Articulo original

Skeletal and self-esteem modifications with twin blocks.

Modificaciones esqueletales y de autoestima con bloques gemelos.

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ABSTRACT

Skeletal class II and III anomalies are a developmental condition, in most cases, not due to pathological processes, but to a moderate distortion of normal development, this causes alteration of the aesthetic that influences the levels of self-esteem of the patients. The objective of the study was to evaluate the skeletal and self-esteem modifications with twin blocks. We performed a quasi-experimental modality before and after without a control group, in 35 patients with skeletal class II and III, admitted to the Orthodontic Consultation of the University Clinic of Stomatological Specialties "Manuel Cedeño", in the

period from January to November 2018.The clinical examination, the cephalometry and the Self-esteem Inventory prepared by Coppersmiths were used as diagnostic means. It was obtained as a result that 71,42% belong to the ages of 12 and 13 years, and 54,28 % are female; 65,71% of patients presented class II skeletal and 34,28% class III before treatment, after this, the skeletal anomaly was corrected in 91,42% of cases; When characterizing the population under study it was revealed that self-esteem was low in 60,00% before treatment, and then it was high in 74,28%. It was concluded that the population studied presented skeletal anomalies and low self-esteem at the beginning of the treatment, which was corrected and improved, respectively, in the majority of patients by treatment with the standard twin and class III twin blocks.

Keywords: Tooth Abnormalities; Orthodontic Wires; Corrective Orthodontics; Activator Appliances; Self Concept.

RESUMEN

Las anomalías de clase II y III esqueletales son una afección del desarrollo, en la mayoría de los casos, no se debe a procesos patológicos, sino a una moderada distorsión del desarrollo normal, ello provoca alteración de la estética que influye en los niveles de autoestima de los pacientes. El objetivo del estudio fue evaluar las modificaciones esqueletales y de autoestima con bloques gemelos. Se realizó un estudio cuasi-experimental modalidad antes y después sin grupo control, en 35 pacientes con clase II y III esqueletal, ingresados en la Consulta de Ortodoncia de la Clínica Universitaria de Especialidades Estomatológicas "Manuel Cedeño", en el período comprendido entre enero a noviembre de 2018. Como medio de diagnóstico se empleó el examen clínico, la cefalometría y el Inventario de Autoestima elaborado por Cooper smith. Se obtuvo como resultado que el 71,42 % pertenecen a las edades de 12 y 13 años, y el 54,28 % son del sexo femenino; el 65,71 % de los pacientes presentó clase II esqueletal y el 34,28 % clase III antes del tratamiento, luego de éste, la anomalía esqueletal se corrigió en el 91,42 % de los casos; al caracterizar la población objeto de estudio se reveló que la autoestima fue

baja en el 60,00 % antes del tratamiento, y luego fue de alta en el 74,28 %. Se concluye que la población de estudio presentó anomalías esqueletales y baja autoestima al inicio del tratamiento que se corrigió y mejoró, respectivamente, en la mayoría de los pacientes mediante el tratamiento con los bloques gemelos estándar y clase III.

Palabras clave: Anomalías Dentarias; Alambres para Ortodoncia; Ortodoncia Correctiva; Aparatos Activadores; Autoimagen.

Introduction

At the beginning of the century, it was said that malocclusions were produced by the effect of the environment, today it is described that it is due to an interaction between environmental factors and inheritance. The etiology of these alterations is often difficult to identify and multifactorial. This interaction can enhance, alleviate, camouflage and even make a malocclusion disappear. [1]

The position of the teeth inside the jaws and the shape of the occlusion are determined by developmental processes that act on these and their associated structures during the periods of formation, growth and postnatal modification. [2]

Changes in intrauterine and early postnatal growth may have long-term implications for later health, which will have to be corrected by orthodontic therapy, such as the use of twin blocks. [3]

Patients who seek orthodontic treatment often fall into the class II or III skeletal category. The National Survey of Health and Nutrition Examination estimates, approximately, that 14,70% of the population of the United States has class II malocclusion, with a prevalence that decreases from 22,60% between 8 and 11 years of age, to 15,60% between 12 and 17

years of age and then to 13,40% between 18 and 50 years of age. The National Center for Health Statistics reported that 20, 40% of children aged 6 to 11 years have bilateral Class II molar relationships, compared to 14, 50% of children aged 12 to 17 years. The prevalence of skeletal class II malocclusion in the Indian population is 14, 60% for the age group of 10 to 13 years, 6% for the age group of 5 to 9 years and 3, 80% for the group aged 6 to 14 years old. Although maxillary protrusion and mandibular retrognathism are possible causal factors. [4]

The prevalence of abnormalities skeletal anomalies at international level, including Cuba, is high, so they are considered an epidemiological problem of great importance at present, being among the three diseases that constitute a risk of oral health and as a result high numbers of need for orthodontic treatment. [5]

Early treatment by functional methods, even in cases of genetic origin, improves the conditions of stimulation to the mandibular growth, attenuating the lack of relationship between the maxilla and the mandible. [6]

The system of twin blocks is a natural consequence of the evolution of the treatment with functional apparatuses and represents a fundamental transition of the devices of a single piece, to those of two, that favor the movements of laterality. It uses the forces of occlusion appropriately as a functional mechanism to correct malocclusion. This device has had great acceptance in recent years for being comfortable, aesthetic, and easy to build. With its use, it is possible to correct distoclusions and mesoclusions in relatively short periods of time. [7]

The upper and lower bite blocks reposition the mandible and transmit the occlusal forces favorable to the occlusal inclined planes that cover the posterior teeth. With the devices inside the mouth, the patient cannot occlude in the distal or mesial position and the jaw is forced to take a proper bite with the inclined planes fitted in occlusion. [7]

Its use is indicated 24 hours a day with the aim of making the most of all the functional forces that act on the dentition, including the forces of chewing. The upper and lower bite blocks fit together at an angle of 70 ° with the occlusal plane in the fully closed position. [7]

Due to the above, and due to the few researches on the subject, the objective was to evaluate the skeletal and self-esteem modifications with twin blocks.

Method

We performed a quasi-experimental modality before and after without a control group, in patients admitted to the Orthodontic Consultation of the University Clinic of Stomatological Specialties "Manuel Cedeño", in the period from January to November 2018.

The study population was composed of 35 patients with class II and III skeletal with informed consent. The following criteria were considered: class II and III skeletal; permanent dentition; absence of subsequent malocclusion; patients who accept the self-esteem questionnaire; patient between the ages of 12 to 15 years. As an exclusion criterion: patients who do not wish to continue in the study.

The preparation of the orthodontic clinical history was carried out, which allowed collecting the clinical data of interest; impressions were taken for study and work model, as well as the constructive bite until achieving a neutroclusion relationship, taking into account the functional and aesthetic acceptance of the patient. The radiographic study was indicated, including lateral cranial teleradiography, in which Steiner cephalometric measurements were made for the diagnosis (SNA = 82° ± 2°, SNB = 80° ± 2°, ANB = 2°).

The skeletal class II patient was determined when the ANB was equal to or greater than 4°, as skeletal class III when the ANB was less than 0°. The skeletal modification was determined when the skeletal classification (ANB) was between 0° - 3° after the treatment with twin blocks.

The treatment was carried out in two stages: an active one where the anteroposterior relationship was corrected and correct vertical relationships were established, and another maintenance one where what was achieved in the first stage was consolidated. For the patients with skeletal class II, the standard twin blocks were placed, and class III

twin blocks were placed for patients with class III. The device was installed without forgetting the indications for its use, cleaning and care. The first control was performed a week to detect discomfort and verify the adaptation of the same. Then the patients were cited every four weeks to make the corresponding adjustments.

The inventory to evaluate self-esteem was evaluated by the specialist in Psychiatry. To assess self-esteem, the Self-esteem Inventory prepared by Cooper smith,[8] was used, which was applied before and after the treatment. The changes obtained six months after the start of the active treatment phase were determined by means of the clinical examination and the cephalometric analysis of the lateral cranioradiographies of the skull. The data was processed using the Microsta computer program. As a summary measure for the qualitative variables, the percentage and the test of the signs were used, for the quantitative the arithmetic average and the standard deviation (SD), as well as the Wilcoxon assigned rank test. The level of statistical significance was established for a value of $p < 0.05$, very significant for $p < 0.01$ and highly significant for $p < 0.001$.

Results

Table 1 shows the distribution of patients according to age and sex, where it is revealed that 71, 42% belong to the ages of 12 and 13 years, and 54, 28% is female.

Table 1. Distribution of the study population according to age group and sex.

Age	Female		Male		Total	
	Nº	%	Nº	%	Nº	%
12 – 13 years	12	48,00	13	52,00	25	71,42
14 -15 years	7	70,00	3	30,00	10	28,57
Total	19	54,28	16	45,71	35	100,0

Table 2 shows the total number of patients who presented skeletal anomalies of maxillo-mandibular position, 65, 71 % presented class II and 34,28% class III. After the treatment

with the standard and class III twin blocks, the skeletal anomaly was corrected in 91,42% of the patients, classifying as class I.

Table 2. Skeletal modification before and after treatment.

Angle ANB	Before		After	
	Nº	%	Nº	%
Class I	-	-	32	91,42
Class II	23	65,71	2	5,71
Class III	12	34,28	1	2,85
Total	35	100,0	35	100,0

Test of ranges with sign of Wilcoxon   Z= -9,356 p= 0,000

Table 3 shows that before starting treatment 60,00% had a low level of self-esteem related to their appearance, and once the treatment with functional orthopedics was completed, it was gathered that the patients presented high self-esteem in 74, 28%.

Table 3. Self-esteem level before and after treatment.

Self esteem	Before		After	
	Nº	%	Nº	%
High	3	8,57	26	74,28
Medium	11	31,42	9	25,71
Low	21	60,00	-	-
Total	35	100,0	35	100,0

Test of ranges with sign ofWilcoxon   Z= -9,459 p= 0,000

Discussion

The authors state that the purpose of dentofacial orthopedics is to modify the facial growth pattern and the underlying bone structure of the face. The principle of functional treatment is based on repositioning the retruded or protruded jaw in an appropriate position by constructing a removable appliance that, once placed in the mouth, induces an

orthogenetic bite, this leads to a functional displacement of the mandibular condyles and an increase of the intermaxillary space in antero - posterior and vertical direction.

Regarding age, it is favorable that the correction of mandibular position anomalies is corrected at early ages of growth and development, which is favored by changes in the functional physiology of the musculature.

Of the total of patients studied, 65, 71% presented with class II skeletal anomaly. After the treatment with the twin blocks, the skeletal anomaly was corrected in 91,42% of the patients, classifying as class I. Similar result was collected by Cabrera Sánchez, [9] in whose conclusion it was observed that 94,00% of his patients, it was possible to restore mandibular dynamics. Cabrera Sánchez, [10] in another investigation obtained the same result, as well as expressed by Jiménez Yong. [11]

The authors of this research report that the correction of distal occlusion is observed in the first six months of treatment and the therapeutic response is noticeably faster, than that obtained with other functional devices such as the Bionator, this is explained by the continued use of the apparatus, which in addition to being worn during the day and sleep, is also used in the masticatory act, thus taking advantage of the force exerted by the musculature, and therefore establishing a positional pattern of the jaw aesthetically favorable and biomechanically functional.

Class I skeletal classification is the ideal from the aesthetic and functional point of view, this was achieved in the population under study in 91,42%, which speaks in favor of mandibular movements, as well as the pterygoid response emanated from the musculature, which exerts a protrusive pattern of the jaw, the authors say.

Véliz Concepción, [12] recorded in his research, a correction of mandibular position of 75,00% as well as a class I skeletal classification; He argues that the satisfactory results of the research demonstrate the usefulness of functional therapy in order to achieve a morphological and functional harmony from an early age of development. Similar results experienced Cuellar Tamargo, [13] and Garbin Artenio. [14]

The researchers point out that many of the malocclusions observed in the primary dentition are a minimal version of what can be found in the mixed and permanent dentition in the future, if they are not treated in time, since the establishment of mandibular or maxillary position anomalies, or combinations of them, disrupt a skeletal class II or III, which, if not intercepted with orthopedic means from an early age, will require more complex treatments in the adult age.

The understanding of self-esteem has evolved along with the psychosocial paradigms that mark each epoch in correspondence with a relatively stable line of personality of the individual. [15]

Self-esteem consists in knowing oneself capable, feeling useful, considering oneself worthy. [16] This research reveals that patients with class II or III skeletal anomalies have low levels of self-esteem (60,00%), results that coincide with those of Ramos Rangel,[17]who showed low levels of self-esteem (97,1%) in his study population; so it refers also Martínez Brito and collaborators,[18] who showed similar results of low self-esteem (46,7 %).

The integral stomatological treatment allows an improvement of self-esteem, as stated in his research Vinent Cespedes, [19] after occlusal treatment in patients who were previously evaluated with low self-esteem.

The authors point out that the aesthetic involvement of patients who come to orthodontics is significant, since skeletal anomalies are the result of biological and environmental alterations. Patients experience low self-esteem when feeling "different" because of the disposition of the jaws, which is related to the affected smile, which can be improved as patients are treated with the different orthodontic techniques, depending on the affectations and the individual diagnosis of the patient.

The authors point out that research in this regard is very scarce, but it is a reality that self-esteem, as a set of thoughts, evaluations, feelings and tendencies of behavior, affects the population, especially the child and adolescent population, where need for social integration premium as one of their "needs".

Conclusion

The study population presented skeletal anomalies and low self-esteem at the beginning of the treatment, which was corrected and improved, respectively, in the majority of patients by treatment with the twin blocks.

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Conflict of interests

The authors depose not has not conflict of interests.