



TITLE: Evaluation of correlation between Habits and Dyslalias

AUTHORS: Dr. Deepak Prabhu¹, Dr AKR Santhosh Priya²

1. Senior lecturer, Department of Orthodontics, Tagore Dental College and Hospital

2. Senior lecturer, Department of Pedodontics, Sathyabama Dental College and Hospital

Submitted: 01-03-2022

Revised: 10-03-2022

Accepted: 12-03-2022

ABSTRACT

Aim-

The aim of the present study is to evaluate the correlation between habits and dyslalias in school going children between age of 8-13 years.

Materials and Methods-

A group of 500 children, between age group of 8-13 years were included in this study of which 229 were boys and 271 were girls from schools in south Chennai. Presence of habits, dental and soft tissue changes were noted. Speech sounds were evaluated using charts presenting with pictures (combining consonants and vowels in english language). Sounds evaluated are sibilants, linguoalveolar stops, labiodental fricatives, linguodental fricatives.

Results-

Out of the 500 participants evaluated 159 children met the inclusion criteria. Out of which 34 children had habits associated with speech difficulty. (phonemes /s// z// th// sh/).

Conclusion-

Not habits caused dyslalias. Early identification of dyslalias and its association with any underlying habits is important to aid in correction of habit and speech improvement.

KEYWORDS: Habits, Malocclusion, Dyslalias,

[abnormal growth and development or may be due to different etiological factors. The concept of dyslalialia corresponds to a disorder in the articulation of phonemes, either by altering or omitting some specific sounds or by replacing sounds incorrectly[3]. It is an inability to properly pronounce or form certain phonemes or groups of phonemes. Based on its causes, dyslalialias may be classified as evolutionary, functional, audiogenic, and organic.

Functional dyslalialias may be classified as Substitution dyslalialias, which define an error in speech articulation where a sound is replaced by another; Omission dyslalialias occur when the proper articulation of the phoneme is unknown and is not replaced by another phoneme; Insertion dyslalialias refer to the replacement of a sound by another sound that does not correspond to the specific word; Distortion dyslalialias occur when a phoneme is articulated incorrectly but is not replaced by a specific phoneme, or the articulation is similar, not exact, to the correct form. This is usually the result of a defective position of the articulation organs.

The oral function is mainly carried out by the tongue and its movements, the shape of the palate and the dental arches, the teeth and the lips, and the movements of the jaw, under the directives of the ATM (Temporomandibular articulation) and the skeletal muscles, which cause the alteration of the phonemes, modifying the spatial trajectories during the functions. Concerning occlusal problems, it emerges that a big overjet can play a role in predisposing to dyslalialia. The identification of dyslalialia is based on the auditory and visual analysis of tongue movements. Children with an overjet > 4mm have a greater prevalence of speech diseases than children without it (p = 0.0117), and with a unilateral crossbite[4]. Frequently there are distortions of the phonemes /s/ e /z/. It has also been demonstrated the association between the presence of an anterior open bite (AOB) or head-to-head bite and the phonemic /s/z/t/d/l/ alteration of pronunciation. The AOB is the more common malocclusion in patients with dyslalialia, because it

I. INTRODUCTION

The literature says that malocclusion may affect oral functions[1]. This is particularly true for malocclusions and speech difficulties (dyslalialias). In presence of certain malocclusions, it can be difficult or impossible to produce certain words (sounds), this may require effective speech therapy and preliminary orthodontic treatment for correction of speech difficulties. Several studies report that occlusal alterations may cause alterations in the production of alveolar fricative consonants, in normal morphological and/or functional conditions[2].

Dyslalialias is a change that occurs during the emission of certain vowels and consonant sounds, which is caused by alterations in fonoarticulatory organs (lips, palate, cheeks, tongue, and respiratory organs). This can be due to



causes the alteration of the emission of phonemes[5,6,7].

Apart from skeletal changes, the presence of abnormal oral habits is also related to underlying malocclusions which can be correlated with dyslalias. Longstanding habits cause both dental and skeletal alteration which also leads to improper tongue positioning. The common habits associated with dyslalias are sucking habits (fingers, lips, pacifiers, etc), mouth breathing, altered tongue position (tongue thrusting)[8].

This article aims evaluation of correlation of habits and dyslalias in school children between 8-13 years.

II. MATERIALS AND METHODS

A Group of 500 children, aged 8-13 years, 229 boys and 271 girls were included in the study conducted in the various schools in South Chennai.

The inclusion criteria were the following:

1. Growing patients with habits
2. No evidence of significant hearing loss;
3. Adequate cooperation;
4. No history of orthodontic treatment.

The exclusion criteria were:

1. History of hearing loss;
2. Previous orthodontic treatment;
3. Informed consent not granted;

4. Nasal or laryngeal disorder;
5. Congenital anomalies.

Presence of habits like thumb sucking, tongue thrusting, mouth breathing, nail-biting were noted. Dental and soft tissue changes due to habits like anterior open bite, anterior protrusion, improper tongue positioning, lip incompetency was noted.

Speech sounds were evaluated by a chart containing pictures that refer to words combining all consonants and vowels in the English language. The child is asked to name the pictures or repeat their name. The examiner enters the answers on the prescribed form.

Speech sounds evaluated are sibilants, linguoalveolar stops, labiodental fricatives, and linguodental fricatives(table1)[9].

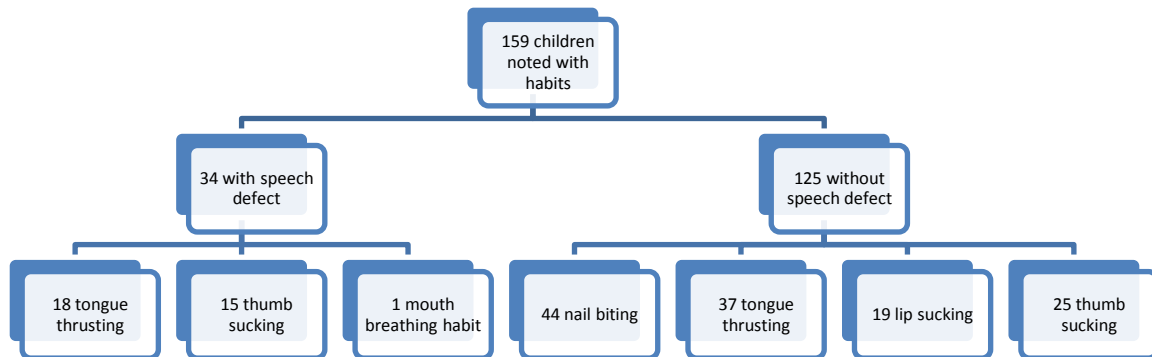
Evaluation: notes on the evaluation form refer to the method of articulating phonemes, whether their pronunciation was correct, or they were substituted, omitted, distorted or if misarticulation occurred (at the beginning or middle of a word, in a consonantal group). It is necessary to highlight whether the data refer to spontaneous articulation or to word repetition. This is a very quick test; however, the analysis of the responses must go more into detail to provide a more complete overview of the patient's articulating process.

Table 1: Speech difficulties related to malocclusion

Speech sound	Problem	Related malocclusion
/s/, /z/ (sibilants)	Lisp	Anterior open bite, large gap between incisors
/t/, /d/ (linguoalveolar stops)	Difficulty in production	Irregular incisors, especially lingual position of maxillary incisor
/t/, /v/ (labiodental fricatives)	Distortion	Skeletal class III
Th, sh, ch (linguodental fricatives)	Distortion	Anterior openbite

III. RESULTS:

500 hundred patients were considered and 159 children met the inclusion criteria.



34 subjects with oral habits were associated with speech defect.

On evaluation of articulation, speech difficulties were associated with the phonemes /s/ /z/ /th/ /sh/. Common functional dyslalias associated with habits was Distortion.

IV. DISCUSSION:

In this present study presence of speech difficulty associated with habits was evaluated in 500 children in which 34 children with habits presented speech difficulty.

DORLAND(1957) defined habit as a fixed or constant practice established by frequent repetition. Oral habits could be partitioned into 2 primary gatherings: Procured oral habits: Incorporate those practices which are learned and could be halted effectively and when the youngster grows up, the person can surrender that conduct and start another (Finn, 1998) Impulsive oral habits: Comprise of those practices which are fixed in kid and when passionate pressing factors are excruciating for the kid, the individual in question can feel security with this propensity, and keeping the kid from these habits make the person in question restless and stressed.

Oral habits, if persist beyond certain developmental age, can cause great harm to the developing teeth, occlusion, and surrounding oral tissues. The habits are typical up to 2-4 years old. It turns into developmental abnormality when proceeded for longer time and most commonly seen

in mixed dentition stage. This is the main sign for child to show future malocclusion or inconsistency during mixed dentition

These habits might be non-nutritive sucking (thumb, finger, pacifier and/or tongue), lip biting and bruxism events. Non-nutritive habits have been identified to be associated etiological factors, among which the habits of lingual thrust and atypical swallowing are interrelated. These habits are the major risk factors for anterior open bite in mixed dentition which can result in damage to dento-alveolar structure like anterior tooth protrusion, lip incompetency leading to speech difficulties hence, causes and its management plan is important to every clinician.

Speech sound seems more sensitive to alterations of oral structures than other causes. This may relate to the order of difficulty of individual sound production, since the sounds acquired last are those most often reported as distorted. The ability to adapt and compensate appears to play a significant role[10].

Normal structure +normal function = normal speech

Abnormal structure + adaptive function = normal speech

Abnormal structure + no adaptive function = abnormal speech

Normal structure + abnormal function = abnormal speech



Hence, children presenting with habits having good adaptive function do not present with speech difficulty. This outcome is seen in this present study where 125 children with habits presented with normal speech.

In our present study, the position of the tongue was significantly altered with lingual thrust, accompanied by distortion during speech in most patients with thumb sucking and tongue thrusting. This result was similar to study conducted by Pomerantz and Zeller [11] who concluded that openbite or edge to edge occlusion was significantly related to defective speech sounds in particular /s, z/, /th/ and /l/ and Bernstein [12] who examined 437 school children with speech problem and concluded that speech is not related to malocclusion generally except in openbites, where there is a strong relationship with lisping. Another study done by Rathbone et al [7] shows speech improvement following orthodontic corrections.

Speech is a progressive phenomenon which is generally completed by about 8 years of age. Understanding of speech development helps in reducing misinterruptions of speech sound difficulty identified at an early age (table 2). When speech sounds are not developed beyond 8 years of age dental malocclusion could be one of the reason. Therefore, it is important for a dentist to evaluate speech at right time and provide appropriate dental treatment for required patient. Hence improvement in speech can be predicted with improved structural factors and any residual errors can be reduced or eliminated by the process of learning with the speech therapist mostly after orthodontic treatment[7].

Therefore, the dentists responsibility to dyslalias is to identify defective sound and to correlate the dental structure in relative to the production and articulation of speech sounds. Secondly pedodontists and orthodontists are responsible to correct the dental structure in normal functioning position to improve the child speech.

Age (in years)	Consonants
3	p, m, n, ng, f, h, w
3.5	B
4	d, g, k, r
5	t, s, sh, ch, l, v
6	th(unvoiced), z
7	th (voiced), s and r blends (sm, gr and so forth)

V. CONCLUSION:

Not all children with habits present with dyslalias. Children who are having dyslalias associated with habits early assessment and intervention is required to aid in correction of habit which also improves speech.

REFERENCES

- [1]. Ovsenik M, Farčnik FM, Korpar M, Verdenik I. Follow-up study of functional and morphological malocclusion trait changes from 3 to 12 years of age. *The European Journal of Orthodontics*. 2007 Oct 1;29(5):523-9.
- [2]. Johnson NC, Sandy JR. Tooth position and speech—is there a relationship?. *The Angle Orthodontist*. 1999 Aug;69(4):306-10.
- [3]. Ocampo-Parra A, Escobar-Toro B, Sierra-Alzate V, Rueda ZV, Lema MC. Prevalence of dyslalias in 8- to 16-year-old students with anterior open bite in the municipality of Envigado, Colombia. *BMC oral health*. 2015 Dec;15(1):1-6.
- [4]. Toni B, Horodyski M, Lesti M, Fusco R, Favale M. Correlations between dyslalias and orthodontics. *WebmedCentral ORTHODONTICS* 2017;8(11):WMC005382
- [5]. Deng MZ, Leotta DF, Huang GJ, Zhao ZH, Liu ZJ. Craniofacial, Tongue, and Speech Characteristics in Anterior Open Bite Patients of East African Ethnicity. *Res Rep Oral Maxillofac Surg*. 2019;3(1):1-3.
- [6]. Botero-Mariaca P, Sierra-Alzate V, Rueda ZV, Gonzalez D. Lingual function in children with anterior open bite: A case-control study. *International orthodontics*. 2018 Dec 1;16(4):733-43.
- [7]. Rathbone JS, Snidecor JC. Appraisal of speech defects in dental anomalies with reference to speech improvement. *The Angle Orthodontist*. 1959 Jan;29(1):54-9.
- [8]. Farronato G, Giannini L, Riva R, Galbiati G, Maspero C. Correlations between malocclusions and dyslalias. *European journal of paediatric dentistry*. 2012 Mar 1;13(1):13-8.



- [9]. Proffit WR, Fields Jr HW, Sarver DM. Contemporary orthodontics. Elsevier Health Sciences; 2006 Dec 8.
- [10]. Bloomer HH. Speech defects associated with dental malocclusions and related abnormalities. Handbook of speech pathology and audiology. 1971.
- [11]. Pomerantz J, Zeller AJ. SPEECH OCCLUSION AND TONGUE FUNCTION IN ELEMENTARY SCHOOL CHILDREN. In American Journal of Orthodontics 1965 Jan 1 (Vol. 51, No. 4, pp. 312-+). 360 PARK AVENUE SOUTH, NEW YORK, NY 10010-1710 USA: MOSBY-ELSEVIER.
- [12]. Bernstein M. The relation of speech defects and malocclusion. American journal of orthodontics. 1954 Feb 1;40(2):149-50.
- [13]. Doshi UH, Bhad-Patil WA. Speech defect and orthodontics: a contemporary review. Orthodontics. 2011 Dec 1;12(4):340-53.
- [14]. Mason RM, Helmick JW, Unger JW, Gattozzi JG, Murphy MW. Speech screening of children in the dental office. Journal of the American Dental Association (1939). 1977 Apr 1;94(4):708-12.