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A REVIEW ON CEPHALOMETRIC HISTORY TO OBTAIN A PROPER DIAGNOSIS AND TREATMENT PLANS FOR DIFFERENT TYPES OF MALOCCLUSION.

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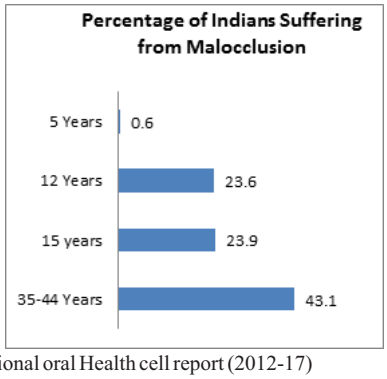
ABSTRACT As per Government of India, Ministry of Health and Family Welfare, National oral Health cell report (2012-17), 43.1% of Indian aged between 35-44 years suffering from Malocclusion. The paper investigates the occurrence of different characteristics and symptoms of malocclusion. Proper diagnosis and an orthodontic treatment at a young age may reduce health risks. There are a lot of problems associated with mouth breathing. Parental care, therefore, plays a significant role in preventing abnormalities and in leading a social life.

KEYWORDS : malocclusion, diagnosis, cephalometry, Oral Disease, treatment plans

INTRODUCTION

The purpose of the study is to explain the history of cephalometry in order to obtain a proper diagnosis and treatment plans for different types of malocclusion. As per Government of India, Ministry of Health and Family Welfare, National oral Health cell report (2012-17), Burden of Oral Disease, Indians suffering from Malocclusion are given below.

Figure-1 Burden of Oral Disease, National Oral health Survey and Fluoride report (2003).



Source: National oral Health cell report (2012-17)

Table-1: Burden of Oral Disease (Multi-centric Survey 2007)

S.No.	Disease	Prevalence
1	Dental Caries	40-45%
2	Periodontal diseases	>90% (Advanced disease in 40%)
3	Malocclusion	30% of children
4	Cleft lip and palate	1.7 per 1000 live births
5	Oral cancer	12.6 per lakh population
6	Oral submucous fibrosis *(pre-malignant and crippling condition of mouth)*	4 per 1000 adults in rural India
7	Dental Fluorosis	Endemic in 230 districts of 19 States
8	Edentulousness (tooth loss)	19-32% of elderly population >65 years
9	Oral lesions due to HIV/AIDS	72% of HIV/AIDS patients
10	Birth defects involving oro-facial complex	0.82 to 3.36 per 1000 live births
11	Others: Traumatic injuries, • Mucosal lesions associated with radiation and chemotherapy • Morbidity and deformity following oral cancer surgery.	

Source: National oral Health cell report (2012-17) [7]

The mouth-breathing problem begins with a discrepancy in the position of the tongue, leads to inadequate skeletal growth and develops the long-face syndrome.

DISCUSSION

Are there any relation between Malocclusion and Mouth breathing?

As their nostrils are smaller, air exhausted through nose creates a back flow of air into the lungs creates irregularity breathing, and alternatively, mouth breathing develops cranio-facial or dento-facial deformation in malocclusion patient. The purpose of this article is to determine the correlation between aetiological factors and mastication disturbances in patients with mouth breathing. According to the theory of Moss's, cranial development is a variation of the morphogenetic behavior of both forms of periosteal and capsular functional matrices. Periosteal matrices include teeth and muscles, while capsular matrices are formulated as enclosed volumes, covered by neurocranial and orofacial capsules. Capsular matrices are the organ and space that comprise a wider anatomical complex responsible for translative growth and, in general, functional space in the facial skull of the oronasopharyngeal cavity. Mouthbreathing affects the growth of maxillofacial portion, occlusion, and muscle tone significantly. In addition to normal growth parameters, mouthbreathers are susceptible to irregular skeletal and dental growth (Harari, 2010) [4] . Moreover, in their study of Angle classification, by Harari et al, it was found that there was a higher tendency of the posterior location of the mandible in the case of oral respiration. As we know, the amount of inhaled and the volume of exhaled air is regulated by nose breathing. Oxygenation of the body occurs during exhalation and not during inhalation. The negative pressure produced in the lungs when exhaled in the breathing pattern of the nose versus the mouth-breathing provides more time to bind oxygen to hemoglobin in the blood. This system requires an adequate concentration of carbon dioxide in the blood. The carbon dioxide level in alveoli and arterial blood must be 5% for oxygenation of brain and muscle cells (West, 2012) [10].

Nitric oxide also plays a role in the oxygenation process and in the effectiveness of oxygen binding. Actuality, in mouth-breathers, the levels of carbon dioxide in the lungs and blood are declining, leading to a lower supply of oxygen to the body cells. The mouth-breathing problem begins with a difference in the position of the tongue, which is supposed to normally rest on the roof of the mouth but drops to the surface of the mouth, which leads to inadequate skeletal growth and therefore-called long-face syndrome growth. Mouth breathing is a dangerous practice. It is an oral reflex, in cases where there are no anatomical causes or barriers to nose breathing (Rao, 2012) [7].

What's wrong with breathing through Mouth?

People do not think about the frequency as well as the procedures they follow for breathing. Normally, a person breathes through his or her nose, allowing the nasal passages to warm up and moisturize the air they are taking. Many men, however, breathe mostly in and out of their mouths instead. This is known as mouth breathing. Many people breathe almost entirely through their mouths, while others have a medical condition, such as sleep apnea, that most of them breathe through their mouths at night. There are several problems may arise with mouth breathing beside open jaw appearance, such as dental problem, hoarseness and speech change etc. These are discussed below:

Dental problem: poor positioning of the jaw is a vital problem associated with mouth breathing which may lead to jaw pain, grinding of the teeth or irregular bite.

Hoarseness: Mouth breathing will dry the whole path, causing a person to have a voice that sounds thick.

Speech Change: Inhalation of the mouth is associated with a higher

risk of speech condition known as lisp. A lisp affects the ability of a person to say the letter "s," rendering the word sound more like "th" when spoken.

Gum Disease: Accumulation of bacterial plaque between and all around our teeth is the most common cause of gingivitis which in turn eventually lead to gingival, or gum, tissue being destroyed.

Dental Disruption: Dental plaque is a biofilm-forming on the teeth naturally. Normally it is formed by colonizing bacteria attempting to adhere to the smooth surface of a tooth. If the plaque is not removed properly, it may harden into calculus or tartar which seems yellow, at the base of the teeth, below the gums. Plaque and tartar gradually decline the condition of the gums, causing gum inflammation around the base of the teeth leading to bleeding of the gum.

Care for Malocclusion (through earlier studies)

Guyer et al. (1986)[3] studied malocclusion (Components of Class-III) in Juveniles and Adolescents. The study found a statistical assessment of Class III malocclusion cross-sectional cephalometric records with serial Class I controls between 5 and 15 years of age and also noted significant trends in the early appearance of distinctive characteristics. The study concludes that there are unique early age skeletal and dental aberrations in patients with Class III malocclusion. However these aberrations may worsen with age, they usually do not begin to develop later in life.

Myers et al. (1988) [5] investigated whether bottle feeding and malocclusion were correlated. The study was conducted using a questionnaire, sent to parents of 737 patients between the ages of 10 to 12, of whom a valid response of 454 had been received. Questionnaires included the type of nipple used, use of a pacifier, process and duration of infant feeding, sucking habits, history of orthodontic treatment and parental orthodontic history. The study concluded that parental orthodontic treatment history ($P < 0.05$) needs to be correlated with the diagnosis. The study found a correlation towards bottle-feeding with the need for orthodontic treatment, but increased bottle exposure was of marginal significance.

Gianelly (1994) [2] suggests that it is a good time to start treatment to alleviate crowding after the eruption of the first premolars. Alternatively, if non-extraction treatment is chosen, arch length preservation in about 75 percent of all crowded patients can provide space for alignment.

Tung et al.(1998) [9] explore psychological issues that should be taken into account in the decision of younger child to begin orthodontics or to wait for young age. After treatment, 75 children and their parent were surveyed, (χ^2=76.08, p<.001) and the study observes that most were attributed to crowded teeth (56%). The parents have greater expectation than children for social life, self image and oral function. The study concludes that young children are good candidates for orthodontic treatment in Phase I, have high self-esteem and body image and expect orthodontics to improve their lives.

Sankey et al.(2000) [8] conducted a cephalometric analysis of non-extraction treatment strategies in 38 patients with an average age of 8.2 years (±1.2 years) with severe vertical skeletal dysplasia and maxillary transverse constriction for 1.3 years. The gonial angle decreased in the treated patients, the articular angle increased, and the chin moved twice as much earlier as in the controls. Treatment resulted in higher overbite and lower overlap. The study concludes that the overall average of individual changes indicates a net improvement, implying that this treatment approach may be suitable in all 3 spatial planes for hyperdivergent patients with skeletal discrepancies.

English (2002) [1] suggests that hyperdivergent open bite malocclusion care must begin when patients aged 7 to 8 years and able to cooperate in treatment; but the ultimate outcome of early treatment depends on the ability of the orthodontist to identify and resolve the cause of malocclusion. Growth has been identified as critical to successful treatment; if a non-surgical technique is to succeed; all skeletal dimensions need early orthopedic treatment.

CONCLUSION

The growth of the maxillofacial area, occlusion and muscle tone are significantly affected by mouth-breathing. In case of mouth breathers, there is a higher tendency of the posterior location of the mandible. Cephalometric development involves surgical and non-surgical treatment. But early age treatment may provide normal growth of any individuals.

From the above studies, it can also be concluded that parental awareness is necessary for any abnormality like mouth breathing, crowding etc. in growing age, particularly 6 to 13 years, when deciduous teeth replaced by permanent teeth. In addition, orthodontic testing and surgery (wherever necessary), at an early age, do not develop disorders in young age or later. Parental care, therefore, plays a significant role in preventing abnormalities and in leading a social life.

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