Interrelation between orthodontics and phonoaudiology in the clinical decision-making of individuals with mouth breathing

Rúbia Vezaro Vanz[1], Lilian Rigo[2], Angela Vezaro Vanz[3], Anamaria Estacia[4], Lincoln Issamu Nojima[5]

Objective: The purpose of this study was to investigate the decision making of orthodontists of Passo Fundo district - Rio Grande do Sul (RS, Brazil), in the Orthodontics/Speech Therapy interdisciplinary treatment of mouth breathing individuals.

Methods: The present study is a quantitative approach and the design is descriptive, using as instrument data collection of a questionnaire sent to 22 orthodontists practicing in the above-mentioned district. The project was approved the the Ethics in Research Committee and all individuals signed a free informed consent.

Results: All professionals considered the inter-relation between Orthodontics and Speech Therapy necessary, but divergences were found in situations where a associated therapy may exist, considering that 54.5% trust the inter-relation to develop aspects associated to language, orofacial motricity and habits. In cases of associated treatment, the results obtained were considered satisfactory by 73.7% of professionals, even though they consider that only 6 to 20% of their patients collaborate with treatment.

Conclusion: In relation to decision-making in treatment of mouth breathing individuals, the orthodontists in Passo Fundo/RS agree that there is need for speech therapy. The full vision of the individual in a multidisciplinary team is of fundamental importance in the treatment of patients with mouth breathing syndrome.

Keywords: Mouth breathing. Orthodontics. Speech therapy.

[1] Specialist in Orthodontics – Ingá/Uningá.

[2] Head of the Dental School, Meridional University (IMED) and Professor of the graduate course CEOM/IMED.

[3] Specialist in Endodontics – Ingá/Uningá.

[4] Head of the graduate course in Orthodontics, CEOM/IMED and Professor of the Dental School, Meridional University (IMED).

[5] Associate Professor of Orthodontics, Federal University of Rio de Janeiro. Visiting Associate Professor, Department of Orthodontics, Case Western Reserve University, Post-doctorate traineeship.

How to cite this article: Vanz RV, Rigo L, Vanz AV, Estacia A, Nojima LI. Interrelation between orthodontics and phonoaudiology in the clinical decision-making of individuals with mouth breathing. Dental Press J Orthod. 2012 May-June;17(3):29.e1-7.

Submitted: April 29, 2009 - **Revised and accepted**: April 12, 2010

» The authors report no commercial, proprietary or financial interest in the products or companies described in this article.

Contact address: Lilian Rigo
Av. Major João Schell, 1121
Zip code: 99.020-020 – Passo Fundo/RS, Brazil
E-mail: lilianrigo@via-rs.net

© 2012 Dental Press Journal of Orthodontics

INTRODUCTION

Chronic mouth breathing is the set of signs and symptoms of those who breathe fully or partially through their mouth.[1,2,3,4] The individual replaces the correct pattern of nasal breathing by an inadequate standard.[5]

Mouth breathing is characterized by a deviation in the nasal breathing, being a disorder that affects growth and development of the whole orofacial system. This study highlights the close relationship between bone and dental condition, muscles, and functions of the stomatognathic system.[6] When continued, triggers a chain of events that affect child development and even adults in their everyday activities.[7]

Currently, it is known that treatment of chronic mouth breathing requires an interdisciplinary approach, since it is impossible, with just one professional, to recover functional, pathologic, structural, postural and emotional needs of patients with this syndrome.[8] Teamwork is therefore of fundamental importance, because through an integrated assessment a special treatment will be proposed for the resolution of each case successfully.[9] To do this, understanding the factors that produce the characteristic changes of mouth breathing is essential, and this situation goes beyond the mere detection of these changes.[10]

The dentist is directly involved in the rehabilitation of the mouth breathers, seeking a greater integration with other professionals such as speech therapist, otolaryngologists, physical therapists, psychologists and nutritionists in order to achieve balance between form and function.

The orthodontic intervention aims to modify the oral structure allowing an improvement in breathing through fixed or removable appliances, correcting the bone structure, and not merely the teeth. The speech therapy intervenes in the reeducation of breathing associated with a myotherapy with strengthening exercises, adjusting the amended muscle by mouth breathing.[9]

Despite the large number of different approaches and studies described in the literature for over a century about the effects and treatment of mouth breathing, there are few allusions to interdisciplinary performances that can be of great value, both during treatment and post-treatment of this syndrome. Thus, this study aims to show the importance of multidisciplinary work in the treatment of patients with chronic mouth breathing, which will contribute to better care and consequently for the success of dental treatment.

The objective of this study is to verify the clinical decision-making for treatment by orthodontists of Passo Fundo (RS, Brazil) in the interrelationship with the speech therapy in mouth breathers.

METHODS

The study is a quantitative evaluation, whose design is descriptive and exploratory. It was conducted from July 2008 in Passo Fundo, which is located in the northern region of Rio Grande do Sul, with a population of 185,279 inhabitants. The climate is temperate with temperatures ranging between 3º C to 36º C, altitude of 687 m, total area of 780 kilometers, and a population density of 219.05 inhabitants / km^2.[11]

Initially, the sample consisted of 28 orthodontists from Passo Fundo, registered in the Regional Dental Council. Of the total number of professionals, five did not agree to participate, and one of them is an author of the present study. Thus, 22 orthodontists composed the final sample.

The research project was referred to the Ethics Committee in Research of Ingá/ Uningá Maringá, having been approved according to Resolution 196/96 of the National Opinion under number 0083/08. The professionals involved in the study signed a consent form accepting to participate in the work, and absolute confidentiality was guaranteed regarding the data reported by them.

The survey instrument applied to 22 orthodontists was a questionnaire with open and closed questions, and, in the first half were the demographic data (gender, age, year of graduation, dental school, type of graduate programs in Orthodontics and professional activities). The second part consisted of questions concerning the interrelationship between Orthodontics and speech therapy, ie, the data referred to the criteria regarding clinical decision-making for treatment of orthodontists.

The data collected in the sample were logged in the Excel database and exported to the statistical software - SPSS 15.0 for descriptive analysis.

© 2012 Dental Press Journal of Orthodontics

RESULTS

Descriptive analysis

After applying the questionnaire to 22 orthodontists, we obtained the absolute and relative results. Most professionals, 72.7% were female with an average of 42 years old (28 to 62 years). The mean number of years after graduation was 19 years (5 to 38 years). Most professionals completed the undergraduate program in private school (90.2%): 86.4% of orthodontic specialists, working in a private practice (90.2%). Data for the profile of the professionals are described in Table 1.

Descriptive analysis on decision-making

Regarding the importance of the interrelationship between orthodontics and speech therapy, all 22 professionals (100%) agreed that this relationship is needed. There were disagreements related to situations where there is a need / possibility of a interdisciplinary treatment, and many (54.5%) rely on teamwork to develop aspects related to language, orofacial motricity, and habits, while others (31.8%) believe the interrelationship only to treat disorders related orofacial motricity and habits, and some (13.6%) use it only to interdisciplinary problems related to habits. However, 86.3% refer their patients to the speech therapist (Table 2). Thus, in the following issues for decision-making of these professionals has been defined to exclude those who do not refer to the speech therapist and maintain a sample of 19 orthodontists.

Sample of 19 professionals, 36.8% refer up to 5% of patients for speech therapy, 26.3% refer 6 to 10%, 21.1% route from 11 to 20%, 10.5% refer 21 to 30% of patients and only 5.3% refer more than 30%. The resistance of the patients to undergo speech therapy, according to professionals, is 73.7%, and the results are satisfactory in 73.7% of cases. The percentage of patients who cooperate with the interdisciplinary treatment, as assessed by professionals, was quite varied. With regard to maintaining contact with the speech therapist, upon the realization of referrals, 84.2% of these orthodontists seek contact with the speech therapist. Another issue proposed was to determine whether orthodontists await the end of speech therapy to orthodontic discharge, and it was found 57.9% of orthodontist always wait. With respect to treatment

Table 1 - Description of dentists in the city of Passo Fundo/RS (Brazil), 2009, according to demographic characteristics.

Demographic variables	n	%
Gender		
Male	6	27.3
Female	16	72.7
TOTAL	22	100.0
Age		
25 to 35 years	7	31.8
36 to 45 years	6	27.3
Over 45 years	9	40.9
TOTAL	22	100.0
Time after graduation		
5 to 10 years	6	27.2
11 to 20 years	8	36.4
Over 20 years	8	36.4
TOTAL	22	100.0
Undergraduate program		
Private school	20	90.2
Public school	2	9.8
TOTAL	22	100.0
Training after graduation		
Post-graduation	19	86.4
Master's degree	3	13.6
TOTAL	22	100.0
Professional practice		
Private	20	90.2
Private and Public	2	9.8
TOTAL	22	100.0

Table 2 - Treatment decision-making regarding the interrelationship with the speech therapist by dentists in the city of Passo Fundo (RS, Brazil), 2009 (n=22).

Decision-making variables		
Interrelation with speech therapist		
Yes	22	100.0
No	0	0
TOTAL	22	100.0
Interdisciplinary treatment		
Speech therapy, orofacial motricity disorders and habits	12	54.5
Orofacial motricity disorders and habits	7	31.8
Habits	3	13.6
TOTAL	22	100.0
Refer patient to speech therapist		
Yes	19	86.3
No	3	13.7
TOTAL	22	100.0

Table 3 - Treatment decision-making regarding the interrelationship with the speech therapist by dentists in the city of Passo Fundo (RS, Brazil), 2009 (n=19).

TREATMENT DECISION VARIABLES	n	%
Patients referred to speech therapy		
5%	7	36.8
6 to 10%	5	26.3
11 to 20%	4	21.1
21 to 30%	2	10.5
Over 30%	1	5.3
TOTAL	19	100.0
Patient resistance		
Resistance	14	73.7
Without resistance	5	26.3
TOTAL	19	100.0
Results of the interrelation with speech therapist		
Satisfactory outcome	14	73.7
Unsatisfactory outcome	5	26.3
TOTAL	19	100.0
Patient who cooperate with the interdisciplinary treatment		
5%	1	5.2
6 to 10%	5	26.3
11 to 20%	5	26.3
21 to 30%	4	21.1
Over 30%	4	21.1
TOTAL	19	100.0
Maintain contact with the speech therapist		
Yes	16	84.2
No	3	15.8
TOTAL	19	100.0
Orthodontics end only after the speech therapy discharge		
Yes	11	57.9
No	2	10.5
In some cases	6	31.6
TOTAL	19	100.0
Relapse without interdisciplinary treatment		
In some cases	18	94.7
100% of cases	1	5.3
TOTAL	19	100.0
Relapse with interdisciplinary treatment		
In some cases	17	89.5
100% of cases	2	10.5
TOTAL	19	100.0

relapse where there was no interdisciplinary work, 94.7% of the respondents attributed this relapse to the lack of speech therapy only in some cases and not in 100%. Also with regard to relapses, now in cases where both treatments were performed, 89.5% credit the relapses to the lack of speech therapy follow-up, but only in some cases. Data for decision-making variables are shown in Table 3.

DISCUSSION

Studies related to the occurrence of mouth breathing show a high prevalence of this syndrome. A study conducted in Recife in a sample of 150 children aged 8 to 10 years old found a prevalence of 53.3% of mouth breathers, with no statistically significant differences between gender and age.[12] Another study, conducted with questionnaires sent to 496 parents or guardians in Londrina (PR, Brazil) identified a prevalence of 56.8% of mouth breathers, with no gender influence with respect to gender.[13] In Santa Maria, 219 children were evaluated, of whom 121 were suffering from mouth breathing, and of these 100% had some type of malocclusion. The authors noted that 18.2% of mouth breathing children showed abnormalities during speech articulation, and most of them had Angle Class II malocclusion.[14] In Minas Gerais, the prevalence of mouth breathing children between 3 to 9 years was 55% of the sample, however, no association between gender, socioeconomic status or age was found.[13]

Based on the data of this syndrome, this study sought to determine how the professionals make their treatment decisions. In this research, regarding the profile of the sample, most orthodontists were female, mean age of 42 years. The average length of training of these professionals was 19 years, and most concluded the undergraduate courses in private colleges. Of these, most are specialists and only work in private practice. From the data, one can assume that the professionals surveyed have experience in the area and are aware of the problem studied in order to make health decisions. All professionals of the sample agreed on the importance of the interrelationship between Orthodontics and Speech Therapy for the treatment of individuals, especially in patients with mouth breathing. With the constant evolution and the speed of knowledge

dissemination, the effectiveness of treatment relies heavily on teamwork. For years, the need to work together is described, and this fact may be related to the awareness of professionals regarding the limitations and possibilities of their specialties, therefore, there is a need to seek help in others, for better resolution of cases. The orofacial motricity is the area of speech therapy related to study, research, prevention, assessment, diagnosis, development, habilitation, rehabilitation and improvement of structural and functional aspects of orofacial and cervical regions.[15] The development of bone and muscle has a close relationship, and it is important to consider the molding action of the muscles on the dental arches, when balanced and harmonious, favoring a normal occlusion. However, any deviations can produce functional changes and bone deformities.[16] It has been recognized that occlusion modulates the functions, but also not enough to reposition the bone bases and / or adjust the occlusion without developing or restoring the function for that "new system", i.e. if the functional and muscle disorders that may adversely affect the stomatognathic system are not removed.[6] Working as a team is important in the dysfunctions of the stomatognathic system, especially in mouth breathing, which treatment involves the monitoring of the orthodontists in craniofacial development and correction of malocclusion and speech rehabilitation in multiple functions through myofunctional therapy.[15] In the literature, it is possible to find several studies emphasizing the importance of working together, which should include professionals from different areas that are integrated in order to benefit by improving the quality of life of patients, who is the most important element of this process.[17] In this research, we can also see that most professionals rely on teamwork to develop aspects related to language, orofacial motricity and habits.

As for the results of this survey, comparing the experience of the interdisciplinary treatment of mouth breathing between orthodontics and speech therapy, a large percentage of professionals (73.7%) were satisfied with treatment results. Successful treatment of patients with "myofunctional disorders of the face" is related to the work of an interdisciplinary team specialized and integrated. Studies and surveys conclude there is a close relationship between the dentoalveolar morphological changes and functional alterations of the stomatognathic system, considering that these functional changes are not only treated with the correction of dental arch morphology. This means that, when it is present, the functional changes should be addressed by specific therapeutic procedures, after orthodontic treatment. It appears, therefore, the importance of interdisciplinary work, as a consequence of clear and close relationship between the morphological and neuromuscular adaptation condition, citing the involvement of speech therapy as an adjunct of orthodontics in obtaining the stability after treatment. The speech therapist, working with orthodontics, enhances the process of correcting malocclusion, by improving the periorbicular muscle tone.[18]

However, in this research, with respect to the patient compliance in the inter-relationship between the areas, practitioners have found a very small percentage of subjects who understand the need for an interdisciplinary treatment for better results, observing therefore a great resistance from patients. A study conducted in Campo Grande (MS, Brazil) used three separate questionnaires, but interrelated, with the purpose of evaluating the interdisciplinary relationship, and considered the results depend on patient cooperation, giving satisfactory results to the awareness and cooperation of the patient, who should perform the exercises at home by the professional. There are case reports of frustration with interdisciplinary work, rightly attributing the failure to the difficulty of the professionals with regard to motivation and involvement of patients and relatives.[15] Another study conducted in Vitória (ES, Brazil) with 100 professionals in various areas of health also cited, as a failure factor, the resistance of patients and families in promoting changes in habits.[19]

On criteria related to patient discharge, a study by Amaral[15] found that 38.8% of orthodontists await speech therapy discharge to end orthodontics. This fact is in accordance with the present study, which obtained 57.9% of professionals who are awaiting speech therapy discharge in some cases and 31.6% who are awaiting discharge from speech therapy in all cases. It is assumed that the orthodontic correction can only be maintained when properly aligned with the balance of the patients muscles. So, it seems

a consensus that the orthodontist must wait the end speech therapy for the discharge of orthodontic treatment, since the long-term stability after orthodontic treatment is obtained after the restoration of muscle balance.

In this study, with respect to treatment relapse, where there was no interdisciplinary work, professionals have attributed this relapse to the lack of speech therapy approach or lack of treatment together. Another cause of relapse was justified by the lack of speech therapy after discharge. A study evaluated the relapse rate of atypical swallowing after 3 years follow-up, comparing children undergoing myofunctional and mechanical therapy, and others submitted only to mechanical therapy, concluding that the combination of both therapies favored conditions for change swallowing and resting position.[6] There is agreement in the literature that the interdisciplinary approach leads to better control and resolution of cases in treatment, reducing the risk of relapse.[10]

For the foregoing and the limitations of this study, in the case of a descriptive study with a small sample of a municipality considers the findings of real importance for the need for an integrated work between orthodontics and speech therapy, especially in the treatment of individuals with mouth breathing in order to achieve standardization and functional morphology.

CONCLUSION

According to the methodology used and the results obtained, it can be concluded that:

- In relation to clinical decision-making of treatment in patients with mouth breathing, the orthodontists in Passo Fundo-RS belonging to the sample agreed that there was a need of relationships with speech therapists, therefore, agreed that treatment should be developed in conjunction for the problems related to language, orofacial motricity and habits.
- Orthodontists in this city make the decision to refer their patients to speech therapy, and follow their treatment, but most feel patient's resistance to perform the speech therapy.
- The complete view of the individual in the multidisciplinary team has a fundamental importance in the treatment of patients with chronic mouth breathing.

© 2012 Dental Press Journal of Orthodontics

REFERENCES

1. Proffit WR, Fields Junior HW. Ortodontia contemporânea. 3a ed. Rio de Janeiro (RJ): Guanabara Koogan; 2002.
2. Santos-Pinto A, Paulin RF, Melo ACM, Martins LP. A influência da redução do espaço nasofaringeano na morfologia facial de pré-adolescentes. Rev Dent Press Ortodon Ortop Facial. 2004 Maio-Jun;9(3):19-26.
3. Lessa FCR, Enoki C, Feres, MFN, Valera FCP, Lima WTA, Influência do padrão respiratório na morfologia craniofacial. Rev Bras Otorrinolaringol. 2005 Mar-Abr;71(2):156-60.
4. Rodrigues M, Barros RL, Luna TF, Silva HJ. Avaliação quantitativa da função tubária e síndrome do respirador oral: um estudo de caso. J Bras Fonoaud. 2003 Out-Dez; 4:269-71.
5. Oliveira TC. Síndrome do respirador bucal: análise fisiopatológica e uma abordagem fisioterapêutica. Lato & Sensu. 2001 Dez;2(4):5.
6. Pereira CC, Felício CM. Os distúrbios miofuncionais orofaciais na literatura odontológica: revisão crítica. Rev Dent Press Ortodon Ortop Facial. 2005;Jul-Ago;10(4):134-42.
7. Paranhos LR, Cruvinel MOB. Respiração bucal: alternativas técnicas em ortodontia e ortopedia facial no auxílio ao tratamento. J Bras Ortodon Ortop Facial. 2003 Maio-Jun;8(45):253-59.
8. Saffer M, Rasia Filho AA, Lubianca Neto JF. Efeitos sistêmicos da obstrução nasal e da respiração oral persistente na criança. Rev AMRIGS. 1995 Jul-Set;39(3):179-82.
9. Santos HL, Santos HL, Santos RP. A importância da visão multidisciplinar no diagnóstico e tratamento de indivíduos com a síndrome do respirador bucal. Rev. ABO Nac. 2008;16(4):230-2.
10. Felício CM. Fonoaudiologia aplicada a casos odontológicos: Motricidade oral e audiologia. São Paulo (SP): Pancast; 1999.
11. IBGE. Censo Demográfico, 2000 [internet]. [cited 2006 Nov 17]. Available from: http://www.ibge.gov.br.
12. Menezes VA, Leal RB, Pessoa RS, Pontes RMS. Prevalência e fatores associados à respiração oral em escolares participantes do projeto Santo Amaro-Recife, 2005. Rev Bras Otorrinolaringol. 2006; Maio-Jun;72(3):394-9.
13. Abreu RR, Rocha RL, Lamounier JA, Guerra AFM. Prevalência de crianças respiradoras orais. J Pediatria. 2008; 84(5): 467-70.
14. Felcar JM, Bueno IR, Massan ACS, Torezan RP, Cardoso JR. Prevalência de respiradores bucais em crianças de idade escolar. Ciênc Saúde Colet. 2010; 15(2):437-44.
15. Amaral EC. Inter-relação entre a odontologia e a fonoaudiologia na motricidade orofacial. Rev CEFAC. 2006 Jul-Set;8(3):337-51.
16. Andrade HS, Garcia RS. Inter-relação ortodontia - fonação. Rev Odonto Ciênc. 2001 Maio-Ago;16(33):125-219.
17. Mendes ACS, Costa AA, Nemr K. O papel da fonoaudiologia na ortodontia e na odontopediatria: avaliação do conhecimento dos odontólogos especialistas. Rev CEFAC. 2005 Jan-Mar;7(1):60-7.
18. Associação Paulista de Cirurgiões-Dentistas (APCD). Escola de Aperfeiçoamento Profissional. A Inter-relação entre Fonoaudiologia e Ortodontia [internet]. [cited 2008 Out 20]. Available from: http://www.apcdsaocarlos.org.br/eap/anais_prata/t2.doc.
19. Sipolatti KC, Dadalto ECV. Síndrome do respirador bucal: a experiência clínica de profissionais de saúde de Vitória-ES. UFES Rev Odontol. 2003 Maio-Ago;5(2):32-8.

© 2012 Dental Press Journal of Orthodontics