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Research Article

Third Molar Agenesis Frequency in Young Patients Attending Private Orthodontic Consultation

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Abstract

Introduction: The agenesis is a congenital absence of one or more of the deciduous teeth or permanent, associated with different factors. You can commit to various organs, being the third molar which it exhibits the highest prevalence of agenesia at the global level. The objective of the present investigation is to determine the prevalence of tooth agenesis of the third molars in young patients between 14 and 22 years of age attending dental consultation in a private office in the city of Mérida, Venezuela.

Methodology: A descriptive cross-sectional study. 120 patients were selected, which were analyzed by means of the study of clinical histories and panoramic radiographs. The results were organized in a registration form.

Results: Presented agenesia of the third molars in a 23.3%, more frequently in women with a 12.5% in the left maxillary, corresponding to 29.2%.

Conclusion: The results show that the frequency of third molar agenesis is within the percentages reported by the literature. However, its specific cause is unknown.

Keywords: Agenesia; Third Molar; Young People

Introduction

The formation and development of temporal, primary or deciduous teeth and permanent teeth is a continuous and complex process called dentists [1]. Anomalies of different types may occur during the same that affect the shape, size, structure and number of teeth in formation [2-4].

Among the alterations of tooth development we find with higher prevalence tooth agenesis, these may be unilateral or bilateral more frequently, affecting more permanent teething, the female gender and the upper antero region [1].

Agenesis or anodontics is the congenital absence of one or more deciduous or permanent teeth, associated with syndromes, genetic disorders, environmental, pathological and evolutionary factors [1,5-9]. It is considered to be the most common mouth and craniofacial development abnormality of humans and its prevalence varies between phenotypes [2]. The wide prevalence range of this anomaly could be attributed to differences in sampling and examination methods, age and gender [3]. Its prevalence reaches 20% in permanent teething, and its expression can vary from the absence of a single piece, usually a third molar, to that of all dentition [1,4,10,11].

Dental agenesis may compromise several teething organs of human teething; however, there is no doubt that the third molar is the one that exhibits the highest prevalence of agenesis worldwide [4,9,11,12], with the usual order of missing teeth the following: third molars, maxillary and mandibular premolars and lateral incisors [5].

Third molars are the teeth that occupy the eighth place from the dental midline of each hemiarch in permanent dentition and generally present some abnormal condition such as variable root morphology, eruption problems, congenital absence and in a lower percentage of associated pathologies [2,4].

According to various theories, the dental agenesis of this piece has also been attributed to evolutionary factors [4]: History reveals that changes in diet patterns, degree of use of the chewing apparatus and genetic inheritance have affected human facial growth, jaw size and tooth size [3,12-15].

Several authors point to agenesis as an hereditary polygenic character, which is observable in members of the same family. Vastardis reports on the mutation of the MSX1 and PAX9 genes [4,5,9,11,16,17].

The theory of adloff's tooth terminal reduction is also known, which notes that the future disappearance of the third molar in the human species is an evolutionary line to a smaller number of teeth and it has been proven that these factors have contributed to the progressive decrease in the length of the retromolar space, particularly in the jaw [4,6,16].

However, authors such as Rozkovcová., *et al.* suggest that "agenesis should not be considered as a manifestation of the phylogenetic reduction of the number of teeth but as an anomaly of development, the product of a mutation and selection process based on inheritance" [5].

Tooth abnormalities are frequently observed during initial diagnosis of patients who warrant orthodontic treatments, noting that in many cases there is not only the agenesis of the third molars [18].

In this context, considering that the study of the third molar has been of great interest for years as the tooth that has the most variations and complications in its development and represents a common problem for clinicians and patients, different published theories that explain agenesis, but there is still a lack of understanding of the causes of this condition.

In this way, taking into account the importance and the need to update knowledge in different fields such as dental, medical, evolutionary and forensic, the contribution to the study of both dental and anthropological to carry out research and comparisons with ancestors, populations of different backgrounds and for more timely treatments, it is considered relevant to conduct a research paper on the subject, as there is a global background related to research, but no articles on the subject are found in Venezuela, so an up-to-date study on the condition is needed. This research will be carried out in order to establish the frequency of congenital agenesis of the third molar in young patients between 14 and 22 years of age who come to dental consultation in a private practice in Merida-Venezuela.

Materials and Methods

This research is descriptive type [19] as the absences of third molars in the tooth arches, as well as their frequency according to age and sex, will be described.

It has a non-experimental design [19], because there will be no manipulation of the variables because the events of interest to the study will be observed, in this case the presence or not of the third molar. This is a transectional study as data will be collected in a single moment [19].

The population consists of patients who went to a private dental practice to start orthodontic treatment in the city of Merida-Venezuela between 2014 - 2019, who met the following criteria of inclusion: years of orthodontic treatment in the city of Merida-Venezuela between 2014 - 2019, who met the following criteria of inclusion: years of medical records (2014 - 2019), patients who were to initiate orthodontic treatment and ages between 14 and 22 years; selected 120 patients with these characteristics.

Sampling is of a non-probabilistic type, the selection of which was made as a convenience [19], by the study of selected medical histories and panoramic x-rays according to the above inclusion criteria.

The data collection technique used was focused observation [19], as specific categories and points were established to be observed, recording the characteristics of interest. The information collection instrument (Annex 2), previously validated by expert judgement, a specialist in Orthodontics and Orthopaedics and a specialist in Oral and Maxillofacial Radiology (Annex 3), shall consist of a registration sheet adapted to the needs of the investigation, to carry out the objective of the study. For data collection, a simple selection of office medical records will be made, with their respective panoramic x-rays and the data provided will be analyzed.

The list of variables to be measured or observed will be made, which will be defined and organized in the record tab. They are of nominal type and qualitative study, these are: age, gender, jaw (right/left), maxilla (right/left), congenital agenesis, exodontics and presence of third molars.

The registration sheet and the data will be processed digitally, represented graphically to report the frequency distribution, using the SPSS version 24.0 program.

Results

A total of 120 medical records and panoramic X-rays that met the inclusion criteria were reviewed for 58.3% of female patients and 41.7% of the male sex.

The agenesis was diagnosed in a total of 28 patients, an abnormality that dominated the female sex corresponding to 12.5% on the male with 10.8% (Table 1).

No Presents Presents			Congenital agenesis		Total
Sex	Female	Count	55	15	70
	Male	Count	37	13	50
Total		Count	92	28	120

Table 1: *Percentage distribution of third molar agenesis by sex.*

The frequency of agenesis was low, as of total patients, congenital agenesis was only diagnosed at 23.3%, while at 19.2% the agenesis present was due to surgical reasons, the information is expanded in table 2.

It does not present Presents			Congenital agenesis		Total
Presents Molar	It does not present	Count	23	28	51
	Presents	Count	69	0	69
Total		Count	92	28	120

Table 2: *Percentage distribution of congenital agenesis.*

Of the total patients, 21.7% were those who were 21 years of age, who in turn had the highest percentage of congenital agenesis with 7.5%. Followed by patients 14 years of age, who accounted for 18.3% of the population, with a 5% prevalence of agenesis (Table 3).

Also, the quadrant with the most frequency of agenesis was the maxilla on the left side with 29.2%, and in less frequency but with similar percentage, it presented in the jaw in both hemiarches (Table 4).

			Congenial		Total
			No present	Present	
Age	14	Count	16	6	22
	15	Count	11	1	12
	16	Count	12	3	15
	17	Count	10	2	12
	18	Count	8	1	9
	19	Count	9	1	10
	20	Count	7	5	12
	21	Count	17	9	26
	22	Count	2	0	2
Total		Count	92	28	120

Table 3: *Percentage distribution of Agenesis by patient age.*

Maxilla. D	Doesn't have Agenesis	86
	Presents Agenesis	34
Maxilla. I	Doesn't have Agenesis	85
	Presents Agenesis	35
Jaw. D	Doesn't have Agenesis	88
	Presents Agenesis	32
Jaw. I	Doesn't have Agenesis	88
	Presents Agenesis	32

Table 4: *Percentage distribution of Agenesis according to the hemiarch*

Discussion

In this study, the objective was to establish the frequency of congenital agenesis of the third molar in young patients between 14 and 22 years of age who come to dental consultation in a private practice in Merida-Venezuela based on panoramic x-rays and medical records.

The literature reports that the frequency of this tooth piece can be attributed to the genetic, environmental and evolutionary variation inherent in individuals with different numbers of missing third molars [1,3,5,8,9,15,21,23-27]. The results of some authors show that agenesis exists as part of a spectrum of syndromes, this pattern being useful for the clinical diagnosis of genetic mutations [4,8,9,11,22,25,27,28]. Some publications point out that the contributions of the environment and genetics to the agenesis of this tooth piece is not yet well-known [22]. On the other hand, other studies associate agenesis with the infiltration of the alveolar nerve

when the breakout of the dental part is immature and can stop the development of the tooth. However, due to the important clinical implications, more research is needed to verify these results [29].

For the diagnosis of third molar agenesis, x-ray studies are recommended for individuals over 14 years of age [5]. This research was based on this age range, demonstrating a third molar agenesis frequency of 23.3%, coinciding with most of the studies consulted which show prevalence of this agenesis in a range of values from 20 to 30% [1-4,15,21,22,30-33]. Unlike other studies showing percentages other than stos indices, where they report a lower percentage, corresponding to 17.3% [7] and on the other hand, higher percentages corresponding to 32% [16] and 38.4% [34].

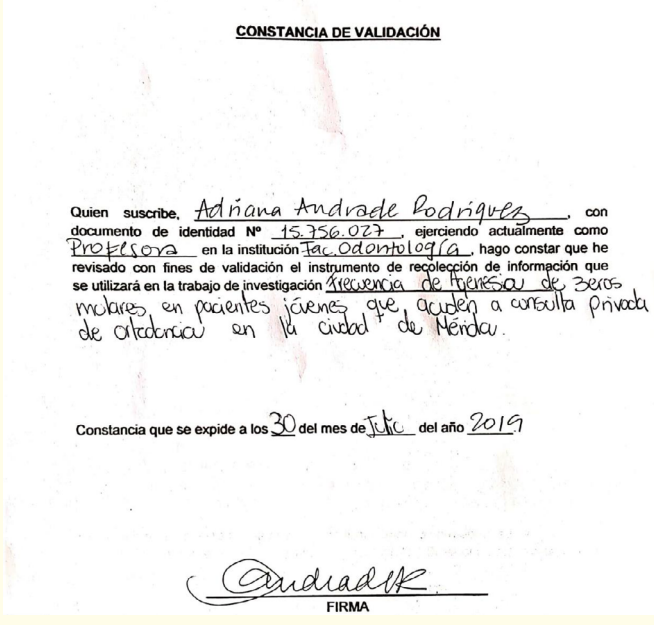
This research results showed a predominance of agenesis in the female sex corresponding to 12.5%, which coincides with most research. Subgroup analyses show that women have a slightly higher agenesis rate than men [1,9,13,15,21,31,34,35]. This is possibly explained by the smaller, graceful jaws of women leading to agenesis, there is mixed evidence that individuals and populations with smaller jaws show higher rates of agenesis [21]. Despite this, other authors found no significant differences according to sex [2,4,7,16,28,32,37].

In addition, third molar agenesis is much more likely in the maxilla than in the jaw [2-4,13,31,33,34,36], in accordance with the results found in this investigation, which place their most frequency in the left hemiarch of the maxilla. However, some authors argue that it is more prevalent in the [7,22] jaw, which differs with our results. Finally, the literature refers that it is more common to be missing 1 or 2 molars and, less common, to be missing 3 or 4 molars [21,35,38-40].

Conclusion

- Third molar agenesis was common in 23.3% of the population of 120 patients aged 14 to 22 who attended consultation between 2014 and 2019, with predominance in the female sex with 12.5%.
- The quadrant most often corresponded to the left maxilla with 29.2%.
- This information is expected to be considered by dentists, given the implications for protocols for orthodontic treatment and extraction of third molars.

Annex



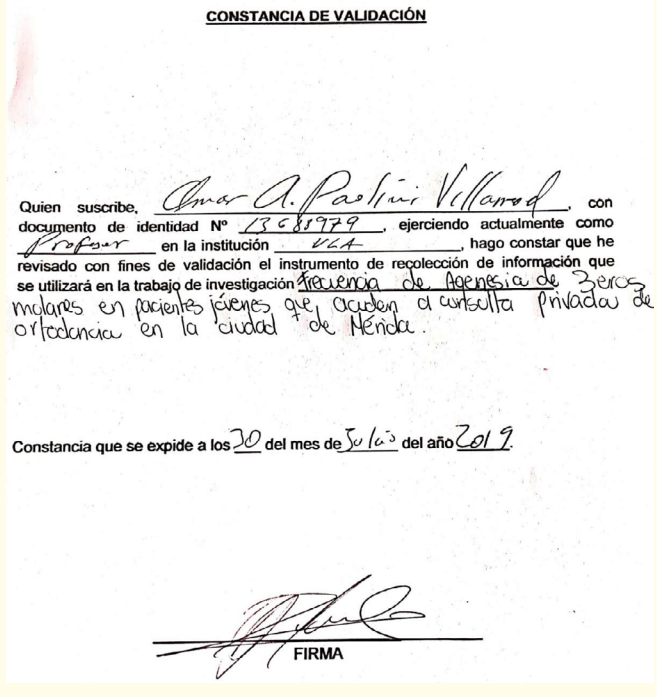
CONSTANCIA DE VALIDACIÓN

Quien suscribe, Adriana Andrade Rodríguez, con documento de identidad Nº 15.756.027, ejerciendo actualmente como Profesora en la institución Fac. Odontología, hago constar que he revisado con fines de validación el instrumento de recolección de información que se utilizará en la trabajo de investigación Frecuencia de Agenesia de 3eros molares, en pacientes jóvenes que acuden a consulta privada de ortodoncia en la ciudad de Mérida.

Constancia que se expide a los 30 del mes de Julio del año 2019

FIRMA

Annex: Expert validation.



CONSTANCIA DE VALIDACIÓN

Quien suscribe, Omar A. Pacheco Villarroel, con documento de identidad Nº 13681979, ejerciendo actualmente como Profesor en la institución UCLA, hago constar que he revisado con fines de validación el instrumento de recolección de información que se utilizará en la trabajo de investigación Frecuencia de Agenesia de 3eros molares en pacientes jóvenes que acuden a consulta privada de ortodoncia en la ciudad de Mérida.

Constancia que se expide a los 30 del mes de Julio del año 2019.

FIRMA

Annex: Expert validation.

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