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## **CHIN-CERVICAL DISTANCE AND ORTHODONTIC FORECAST FOR CHILDREN AGED 6 TO 12 IN MAHAJANGA MADAGASCAR**

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### **Abstract**

Cervico-chin distance is used to assess the length and position of the mandible. Skeletal disorders are aesthetically and functionally detrimental to patients. The objectives were to describe and predict patients' cervicomandibular distance. A cross-sectional descriptive study of 45 children aged 6 to 12 years was carried out without distinction of gender, in the city of Mahajanga, from March to December 2018. Cervico-chin distance measurement was obtained by the equivalent width of three finger crossings. Among the 45 patients, we observed that cervico-facial distance was normal in 24.4%; decreased for the 40% and increased in the 35.5% of patients. Dento-skeletal and functional disorders were significant.

**Key words:** Cervical, Chin, Orthodontics.

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## INTRODUCTION

The profile examination of a subject studies the sagittal development and vertical balance of the face. The cervico-chin distance is used to assess the length and position of the mandible. It must be in harmony with the face. It also plays an important role in the aesthetic balance of the profile [1].

Maxillo-mandibular disorders are aesthetically prejudicial in the form of skeletal and functional deformity, such as upper airway obstruction, for a patient with a life-threatening prognosis, hence the interest of our present study [2].

In Africa in 2004, 15.5% of the population were in class II and 8% in class III [1].

The objectives were to describe and predict orthodontically the cervico-chin distance of patients.

## METHODOLOGY

This is a descriptive cross-sectional study, carried out at the Centre de Soins et de Traitements Dentaires (CSTD) at the Institut d'Odonto-Stomatologie Tropicale de Madagascar (IOSTM). The study period spanned 10 months (March - December) in 2018.

We included: Children aged 6 to 12 years , who came for consultation for aesthetic or functional concerns , with no orthodontic history.

Subjects with incomplete data were excluded.

The sample size was 45 children.

Cervical-chin distance was measured as the width equivalent to three crossbars of the patient's fingers (index, middle and ring fingers) horizontally under the mandible. A forward chin defines an increased chin-cervical distance, and a backward chin defines a decreased chin-cervical distance.

The data collected was entered and analyzed on computer using Excel 2013 software.

**RESULTS****Table 1:** Distribution of children by age

Age	Number (N)	Frequency (%)
Under 9 years	28	62,2
10 years and over	17	37,8
Total	45	100,0

**Table 2:** Distribution of children by gender

Gender	Number (N)	Frequency (%)
Masculine	24	53,3
Feminine	21	46,7
Total	45	100,0

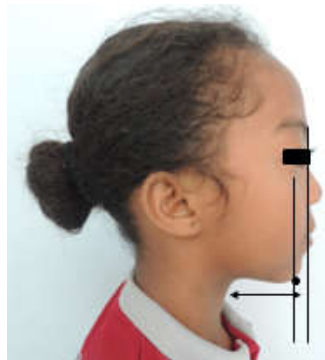
**Table 3:** Distribution of children by chin-cervical distance

Chin-cervical distance	Number (N)	Frequency (%)
Normal	11	24,4
Decreased	18	40,0
Increased	16	35,5
Total	45	100,0

## DISCUSSION

In orthodontics, infantile and juvenile ages are potential periods for dento-maxillo-facial growth. The high number of males in this age group indicates a maternal approach to the care of these children [2].

Normal chin-cervical distance implies overall harmony, and overall aesthetics are appreciated, confirming the typological norm for normo-frontal subjects [3].



**Figure 1:** 11-year-old patient with normal cervical-chin distance (Source: Rakotoson M, 2018).

In the sagittal direction, photographs in cis-frontal profile at chin level, as well as an increased convexity angle and a decreased cervico-chin distance, are consistent with the high frequency of skeletal Class II diagnosis [4].

We can therefore conclude that there is a significant sagittal imbalance of the maxillary and mandibular bases of Class II origin, either mandibular or maxillary, depending on the case [3].

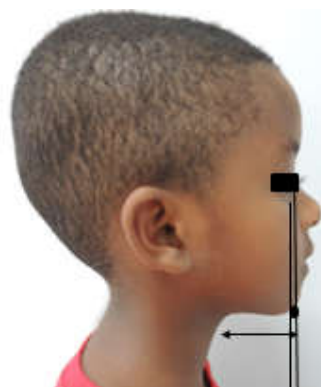


**Figure 2 :** 11-year-old patient with diminished cervical-chin distance (Source : Rakotoson M, 2018)



**Figures 3-4-5 :** Endo-buccal photographs of an 11-year-old patient with diminished chin-cervical distance (Source : Rakotoson M, 2018)

The normal convexity of the profile in young children diminishes with growth. Its increase indicates a Class II shift, while its disappearance or the concavity of the profile indicates a Class III [1].



**Figure 6 :** 9-year-old patient with increased chin-cervical distance (Source : Rakotoson M, 2018)



**Figures 7-8 :** Endo-buccal photographs of a 9-year-old patient with increased chin-cervical distance

(Source : Rakotoson M, 2018)

The shape of the subchin-chin profile and the shape of the lips depend on the balance between protrusions and depressions. The prominence of the lips is analyzed in relation to the nose and chin, which they must balance: the more prominent they are, the more protruding the lips should be [1].

## CONCLUSION

Our study population showed significant sagittal imbalance of the maxillary and mandibular bases. In terms of sagittal dysmorphoses, the majority of patients in this study had a decreased chin-cervical distance. Orthodontic prediction is oriented towards a Class II syndrome from an aesthetic, skeletal, dental and functional point of view. This calls for early treatment of infants for prevention and dento-maxillo-facial interception.

## REFERENCES

1. Boileau MJ, Bazert C, Delbos Y, Rouas P. Therapeutic principles and methods. Diagnostic approach. Elsevier Masson. Tome 1. 2011 ; 4-7.
2. Mascarelli L, Favot P, Boileau MJ, Duhart AM. The Resident's Manual, Dentofacial Orthopedics. EMC - Odontology/Dentofacial orthopedics. 2017 ; 8(4) :1-10.
3. Deffrennes D, Hadjean E, Negrie RB. Nasal disharmony. Encycl Med Chir (Elsevier, Paris) Oto-rhino-laryngologie. 1996 ; 37-92.
4. Moulinier S. Study of facial and oral characteristics of patients with Rubinstein-Taybi syndrome. Surgery. 2014. Ffdumas-01071594ff.