareness of the host to donor[5]. This is a cellular immune response and humoral that may occur in the 14 days to 30 years after transplantation[11,12]. This can be epithelial, stromal, endothelial or in the three areas[5]. Since the primary target endothelium in graft rejection, which can lead to graft failure, lamellar keratoplasty is potentially more advantageous when compared to PK, once rejection episodes are less severe[13]. It is the most frequent and common complication which can lead to irreversible graft failure[14]. Despite advances over the years the control over the rejection of the CT is not well understood, therefore, early recognition of rejection and his aggressive treatment consist of the most effective strategy[7].

There are several predisposing factors involved in transplant rejection process, including corneal vascularization is the surgeon's experience, the age of the donor patient, the diameter of the button once transplanted greater closer to the limbal vessels and therefore greater the chance of rejection, the existence of prior transplants, the presence of adhesions and an increase in intraocular pressure postoperatively[5]. Therefore, the incidence of rejection is associated with an indication of the presence of CT and preoperative risk factors[11]. It is believed that this rate is around 30%[6].

Although uncommon, infectious keratitis behaves as a serious complication PPK, which leads to loss of transparency of the graft in most patients[7]. It is taken as true that low socioeconomic status of patients have a higher relative risk for failure CT[7].

4. CONCLUSION

A growing number of corneal transplant procedures have been carried out every year. However, one should be aware of the complications that can arise in order to avoid graft rejection.

REFERENCES

[1] Riordan-Eva P. Anatomia e embriologia do olho. In: RIORDAN-EVA, P.; WHITCHER, J.P. Oftalmologia geral de Vaughan & Asbury. Porto Alegre: Ed.AMGH, 2011; 1-28.

[2] Sano FT, Dantas PEC, Silvino WR, Sanchez JZ, Sano RY, Adams F. *et al*. Tendência de mudança nas indicações de transplante penetrante de córnea. Arq Bras Oftalmol. 2008; 71(3):400-4.

[3] Flores VGC, Dias HLR, Castro RS. Indicações para ceratoplastia penetrante no Hospital das Clínicas-UNICAMP. Arq Bras Oftalmol. 2007; 70(3):505-8

[4] Moreno GL, Souza LB, Frekitas D, Sato EH, Vieira LA. Transplante de córnea e o conhecimento do procedimento pelos pacientes. Arq Bras Oftalmol 2003; 66:797-801.

[5] Chalita MRC, Diazgranados EBM, Sato EH, Branco BC, Freitas D. Rejeição corneana pós transplante de córnea: análise de dados do Banco de Olhos do Hospital São Paulo - Escola Paulista de Medicina. Arq. Bras. Oftal. 2000; 63(1).

[6] Netto MJC, Giustina ED, Ramos GZ, Peccini RFC, Sobrinho M, Souzal B. Córnea em um serviço de referência no interior de São Paulo (Sorocaba - SP, Brasil). Arq Bras Oftalmol. 2006; 69(5):661-4

[7] Endriss D, Cunha F, Ribeiro MP, Toscano J. Ceratoplastias penetrantes realizadas na Fundação Altino Ventura: revisão dos resultados e complicações. Arq Bras Oftalmol 2003; 66:273-7

[8] Vail A, Gore SM, Bradley BA, Easty Dl, Rogers CA, Armitage WJ. Conclusions of the corneal transplant follow up study. Collaborating Surgeons. Br J Ophthalmol 1997; 81:631-6.

[9] Oliveria FC, Dantas PEC, Marco ES, Oliveira AC, Nishiwaki-Dantas MC. Transplante terapêutico de córnea: resultados prolongados de série de casos. Arq Bras Oftalmol. 2007; 70(4):625-31

[10] Soares MEB, Cronemberger S. Ceratoplastia penetrante e glaucoma. Rev Bras Oftalmol. 2007; 66(4):275-86.

[11] Costa DC, Kara-José N. Rejeição de transplante de córnea. Rev Bras Oftalmol. 2008; 67(5):255-63

[12] Panda A, Vanathi M, Kumar A, Dash Y, Priya S. Corneal graft rejection.Surv Ophthalmol. 2007; 52(4):375-96.

[13] Tuft S. Córnea. In: SPALTON DJ, HITCHINGS RA, HUNTER PA. Atlas de oftalmologia clínica. 3 ed. Rio de Janeiro: Elsevier, 2006. 147-187.

[14] Costa DC, Castro RS, Camargo MSF, Kara-José N. Rejeição de transplantes de córnea: tratamento tópico vs. pulsoterapia - resultados de 10 anos. Arq Bras Oftalmol. 2008; 71(1):57-61.