PREVALENCE OF MALOCCLUSION IN CHILDREN BETWEEN 5 AND 12 YEARS-OLD IN MUNICIPAL SCHOOLS IN ARARAQUARA

Prevalência de maloclusão em escolares de 5 a 12 anos de rede municipal de ensino de Araraquara

Eloisa Marcantonio Boeck [1], **Karina Eiras Dela Coleta Pizzol** [2], **Natalia Navarro** [3], **Nayara Mariani Chiozzini** [4], **Ana Lígia Rozato Foschini** [5]

ABSTRACT

Purpose: to evaluate the prevalence of malocclusion in school children between 5 and 12 years-old enrolled in public schools in Araraquara_S.P. (Brazil). **Method:** based on the total number of children (7235) it was carried out the calculation of sampling, involving seven schools, a total of 3380 children. A pilot study and calibration of examiners preceded the study onset. 1934 children were excluded from the sample because they didn't apply for the inclusion criteria. In clinical evaluation, there were analyzed the inter-arcs in transverse, vertical and sagittal directions, intra-arch relationship, facial profile, growth pattern, presence of asymmetry, and harmful habits. **Results:** of the total sample (1446), 80.29% had malocclusion, being more prevalent in females (81.34%) from 9 to 12 years-old (82.52%). The most prevalent dental relationship was Class I (63.27%), Standard I was the most found facial pattern (92.87%). The predominant inter-arch malocclusions were deep bite and anterior open bite, and the most prevalent intra-arches occlusal changes were spacing and rotation. According to the Chi-square test, there was no significance between malocclusion and the variables: presence of habit, asymmetry, spacing and facial profile. There was a statistically significant difference in the prevalence of variables: open bite, deep bite, spacing, sucking habits (sucking, pacifier, bottle) and the onychophagia habit, when compared the two age groups studied. **Conclusion:** malocclusions affect the most children in this age group, with predominantly dental origin and with little or no facial involvement, obviating the need for early intervention.

KEYWORDS: Prevalence; Malocclusion; Child

(1) D.D.S., Professor from the Dentistry Graduate and Post-graduate courses – Department of Orthodontics, Center University of Araraquara – UNIARA.

(2) D.D.S., Professor from the Dentistry Graduate and Post-graduate courses – Department of Orthodontics, Center University of Araraquara – UNIARA.

(3) Graduate Student at the School of Dentistry from the Center University of Araraquara – UNIARA; Scholarship holder of the Scholarship Program for Scientific Initiation (Programa Institucional de Bolsas de Iniciação Científica) – PIBIC.

(4) Graduate Student at the School of Dentistry from the Center University of Araraquara – UNIARA; Scholarship holder of the Scholarship Program for Scientific Initiation (Programa Institucional de Bolsas de Iniciação Científica) – PIBIC.

(5) D.D.S., Director of the Oral Health Program from the city of Araraquara.

Conflict of interest: non-existent

INTRODUCTION

Malocclusions are oral health problems of interest in Public Health, defined as health problems by the World Health Organization (WHO). They represent significant variations in growth and morphology of dental arches and result as a consequence from the aesthetic dissatisfaction of the individual as well as changes in speech, breathing, posture, chewing, swallowing, temporomandibular joint disorders and pain bucofaciais[1].

Epidemiological data, the malocclusion has the third highest prevalence among oral pathologies, second only to caries and periodontal disease. It is

therefore in the third position of the scale of priorities as to the dental problems of Global Public Health, according to WHO[2].

The same malocclusion may present different levels of severity which, therefore, should receive priority treatment. The early diagnosis and treatment of occlusal changes, undoubtedly favor the growth and proper development of the individual[3, 4], often avoiding its aggravation and surgical evolution of the case.

The causes that promote the evolution of this process are very diverse, which makes the malocclusion to be considered multifactorial, with hereditary, congenital, functional, environmental influences and nutritional, socioeconomic and educational factors[5]. The influences of harmful habits, among them, finger and pacifier sucking, are described in the literature[4,6-9], as a major etiologic factors of malocclusion in the phase of primary and mixed dentitions. Another factor worth mentioning is the presence and duration of breastfeeding. Children who are breast fed for at least 6 months, as recommended by WHO, tend to have lower prevalence of non-nutritive sucking habits, and if they are present, they will be shorter[6,8,10-12].

In Brazil, the Unified Health System (Sistema Único de Saúde – SUS) does not effectively assist occlusion problems. As a significant portion of the population that depends solely on the public system, it is expected that many individuals with malocclusion are not being assisted.

The epidemiological situation of the population is important for planning and implementation of preventive dental services and treatment[13]. Only with substantial data, which represent the actual occlusal condition of the population, which makes it possible to implement public policies focused on prevention of malocclusions and not just the corrective nature of the same.

Regarding the epidemiological data, the latest survey on Oral Health, known as SB Brasil 2003[14], had their data published by the Ministry of Health. In this study, it was observed a prevalence of 36.46% of malocclusion in population, classified as mild, moderate and severe. At the age of five, mild malocclusion was the most frequent (22.1%), followed by moderate or severe (14.5%). In children aged 12, it was found 21% of very severe problems, which demonstrates that malocclusion may worsen with age, highlighting the importance of early treatment.

Other authors[15-19] found higher values for malocclusions, with a prevalence of 80-89% for the same age group. The Class I malocclusion was found most frequently in these studies (39 to 76.7%), followed by Class II (19-42%) and Class III (3 to 14.6%). These studies show that the prevalence of malocclusion is high, but they do not show the severity or the need for treatment therefore being an important factor in public health and then suggests the use of indices in more orthodontic studies for this purpose.

In this perspective, the present study aims to assess the prevalence of malocclusion in school children aged from five to 12 years old, enrolled in public schools in Araraquara.

METHOD

This study refers to prospective transversal observational research conducted with children in the city of Araraquara.

Sample Selection

Through a link provided by the Department of Education, it was given the total number of 7235 children aged from five to 12 years old, enrolled in public schools in Araraquara, in 2010.

Then an official letter was sent to each school requesting an authorization for the survey to be conducted in the school year, thus counting, with a greater number of children involved in the research.

To calculate the sample it was considered the total of children enrolled in the 13 public schools of the city, estimating the prevalence of malocclusion in this age group, with a probability of error of 3% and with a 95% confidence interval. 10% was increased in order to compensate for any losses or refusals to participate. To achieve the required number of children in the sample (n), a random drawing was held, in which seven schools were selected, a total of 3380 children.

To minimize possible errors of the method and the calibration of the researchers involved, we performed a pilot study in two municipal schools. The examiners were calibrated by repeating the process until they obtained a relation intra-class and inter-class higher than 0.8.

Clinical evaluation

The clinical evaluation was done individually, in school chairs arranged in a private room with natural light. Through intra-oral examination, with the naked eye and with the aid of examination gloves and/or wooden spatulas, it was considered the inter-arcs in transverse, vertical and sagittal directions; the intra--arches relation, considering the diastema presence, crowding and early loss of deciduous teeth, and facial profile, growth pattern and the presence or absence of asymmetry, and harmful habits.

During clinical evaluation, 1934 children were excluded from the initial sample (3380) for not being

present on the day of clinical assessment or not meeting the inclusion criteria described below:

Inclusion criteria:

- Children aged from five to 12 years old, both genders enrolled in public schools in Araraquara, with proper parental consent;
- Child in the mixed dentition stage.

Exclusion criteria:

- Children aged above or below the age stipulated by the inclusion criteria;
- Children aged from five to 12 who were not clinically examined by the researchers involved in the research;
- Children who have already undertaken or are in orthodontic treatment;
- Children with extensive carious lesions or with deciduous or permanent teething complete;
- Children with severe systemic diseases or syndromes.

In this way, the final sample consisted of 1446 children, both genders, being 777 females and 669 males.

The project was approved by the Ethics Committee of the Center University of Araraquara – UNIARA under number 1116/10.

The data collected through clinical examination were recorded in a medical record prepared for this purpose and then subjected to statistical analysis so that the results could be the basis for the research proposal. The statistical test used was the chi-square test, with a significance level of $P < 0.05$. For better interpretation of the data, the sample was divided into two age groups: 1. With children from five to eight years old, and 2. With children from nine to 12 years old. The criteria for this division were primarily divided into two age groups covering the same range of years, and second, based on the period of the mixed dentition. As the age of 8 marks, in general, the transition between the end of the first transitional period and the beginning of the inter-transient, in which only the incisors and first molars are permanent, and the age of nine years old, on average, marks the return of exchange tooth (second transitional period), it was considered prudent to this division as a way to see if any occlusal alterations are more common in a certain age group.

The largest number of children in the age group 1 (971) in relation to age group 2 (475), is because the present study has evaluated only children enrolled in municipal schools of education, which has a significantly lower number of children aged older than 10 years old, as after this age, they are usually enrolled in state schools. As the comparison between groups will be held in percentage and not in absolute numbers, this difference will not affect the interpretation of the data.

RESULTS

For a better understanding of the results, they will be presented in the form of tables and figures below.

It is observed in Figure 1 that the percentage of malocclusion in the studied population was high, with higher values in females when compared to males, although this difference has not been shown to be statistically significant.

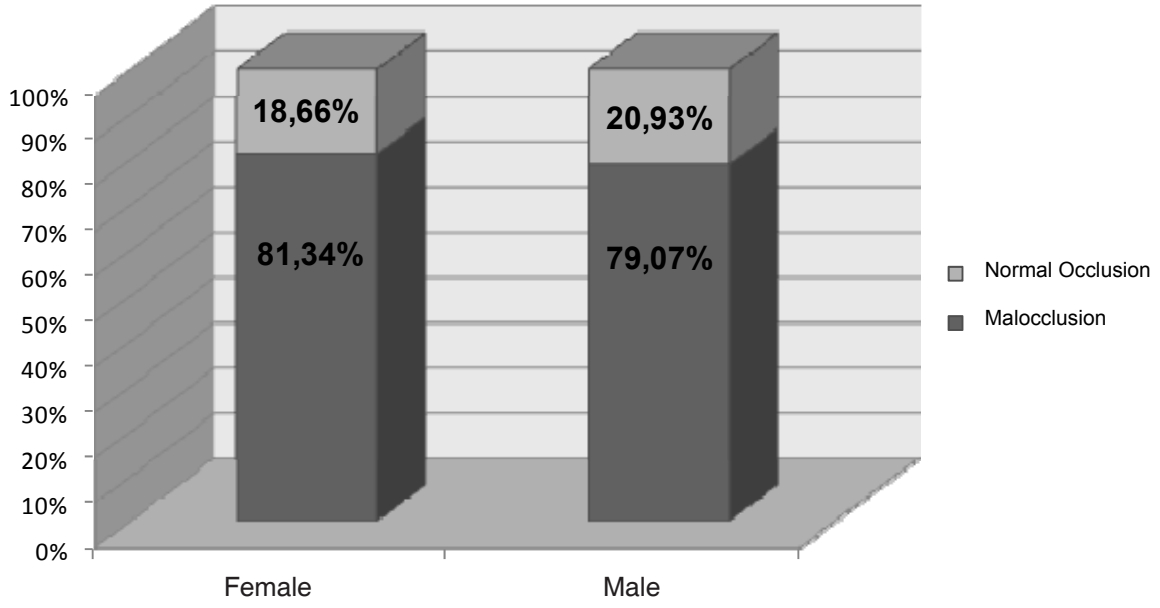

Figure 1 – Percentage of normal occlusion and malocclusion in the sample according to gender

The index of malocclusion in both age groups showed that occlusal changes are more common in older children, reflecting the increased influence of environmental factors over time (Figure 2).

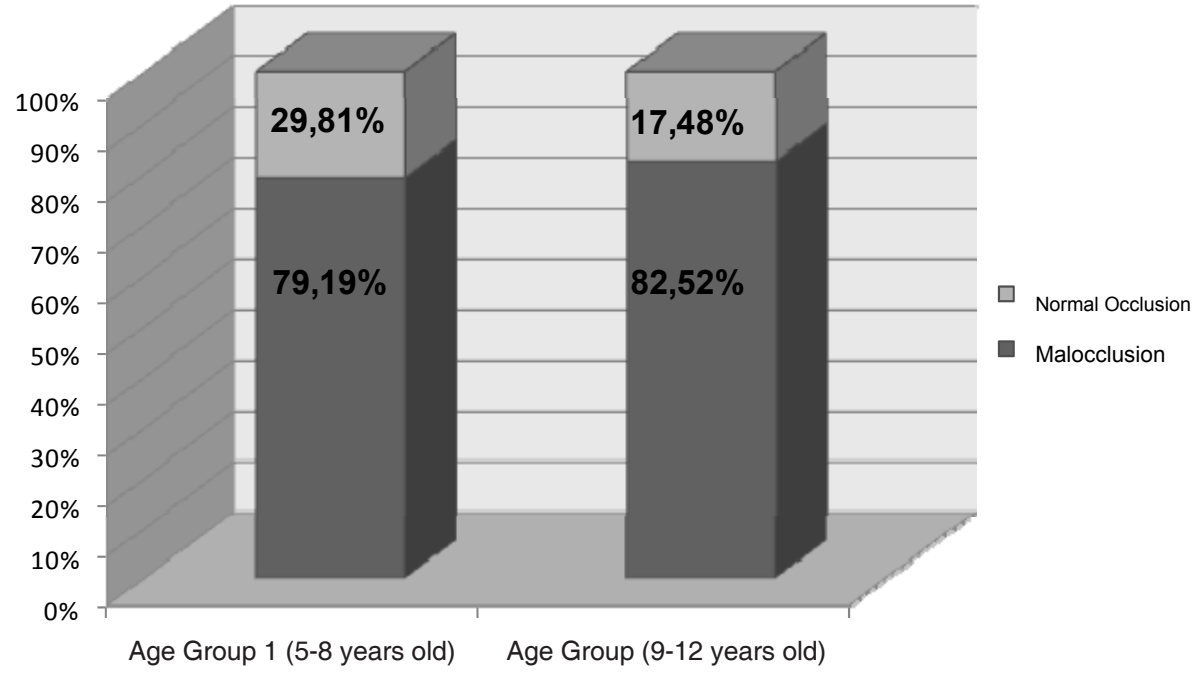

Figure 2 – Percentage of normal occlusion and malocclusion in the sample according to age group

The results in Table 1 show that certain inter-arch occlusal changes, such as open bite and deep bite, differ in their prevalence when the two age groups are compared.

Likewise, when comparing the intra-arch occlusal changes in both age groups, we found that characteristics such as spacing, altered phonation and oral habits show different prevalence according to age (Table 2).

Table 1 – Prevalence of different types of malocclusions (inter-arch relation) in the sample, according to age group

INTER-ARCH RELATION		MALOCCLUSIONS	AGE GROUP (%)		TOTAL (%)
			5-8 years old	9-12 years old	
Sagittal plane	posterior	Molar ratio Class I	60,24	69,47	63,28
		Molar ratio Class II	24,81	27,36	25,66
		Molar ratio Class III	1,33	2,1	1,59
	anterior	Overjet	18,22	25,26	20,54
		Negative overjet (anterior crossbite)	5,45	5,47	5,46
Vertical Plane		Deep bite	24,09	31,78	26,63
		Anterior open bite	30,48	17,26	26,14
		Posterior open bite	0	0,63	0,21
		Anterior/posterior open bite	0,41	0,42	0,41
Transversal Plane		Bilateral posterior crossbite	13,07	12	12,72
		Unilateral posterior crossbite	7,62	11,15	8,78
		Total posterior crossbite	1,64	2,52	1,94

DISCUSSION

Although with great variability, epidemiological studies in the literature[15-19], indicate that most of the children in the mixed dentition stage have some type of morphological occlusion, defined as malocclusions. High rates are expected for this age group, as intense occlusal exchanges and dental changes occur at this stage[20], and the occlusion is highly susceptible to external agents such as harmful habits.

In addition to the high rates of occlusal changes inherent in this age group, several studies[21,22] have shown that the clinical criteria overestimate the normative problems when compared to the perception of individuals.

Regarding measurement criteria of malocclusions, authors such as Maia and Costa Maia (1999)[23] say many data concerning the classification of occlusion, available in the literature, usually do not correspond to clinical reality. This is because of methodological differences in the various studies, the conceptualization of malocclusion, as well as the interpretation of data collected.

Within this context, the present study showed high levels of malocclusion, with an average of 80.29%, partially justified by the rigor applied in the conceptualization of normal occlusal parameters. Clinical examination was used based on the evaluation sheet of dentofacial abnormalities, the instruction manual developed by WHO[24]. In this case, we took into consideration only the presence of abnormalities, but not the severity of them, trying to adapt the needs to the medical records and treatment conditions of the Public Health System of the city.

Figures 1 and 2 show the percentage of malocclusion in the studied population in relation to normal occlusion, demonstrating the seriousness of this problem in the context of Public Health. While high, the results were similar to those found in previous Brazilian studies such as by Silva-Filho et al. (1990)[15], Cavalcanti (2008)[16], Arashiro (2009)[17], Brito (2009)[13], Carvalho (2011)[25], however, lower than those reported in American studies, in which the total frequency of malocclusion vary from 46% to 87%, with an average of 66.6%[26-31]. The racial miscegenation and oral diseases such as caries and early loss, common in the population, may possibly

Table 2 – Prevalence of different types of malocclusions (intra-arcs relation), face types, function and habits present in the sample, according to age group

MALOCCLUSIONS		AGE GROUP (%)		Total (%)
		5-8years old	9-12 years old	
Intra-arcs relation	Diastemas	69,72	53,47	64,38
	Giroversion	67,97	66,1	67,36
	Crowding			
	definitive	18,84	16,42	18,05
	temporary	21,83	21,05	21,58
	Early loss of deciduous teeth	5,04	5,47	5,19
	Deviation from the midline	25,64	45,68	32,22
Facial Analysis	Asymmetry	6,48	8,84	7,26
	Profile Type			
	straight	85,47	81,05	84,02
	concave	1,02	2,52	1,52
	convex	13,49	16,42	14,45
	Facial growth pattern			
	mesofacial	86,19	85,89	86,09
	brachyfacial	8,34	6,73	7,81
	dolichofacial	5,45	7,36	6,08
	Capelozza Classification			
	Standard I	93,82	90,94	92,87
	Standard II	4,22	5,68	4,7
	Standard III	0,3	0,21	0,27
	Short face Standard	0,51	0,84	0,62
	Long face Standard	1,13	2,31	1,52
Function/Habits	Altered phonation	29,55	18,73	26
	Deleterious habits			
	Pacifier	3,7	0,63	2,7
	finger	7,2	4,84	6,43
	bottle	4,53	0,21	3,11
	onychophagia	19,97	38,52	26,07
	associations	7,31	4,42	6,36
	others	0,2	1,47	0,62

have boosted the indices of malocclusion in national studies.

According to the statistical chi-square test, the prevalence of malocclusion showed no statistically significant difference in relation to gender, but there was a significant difference when comparing the two age groups in the sample. According to the results, the age group 2 (nine to 12 years old) showed in general a statistically greater percentage than the age group 1 (five to eight years old) when comparing the prevalence of malocclusion.

A study[32, 33] on prevalence of malocclusion conducted by the public health service from the United States from 1963 to 1970 evaluated clinically about 8000 children and adolescents for diagnosing the presence and severity of malocclusion (index of orthodontic treatment priority – IPT). The results showed an increased frequency and severity of the malocclusion as they get older and some changes, occlusal in particular, such as the irregularity and crowding of the teeth and crossbite. The tendency of increasing in the incisor irregularity with age is an

important factor in the diagnosis, treatment plan and control of patients with this problem.

The Angle classification, seen as key in the diagnosis of malocclusion, presented in the sample, a high incidence of Class I, present in 63.28% of cases of malocclusion, followed by Class II with 25.66%, and in smaller numbers, Class III which was found in 1.59% of cases. In the remaining 9.47% of cases of malocclusion, it was not possible to fit them in the Angle classification because the first permanent molars were not fully erupted. Mostly, the three classes of Angle were more prevalent in the age group 2, when compared to age group one, as the malocclusion index in said group (nine to 12 years old) was significantly higher.

Many studies[26-31] performed among U.S. teenagers show that the frequency of malocclusion of class I varied from 28% to 72% (average 45.8%), the Class II ranged from 6.6% to 29% (average 18%) and frequency of Class III ranged from 1% to 9.4%, with an average of 3%, generally showing inferior values to the obtained in the present study, influenced by a higher percentage of subjects with normal occlusion in these studies.

In contrast, Bishara et al[34] evaluated the changes in molar ratio, from the deciduous dentition to the permanent dentition in 121 subjects, followed for an average period of eight years, from five to 13 years old. The observations of this study indicated that the total group, 61.6% of the cases left molar ratios as Class I, 34.3% as Class II and 4.1% as Class III in the permanent dentition stage. Largely responsible for determining the ratio of anterior-posterior molars is heredity, with an estimated 56%, demonstrating a genetic influence in this case.

Still in the sagittal plane, the change often found in the anterior region was the overjet, found in 20.54% of the sample, while the negative overjet (anterior crossbite) was found in just over 5% of the sample. Unlike the molar ratio of which it is primarily determined by genetics, in the case of the overjet, the weight of heredity is only 23%, indicating that the horizontal overlap is mainly influenced by environmental factors, such as habits, mouth breathing, and posture of the lips among others[35].

In the vertical plane, both the anterior open bite and the deep bite were found in a similar percentage of the sample, involving 26.14% and 26.63% of cases, respectively. In the transverse plane, the bilateral posterior cross bite was the most frequent presenting homogeneous distribution between the two age groups, indicating that this occlusal abnormality in particular, tend not to self-correct or undergo changes as they get older. As to the frequency of open bite and deep bite, it showed a significant difference when comparing the two age groups. While the open bite was more frequent in the age group 1, deep bite was more prevalent in the age group 2.

In the early stages of the mixed dentition, there may be a temporary open bite, usually as a result of the eruption of the incisors or partially because of a mechanical interference due to a persistent habit of non-nutritive sucking. During normal development, the open bite is often of a temporary nature, and will be present until the incisors finalize the process of eruption, unless the abnormal habit persists[20].

Malocclusion resulting from environmental factors such as finger or pacifier sucking can be prevented if the habit is removed before age five, or more accurately, before the beginning of the mixed dentition, as long as the child is experiencing a craniofacial development and normal occlusal. On the other hand, in Standard II or Long Face Standard, the habit will be an etiological factor, superimposed on various factors, including heredity[20].

Harris and Jonhnson (1991)[36] studied the heritability of skeletal and dental variables in a longitudinal study of 30 siblings. The average estimate of 11 occlusal parameters, including interincisal angle, overbite, crowding, incisor irregularity, posterior cross bite and dental rotations was 43% at four year old and 24% at 20 years old. In other words, the occlusal and arch parameters were little influenced by genetic factors and experienced a growing influence of environmental factors throughout the postnatal growth.

The dental abnormalities, besides compromising the intra-arches relationship, can promote changes restricted to the dental arch, as is the case of diastema, giroversions and crowding. The results showed high levels of both diastema (64.38%) and giroversion (67.36%). The crowding, albeit with less high rates, was found in 39.63% of the sample, being 18.05% definitive and 21.58% temporary. According to Cassidy et al (1998)[35], dental rotations do not suffer any influence of heredity. The high frequency of crowded and rotated teeth in modern society is often associated with the soft consistency of the food in urbanized societies[37].

In the case of diastema, the difference in prevalence observed between the two age groups (Table 2), is inherent from the stage of occlusal development. It is expected that children who are in the 1st transitional period or intermediate period of mixed dentition, represented by age group 1 (five to eight years old), have as occlusal characteristics the presence of buccally upper incisors and divergent crowns, increased overjet and generalized diastemas in the anterior region, as the permanent canines have not yet erupted closing or minimizing the inter-dental spacing; also the lip has not yet

exercised action on the incisors, guiding them to a more vertical position. Unless there is a specific indication for closure of the diastema in the early stage of the mixed dentition, it should not be treated to prevent impaction of permanent maxillary canine. The diastema in the early mixed dentition is justified by the proximity of the cusp tips of the canines erupting apices of the lateral incisors. The correction of the convergence of the roots of the incisors with orthodontic appliances can put the roots of the lateral incisors on the path of eruption of canines, being able to cause impaction or resorption of their roots from the side[20].

The third survey of National Health and Nutrition, conducted by Public Health Service from the U.S. from 1988 to 1991[38], showed that the younger children group had a higher prevalence of diastema than the adolescent age group comprising mainly because the younger people did not have all their permanent teeth erupted. There was overjet reduction with age. There was no difference in overbite between genders and age groups. From these data, it was observed that the frequency of close to optimal occlusion decreases from childhood to adolescence, while the frequency of severe malocclusion increases during that transition from growth in the U.S., blacks and whites. More specifically, the irregularity of the incisor increased from childhood to adolescence, while spacing and overjet decreased during growth in the same group. Although with similar results, the present study evaluated the presence of occlusal changes, as previously described in the methodology, not more of the same severity as well as ethnic and racial differences.

According Northway, Wainwright and Demirjian (1984)[39], caries and premature loss of deciduous molars, result in a decrease by approximately 2 to 4 mm per quadrant in arc length. In this research, the early loss showed a low frequency in the sample (5.19%), as well as the presence of facial asymmetry (7.26%). The deviation from the midline, in turn, was present in approximately 32% of the children.

As for the evaluation of the face, the vast majority of the sample had straight profile (84.02%) and Standard I (92.87%). Individuals who have not yet entered the stage of adolescence usually have a mesofacial face, or very near it, and a straight or slightly convex profile, which is very suitable for the age. Standards as long or short face tend to become more evident during the pubertal growth spurt. The morphology of the face and the projection profile are strongly determined by heredity, although environmental factors such as harmful habits may influence unfavorably or not in determining the facial growth pattern[36].

Although the prevalence of harmful oral habits of the sample has been determined only by the declaration of the children involved in the research, without their guardians have been questioned, the rates were quite high. About 45% of children reported having one or more deleterious habits. The most frequent habit was nail biting (26.07%), followed by finger sucking (6.43%) and the combination of two or more habits (6.36%), e.g., finger and pacifier or nail biting and finger sucking. The prevalence of oral habits: finger, pacifier and bottle sucking were higher in the age group 1 when compared to age group 2. In contrast, the nail biting was more prevalent in the 2nd age group, with approximately twice the frequency relative to age group 1. Sucking habits, nutritious or not, tend to be more common in children with low age, as well as changes in the pronunciation of some phonemes, as observed in the first group (age group 1). Over time, the need to suck and emotional attachment reduce, and the child tends to remove these habits spontaneously or under the influence of health professionals, family or classmates. The very low frequency of the habit of pacifier sucking in the study is possibly due to the fact that children feel embarrassed to declare they are carriers of this habit. As in the case of finger sucking or nail biting children end up unwittingly exposing their habits in the social environment in which they live, and so having an easier time declaring their presence.

The Chi-square test found no significant association between malocclusion and the following variables: the presence of habits, asymmetry, facial pattern and the presence of diastema.

When the same statistical test was applied to verify the relationship between different types of occlusal changes or growth patterns, the results showed statistically significant values for the following associations: open bite and crossbite, open bite and Class II, and standard and dolichofacial open bite. These results were expected as the facial pattern associated with environmental factors directly influences the risk of developing certain occlusal changes. Likewise Silva-Filho (1991)[40] reports in his work an index of 30.5% association between open bite and posterior crossbite in children with non-nutritive sucking habits.

With the development of techniques for diagnosis and treatment of malocclusion, orthodontics, in general, tends to move toward the preventive aspects of deciduous and mixed occlusion. Knowing the occlusal problems that affect the population in this age group can be inferred as early as possible, making treatment easier, faster and cheaper. Thus, the prevention programs from the Public Health will become more feasible and effective.

CONCLUSION

The malocclusions affected the most children in the age group studied, having predominantly dental origin and with little or no facial involvement. The results also showed that children were susceptible to numerous environmental factors, among them, the deleterious habits, highlighting the need for early intervention.

ACKNOWLEDGEMENTS

We thank the City Hall and the Department of Health of the city of Araraquara and in particular the Coordination of Oral Health of the city for making possible the realization of this research.

RESUMO

Objetivo: avaliar a prevalência de maloclusões em escolares na faixa etária de cinco a 12 anos, matriculadas em escolas municipais de Araraquara. **Método:** com base no número total de crianças (7235) realizou-se o cálculo da amostragem, envolvendo sete escolas, num total de 3380 crianças. Um estudo piloto e a calibração dos examinadores precederam o início da pesquisa. Foram excluídas 1934 crianças da amostra por não atenderem aos critérios de inclusão. Na avaliação clínica, foram analisados, as relações inter-arcos nos sentidos transversal, vertical e sagital, a relação intra-arcos, o perfil e padrão de crescimento, a presença de assimetria, além de hábitos deletérios. **Resultados:** da amostragem total (1446), 80,29% apresentou maloclusão, sendo mais prevalente no gênero feminino (81,34%) e na faixa etária de nove a 12 anos (82,52%). A relação dentária mais prevalente foi a de Classe I (63,27%), o padrão facial mais encontrado foi o Padrão I (92,87%). As alterações oclusais inter-arcos mais encontradas foram a mordida profunda e a mordida aberta, as alterações intra-arcos predominantes foram os diastemas e as giroversões. De acordo com o Teste Qui-quadrado não houve significância entre maloclusão e as variáveis: presença de hábito, assimetria, diastemas e padrão facial. Houve diferença estatisticamente significante na prevalência das variáveis: mordida aberta, mordida profunda, diastemas e dos hábitos de sucção (dedo, chupeta, mamadeira) e onicofagia quando comparada as duas faixas etárias estudadas. **Conclusão:** as maloclusões acometem a maior parte das crianças nessa faixa etária, tendo origem predominantemente dentária e com pouco ou nenhum comprometimento facial, evidenciando a necessidade da intervenção precoce.

DESCRITORES: Prevalência; Má Oclusão; Criança

REFERENCES

1. Proffit WR. A etiologia dos problemas ortodônticos. In: _____. Ortodontia contemporânea. 3. ed. Rio de Janeiro: Guanabara Koogan, 2002. p. 105-34.

2. Organização Mundial da Saúde. Levantamento epidemiológico básico de saúde bucal: manual de instruções. 3. ed. São Paulo: Ed. Santos, 1991.

3. Albuquerque SSL, Duarte RC, Cavalcanti AL, Beltrão EM. Prevalência de más oclusões em crianças com 12 a 36 meses de idade em João Pessoa, Paraíba. Rev. Dent. Press Ortodon. Ortop. Facial. 2009; 14 (6): 50-7.

4. Carvalho CM, Carvalho LFPC, Forte FDS, Aragão MS, Costa LJ. Prevalência de mordida aberta anterior em crianças de 3 a 5 anos em Cabedelo/PB e relação com hábitos bucais deletérios. Pesq Bras Odontoped Clin Integr. 2009; 9 (2): 205-10.

5. Roncalli AG. A epidemiologia: um olhar coletivo sobre a saúde bucal. In: Ferreira A et al. (Org.). Saúde bucal coletiva: conhecer para atuar. Natal: Ed. da UFRN, 2005. cap. 3, p. 39-62.

6. Furtado ANM, Vedovello-Filho M. A influência do período de aleitamento materno na instalação dos hábitos de sucção não nutritivos e na ocorrência de maloclusão na dentição decídua. RGO. 2007; 55 (4): 335-41.

7. Leite-Cavalcanti A, Medeiros-Bezerra PK, Moura C. Aleitamento natural, aleitamento artificial, hábitos de sucção e maloclusões em pré-escolares brasileiros. Rev. Salud publica. 2007; 9 (2): 194-204.

8. Souza DFRK, Valle MAS, Pacheco MCT. Relação clínica entre hábitos de sucção, má oclusão, aleitamento e grau de informação prévia das mães.

Revista Dental Press Ortodon Ortop Facial. 2006; 11 (6): 81-90.

9. Tanaka O, Kreia TB, Bezerra JGB, Mauro H. A maloclusão e o hábito de sucção de diferentes dados. Jornal Brasileiro de Ortodontia & Ortopedia Facial. 2004; 9 (0): 276-83.

10. Peres KG, Oliveira LMR, Sheiham A, Peres MA, Victora CG, Barros FC. Social and biological early life influences on the prevalence of open bite in Brazilian 6- year- olds. Int J Pediatr Dent. 2007; 17(1): 41-9.

11.Gimenez CMM, Moraes ABA, Bertoz AP, Bertoz FA, Ambrosano GM. Prevalência de más oclusões na primeira infância e sua relação com as formas de aleitamento e hábitos. R Dental Press Ortodont Ortop Facial. 2008; 13(2) 70- 83.

12. Oliveira AB, Souza FP, Chiappetta ALML. Relação entre hábitos de sucção não-nutritiva, tipo de aleitamento e má oclusões em crianças com dentição decídua. Rev CEFAC. 2006; 8(3):352-9.

13. Brito DI, Dias PF, Gleiser R. Prevalência de más oclusões em crianças de 9 a 12 anos de idade da cidade de Nova Friburgo (Rio de Janeiro). R Dental Press Ortodon Ortop Facial. 2009;14(6):118-24.

14. Brasil. Ministério da Saúde. Coordenação Nacional de Saúde Bucal. Condições de saúde bucal da população brasileira. Brasília, DF, 2004 Projeto SB Brasil, 2003.

15. Silva Filho OG, Freitas SF, Cavassan AO. Prevalência de oclusão normal e má oclusão em escolares da cidade de Bauru (São Paulo). Parte I: relação sagital. Rev Odont USP. 1990; 4(2):130-7.

16. Leite-Cavalcanti A, Medeiros-Bezerra PK, Alencar CRB, Moura C. Prevalência de maloclusão em escolares de 6 a 12 anos de idade em Campina Grande, PB, Brasil. Pesq Bras Odontoped Clin Integr. 2008; 8(1):99-104.

17. Arashiro C, Ventura MLS, Mada EY, Uenshi PT, et al. Prevalência de maloclusão em escolares do município de Campinas, São Paulo. RGO. 2009; 57(4):407-11.

18.Castro IO, Valladares-Neto J, Estrela C. Prevalência de maloclusão em indivíduos que solicitaram tratamento ortodôntico na rede pública de saúde. Rev Odontol Bras Central. 2010; 19(51):323-6.

19. Monini AC, Amaral RMP, Gandini MREAS, Gandini Jr LG. Prevalência das más oclusões em crianças na Clínica de Graduação da Faculdade de Odontologia de Araraquara – UNESP. Rev Odontol UNESP. 2010; 39(3):175-8.

20. Bishara SE. Ortodontia. São Paulo: Editora Santos; 2004. 593 p.

21.Peres KG, Traebert ESA, Marcenes W. Diferenças entre autopercepção e critérios normativos na identificação das oclusopatias. Rev Saúde Pública. 2002;36:230-6.

22. Mandall NA, MCCord JF, Blinkhorn AS, Wotthington HV, O'Brien KD. Perceived aesthetis impact of malocclusion and oral self – perceptions in 14-15 – yars old Asian and Caucasian children in greater Manchester. Eur J Orthod. 1999;22:175-83.

23. Maia FA, Costa PAP, Maia NG. Má oclusão em potencial. R Dental Press Orthodon Ortop Facial. 1999;4(1):45-51.

24. World Health Organization. Oral health surveys: basic methods. 4 ed. Geneva: ORH/EPID, 1997.

25. Carvalho DM, Alves JB, Alves MH. Prevalência de maloclusões em escolares de baixo nível socioeconômico. RGO. 2011;59(1): 71-7.

26. Brehm HL, Jackson DL. An Investigation of the Extent of the Need for Orthodontic Services, Amer J Orthodont. 1961;47:148-9.

27. Emrich RE, Brodie AG, Blayney Jr. 1965. Prevalence of Class I, Class II, and Class III malocclusions (Angle) in an urban population: An epidemiological study. J. Dent Res. 1965;44:947-53.

28. Krogman WM. The problem of timing in facial growth, with special reference to the period of the changing dentition. Am J Orthod. 1951;37:253.

29. Mills LF. Epidemiologic studies of occlusion IV the prevalence of malocclusion in a population of 1455 school children. J Dent Res. 1966;45:332-6.

30. Newman GV. Prevalence of malocclusion in children six to fourteen years of age and treatment in preventable cases. J Am Dent Assoc. 1956;52:566-75.

31.Savara BS. Incidence of dental caries, gingivitis and malocclusion in Chicago children (14 to 17 years of age). J Dent Res. 1955;34:546-52.

32. Kelly JE, Shanchez M, Van Kirk LE. An assessment of the occlusion of the teeth of children aged 6-11 years, United States PHS Pub No 74 – 1612, Washington DC. 1973, Us Government Printing Office.

33. Kelly JE, Harvey CR. An assessment of the occlusion of the teeth of youths 12-17 years, United States PHS Pub No 77 – 1644, Washington DC. 1977, Us Government Printing Office.

34. Bishara SE, Peterson L, Bishara EC. Changes in facial dimensions and relationships between the ages of 5 and 25 years. Am J Orthod. 1984;85:238-52.

35. Cassidy KM et al. Genetic influence on dental arch form in in orthodontic patients. Angle Orthod. 1998;68:445-54.

36. Harris EF, Johnson MG. Heritability of craniometric and oclusal variables: a longitudinal sib analysis. Am J Orthod Dentofacial Orthop. 1991;99:258-68.

37. Corruccini RS, Whitley LD. Occlusal variation in a rural Kentucky community. Am J Orthod. 1981;79:250-62.
38. Brunelle JA, Bhat M, Lipton, JA. Prevalence and distribution of selected occlusal characteristics in the US population, 1988-1991. J Dent Res. 1996;75 (Spec Iss):706-13.
39. Northway WM, Wainright RL, Demirjian A. Effects of premature loss of deciduous molars. Angle Orthod. 1984;54:295-329.
40. Silva Filho OG, Gonçalves RMG, Maia FA. Sucking habits: Clinical management in dentistry. The J Clin Pediat Dent. 1991;15(3):137-56.

Received on: November 25, 2011
Accepted on: January 25, 2012

Mailing Address:
Karina Eiras Dela Coleta Pizzol
Av. Cristovão Colombo, 614
Araraquara – SP
CEP: 14801-200
E-mail: nkpizzol@ig.com.br