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ORIGINAL RESEARCH

Prevalence of malocclusions at the Orthodontics Department of the Graduate School, National School of Dentistry, National University of Mexico (UNAM)

Prevalencia de las maloclusiones en el Departamento de Ortodoncia de la División de Estudios de Postgrado e Investigación de la Facultad de Odontología de la Universidad Nacional Autónoma de México

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ABSTRACT

At the Graduate and Research School of the National School of Dentistry, National University of Mexico (UNAM) we developed several analytic and descriptive methods. A statistical study of skeletal classification was undertaken with a sample of 428 patients subjected to orthodontic treatment. Age range of selected patients was 8-40 years. Data were collected according to gender, age and skeletal malocclusion in order to assess the epidemiological panorama. After statistical analysis, it was found among other data, that 53.3% of the sample was in skeletal class I, 64.7% were female and 52.08% was found to be in the 13 to 19 year age range.

RESUMEN

En la División de Estudios de Postgrado e Investigación de la Universidad Nacional Autónoma de México, en el Departamento de Ortodoncia, nosotros desarrollamos diferentes métodos analíticos y descriptivos, donde se realizó estudio estadístico de la clasificación esqueletal con una muestra de 428 pacientes que recibieron tratamiento de ortodoncia. Se seleccionaron personas entre 8 y 40 años de edad. Se capturaron datos de acuerdo a sexo, edad y maloclusión esqueletal para conocer el panorama epidemiológico. Después del análisis estadístico encontramos que el 53.3% de la muestra se encontraban en clase I esqueletal, que el 64.7% eran del sexo femenino y que el 52.08% se encontraba en el rango de edad de 13 a 19 años; además de otros datos.

Key words: Prevalence, malocclusion, epidemiology, skeletal class.
Palabra clave: Prevalencia, maloclusiones, epidemiología, clase esqueletal.

INTRODUCTION

In recent years, many efforts have been devoted to issue a correct diagnosis. In the decade of the 50's, the onset of cephalometric X-rays and the development of different descriptive and analytical methods conferred a new dimension to orthodontic diagnosis. There were limitations of study model classification according to Angle's original concepts.[1] The relationship between upper and lower jaw plays an important role in the positioning of the molars.[2,3] This relationship can only be radiographically determined, and study models can only give an approximate idea of the position of the mandible.[4]

BACKGROUND

The main purpose of cephalometry was to research growth patterns and the maxillofacial system. Cephalometries have assumed an invaluable position in the assessment of dento-facial proportions and clarification of the anatomical bases of malocclusion.[5]

The importance of differential diagnosis among skeletal class I, II and III malocclusions will mainly be the manner in which the malocclusion is remedied with different techniques which can vary from the mesial or distal sliding of teeth as a whole, use of traction masks or extra-oral devices, and even resorting, or not, to conduct extractions.

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The introduction of Down's analysis encouraged several researchers and clinical operators to develop their own analyses. As a result, countless cephalometric brands appeared in the market for skull analysis; they elicited great amounts of useful measurements. Nevertheless, Dr Steiner selected those he considered most important, he created his own analysis whereby he obtained the greatest amounts of clinical information performing a minimum amount of measurements.[6] This analysis was doubtlessly the most commonly used to assess anterior-posterior discrepancies of the maxillary-mandibular binomial, the ANB (point «A», maxillary, point «B» mandibular and point «N» cranial nasion).

The term «anomaly» can be limited or inadequate, but it represents a valid term for the clinical operator who tries to achieve a differential diagnosis of the patients he is going to treat. Anomaly can be described as the deviation with respect to the individual normality. Every individual is different from the others, with a morphogenetic pattern which is normal for him, nevertheless it can present differences in position, volume and shape of the components of the masticatory apparatus. When the term anomaly is thus understood, it facilitates its application in the diagnosis, since it separates what is considered normal from abnormal.[7]

Genetic aspects of occlusion are related to growth patterns of upper and lower jaws, their dental arches vary among each other mainly in anterior-posterior direction, as a consequence of growth vectors established by the genetic pattern.[8]

Information provided by the Instituto Nacional de Estadística, Geografía e Informática (National Institute of Geographic Statistics) (INEGI)[9] reveals that in the last 30 years, population under 14 years of age has noticeably increased, and therefore, the epidemiologic panorama shows that in the near future illnesses of childhood and of senior citizens will experience a noticeable change in distribution of general population.

Alterations in occlusion during puberty are very noticeable, to this we can add the fact of decrease in birth rates and stability of mortality rates, it is then feasible to understand that malocclusions, will, per force, suffer a re-distribution in cases presently treated by the clinical operator.

Growth and development play an important role in orthodontic treatment,[10-13] as well as tooth loss, bone metabolism[14] and periodontal disease.[15-17] All the aforementioned factors represent new challenges for the ingenuity and skill of the clinical operator.

A modern country can ascertain the frequency of malocclusion problems suffered by its population. Dental professionals can become aware of the scope of those problems and thus satisfy the requirements of those afflicted by them. Epidemiologists who gather information on the frequency of malocclusion, obtain data on the prevalence and severity of malocclusions. They furthermore cooperate with dentists, so that gathered information will become pertinent to those who treat patients.

HOW TO APPROACH THE PROBLEM

What amount of skeletal class I, II and II are treated at the Orthodontics Department of the Graduate School, National School of Dentistry, National University of Mexico (UNAM)?

VINDICATION

The Orthodontics Department, Graduate School, National School of Dentistry, National University of Mexico, (UNAM) treats a great number of patients for their different malocclusions, but up to the present date, their epidemiological panorama is as yet unknown. We actually ignore the amount of skeletal class I, II and III malocclusions we are treating. We equally ignore what incidence and prevalence we have periodically. This information is necessary, since, in a more objective manner, if we ascertain what type of skeletal malocclusions we are treating, it would be possible, for instance, to improve the techniques and treatment philosophies which are taught at the UNAM. We would then be able to guide, according to population requirements, the possibility of undertaking surgical or orthopedic treatments which will contribute to solve skeletal problems as well as to diversify treatments in the clinic.

STUDY TYPE

Descriptive, cross-sectioned and retrospective study.

OBJECTIVES

1. To ascertain the number of patients treated in the service.
2. To ascertain the amount of skeletal I, II and III malocclusions which are treated at the Orthodontics Department of the Graduate School, National School of Dentistry, National University of Mexico.
3. To quantify skeletal malocclusions present according to gender and age.
4. To ascertain frequencies of different malocclusions.

METHOD

Files were selected from patients treated at the Orthodontics Department of the Graduate School, from 1998-2004.

To obtain measurement of SNA, SNB and ANB angles (described by Steiner) of initial cephalometric X-rays (S0 sella, N = nasion, A = point Aβ maxillary, and B= point B mandibular) and verify the file; Rank taken was: Skeletal class I 2º ± 2º. Skeletal class II 3º or more and Skeletal class III -1º or more.

The sample was made up according to gender, age and skeletal malocclusion.

STATISTICAL ANALYSIS

Data were captured according to gender, age and skeletal malocclusion, in a calculus sheet of the statistics program SPSS for windows 11.0. Data analysis revealed the following results.

RESULTS

The present study was composed of a 428 patient sample. Age range was 8 to 40 years. Mean age was 16.85 years.

According to the frequency of skeletal class table, there were 228 patients in class I, which represented 53.3% of the total sample, 159 patients in class II, which represented 37.1% and only 41 patients in class III which represented 9.6% *(Figure 1)*.

According to the frequency of gender table, there were 64.7% females (277) and 35.3% males (151) *(Figure 2)*.

In the table which depicts frequency according to age groups, we find, in group 1, age ranges 8 to 12 years (88 patients), represents 20.6%. In group 2, age ranges 13 to 19 years (226 patients) represents 52.8%, and group 3, age ranges 20 to 40 years (114 patients) represents 26.6% *(Figure 3)*.

When considering skeletal class and gender, we find that out of 228 (53.3%) patients in class I, 151 (35.3%) were female and 77 (18%) were male. Out of the 159 (37.1%) patients in class II, 102 (23.8%) were female and 57 (13.3%) were male. Out of the 41 (9.6) patients in class III, 24 (5.6%) were female and 17 (4.0%) were male *(Table I)*.

Square χ^2 was calculated. $\chi^2 = 0.936$, $p = 0.626$. This indicates that there is no association between gender and skeletal class.

When considering age and gender, it was found that out of the 277 (64.7%) female patients, 52 (12.1%) were in the 8-12 year age range, 146 (34.1%) were in the 13 to 19 year age range, and 79 (18.5%)

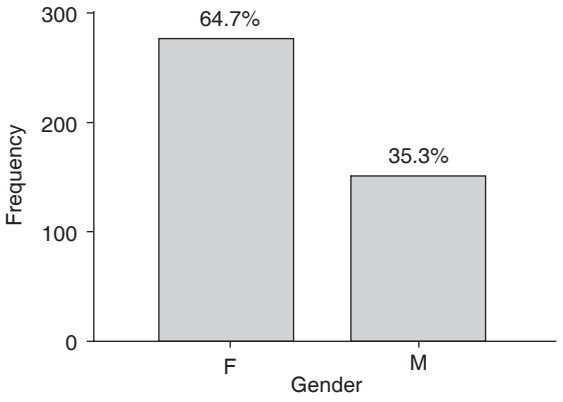

Figure 2. Frequency according to gender.

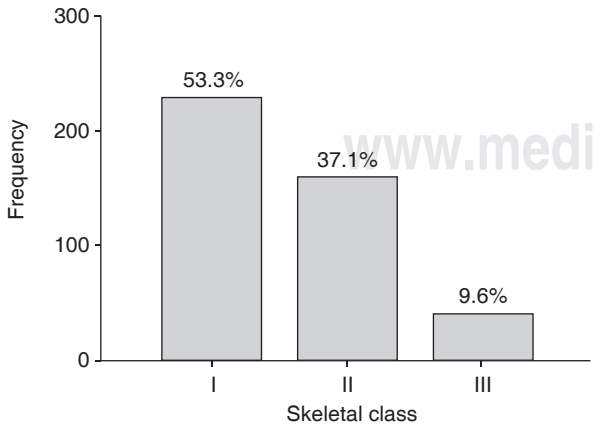

Figure 1. Skeletal class frequency.

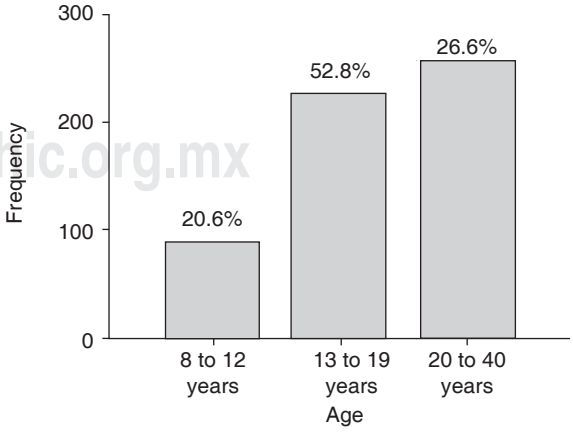

Figure 3. Frequency according to age.

were in the 20 to 40 year age range. Out of the 151 (35.3%) male patients, 36 (8.4%) were in the 8 to 12 year age range, 80 (18.7%) were in the 13 to 19 years age range and 35 (8.2%) were in the 20 to 40 years age range *(Table II)*.

When calculating square χ^2, it was found that square $\chi^2 = 2.269$, $p = 0.322$. This revealed there was no association between age and gender *(Table III)*.

When calculating square χ^2 it was found that: square $\chi^2 = 6.302$, $p = 0.178$. This revealed the fact there was no association between skeletal class and age.

When considering skeletal class and age, we found that out of the 228 (53.3%) patients in skeletal class I, 38 (8.9) were in the 8 to 12 year old range, 124 (29.0%) were in the 13 to 19 year age range and 66 (15.4%) were in the 20 to 40 years age range. Out of the 159 (37.1%) patients in skeletal class II, 40 (9.3%) were in the 8 to 12 years age range, 78 (18.2%) were in the 13 to 19 years age range and 41 (9.6%) were in the 20 to 40 years age range. Out of the 41 (9.6%) patients in skeletal class III, 10 (2.3%) were in the 8 to 12 years age range, 24 (5.6%) were in the 13 to 19 years age range and 7 (1.6%) were in the 20 to 40 years age range *(Figure 4)*.

DISCUSSION

When conducting epidemiological research on malocclusion, it is necessary to somehow characterize the population which is being assessed.[18] The population can be satisfactorily classified according to several methods. Alongside with a strong connotation with orthodontic diagnosis, several researchers in this area concur in asserting that different cephalometric measurements can refer morphological variations. Out of the aforementioned, angles SNA, SNB, and ANB (Riedel 1952) are those which stand out most.

In the realm of orthodontic literature, many studies propose cephalometric norms to endorse harmony between facial profile and skeletal class in several population groups in the world. We could mention some authors who, in addition to the aforementioned angles, chose to endorse their populations with other analyses. Such is the case of Dr Björk, or Dr Tweed, and more recently, Drs Perez and Rosales, who in 1990 stated that through observation of cephalometric measurements it was possible to clarify anatomical bases of malocclusion in different populations, as well as the need to characterize individuals, from an anthropological-physical point of view and thus be able to analyze them from a cephalometric perspective.[19-22]

An article where research was conducted on facial prognathism was cephalometrically endorsed with the use of ANB angle and similar work where there could be variations in the racial groups factor as well as the age factor.[23-26]

Table I. Association between gender and skeletal class.

Skeletal class-gender					
			Gender		
			F	M	Total
Skel. Class	I	Count	151	77	228
		% of total	35.3%	18.0%	53.3%
	II	Count	102	57	159
		% of total	23.8%	13.3%	37.1%
	III	Count	24	17	41
		% of total	5.6%	4.0%	9.6%
Total		Count	277	151	428
		% of total	64.7%	35.3%	100.0%

Table II. Association between gender and age.

Sexo - edad						
			8 to 12	13 to 19	20 to 40	Total
Gender	F	Count	62	146	79	277
		% of total	12.1%	34.1%	18.5%	64.7%
	M	Count	36	80	35	151
		% of total	8.4%	18.7%	8.2%	35.3%
Total		Count	88	226	114	428
		% of total	20.6%	52.8%	26.6%	100.0%

Table III. Association between skeletal class and age.

Clase esqueletal - edad						
			8 to 12	13 to 19	20 to 40	Total
Skel. Class	I	Count	38	124	66	228
		% of total	8.9%	29.0%	15.4%	53.3%
	II	Count	40	78	41	159
		% of total	9.3%	18.2%	9.6%	37.1%
	III	Count	10	24	7	41
		% of total	2.3%	5.6%	1.6%	9.6%
Total		Count	88	226	114	428
		% of total	20.6%	52.6%	26.6%	100.0%

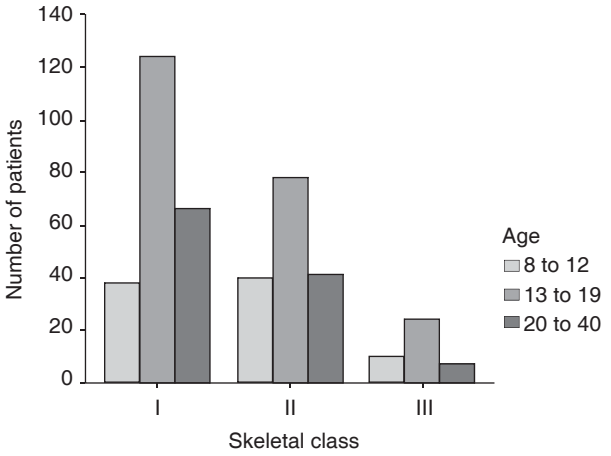

Figure 4. Number of patients, age and skeletal class.

CONCLUSIONS

After statistical analysis we found that maximum percentages were as follows: 53.3% of the sample was in skeletal class I, 64.7% were female and 52.08% were in the age range of 13 to 19 years. Minimum percentages were as follows: 9.6% were in skeletal class III, 35.3% were male and 20.6% were in the 8-12 years age range. This leads us to infer with respect to statistical probabilities of different clinical pictures which we might encounter and show the importance of acquiring knowledge on the growth and development of facial structures, in order to use them at developmental early stages and thus correct skeletal discrepancies, since the patients included in the 8-12 years age group were susceptible to orthopedic skeletal changes and they represented 20.6% of the sample. In a stricter sense, when speaking of anterior-posterior discrepancy of the upper jaws, 45% of all cases should be surgically treated. Moreover, 26.6% of the sample corresponds to age range 20-40 years; this corresponds to adulthood, and represents a challenge to orthodontic techniques. This is due to the different complications inherent to age such as periodontal disease, bone metabolism, loss of teeth, etc.

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