

Relationship of Blood Type on the Prevalence Between Peri Coronary Follicle and Dentigerous Cyst: Observational Study

Relação da Tipagem Sanguínea na Prevalência Entre Folículo Pericoronário e Cisto Dentífero: Estudo Observacional

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Abstract

The formation of oral structures occurs due to ectomesenchymal cell proliferation, which will originate an anatomical structure known as peri coronal follicle, which undergoes apoptosis after complete formation of the dental crown, causing its eruption. In some cases, there may be impaction of the tooth as a result of an alteration in the reduced epithelium of the enamel organ, which prevents epithelial self-destruction. These changes may be associated with blood type which, based on scientific findings, can prove a correlation between human diseases and the ABO blood system. Thus, the present research project aims to find out if there is a relationship between the anatomical structure of the peri coronal follicle and the dentigerous cyst, comparing it with the blood typing of the individuals who carry it. The research is descriptive with data collection of cases of peri coronal follicle and dentigerous cyst, sent to the histopathological laboratory of the University of Passo Fundo. The prevalence of the ABO blood system found for the anatomical alteration of the peri coronal follicle was A+ and for the pathological structure of the dentigerous cyst it was O+. The other classes, AB, were presented in a smaller percentage, with B+, B-, A- only in the peri coronal follicle, as well as O-. These results conclude that blood typing can establish a predisposition for odontogenic findings, requiring further research to confirm the clinical diagnosis.

Keywords: Dentigerous Cyst. Dental Sac. Blood Grouping. Crossmatching.

Resumo

A formação das estruturas bucais ocorre devido às proliferações celulares ectomesenquimais, o que irão originar uma estrutura anatômica conhecida como folículo pericoronário, a qual sofre apoptose após a formação completa da coroa dentária, ocasionando sua erupção. Em alguns casos, pode haver a impação do dente por consequência de uma alteração no epitélio reduzido do órgão do esmalte, o que impede a autodestruição epitelial. Essas alterações podem estar associadas ao tipo sanguíneo que, com base em achados científicos, pode-se provar uma correlação entre doenças humanas e o sistema sanguíneo ABO. Assim, o presente projeto de pesquisa tem por objetivo averiguar se há relação entre a estrutura anatômico do folículo pericoronário e o cisto dentífero comparando com a tipagem sanguínea dos indivíduos que o portam. A pesquisa é descritiva com coleta de dados dos casos de folículo pericoronário e cisto dentífero, enviados para o laboratório histopatológico da Universidade de Passo Fundo. A prevalência do sistema sanguíneo ABO encontrada para a alteração anatômico do folículo pericoronário foi A+ e para estrutura patológica do cisto dentífero foi O+. As demais classes, AB, apresentaram-se em menor porcentagem, sendo B+, B-, A- apenas em folículo pericoronário, assim como o-. Tais resultados concluem que a tipagem sanguínea pode estabelecer uma pré-disposição para os achados odontogênicos, sendo necessário maiores pesquisas para confirmação de diagnóstico clínico.

Palavras-chave: Cisto Dentífero. Saco Dentário. Tipagem e Reações Cruzadas Sanguíneas.

1 Introduction

Blood is one of the main survival factors that exists in most species, including human. The discovery of the ABO blood group system occurred at the beginning of the 20th century by Austrian researcher Karl Landsteiner, where he was able to verify, through immunological experiments, the incompatibility of red blood cells and their respective components, such as agglutinogens and agglutinin. As well as the discovery of the Rhesus system (RH) and the MN system¹. Many diseases that affect humans are diagnosed through laboratory tests, with the main reference to blood typing².

The dental follicle involves the enamel organ of a developing tooth consisting of mesenchymal cells and fibers,

where it has been demonstrated that cystic or neoplastic buccal lesions can be consequences of the peri coronary follicles of impacted third molars³. Characterized by radiographs by a radiolucent image circumscribed around the crown of a non-ruptured tooth, being a hamartoma lesion associated with delay or even failure in dental eruption in young patients⁴.

Dental cysts, however, are benign cysts of odontogenic and developmental origin, slow to grow, their predilection for males is twice as high as for females, most cases occur in permanent dentition and 70% of cases located in the mandible in individuals between 20 and 40 years of age⁵. Radiographically characterized as a well-demarcated unilocular radiolucity located at the tooth amelocementary junction, being similar to a ceratocyst or even an ameloblastoma, being an asymptomatic

lesion⁶.

In order to clarify more doubts about the subject, the objective of this study is to evaluate whether the influence of the ABO blood group related to the peri coronary follicle and the dental cyst when comparing the blood type of each carrier.

2 Material and Methods

2.1 Universe of research

This is an observational study with descriptive evaluation criteria, with data collection method, of the pathology of cases sent from peri coronary follicle and dental cyst to a histopathological laboratory in the city of Passo Fundo.

Initially, blood types were analyzed, relating them to the appearance of several pathologies, also associated with the oral cavity, in addition to the prevalence of ABO typing in Brazil. The pathological injury of the dental cyst and the anatomical structure of the peri coronary follicle were studied.

2.2 Ethical issues

The project was submitted to and approved by the Research Ethics Committee of University of Passo Fundo, under opinion number 2.308.036/75769317.8.0000.5342, in order to safeguard individuals who were included in the study. There was no patient identification.

2.3 Acquisition of histopathological reports

After approval of the CEP, with access to histopathological reports with extension of different chronologies (1981-2016), patients with dental cyst or peri coronary follicle were distinguished by the order of referral of dentists.

2.4 Sample selection

Patients with oral alterations treated at the Faculty of Dentistry of the University of Passo Fundo were selected. The data were collected in the service sector through its records, where it obtained access to the telephone number. They came into contact with them through telephone calls, asking for information about their blood typing.

In a second stage, the field of consultation was expanded by contacting dentists who had forwarded biopsy parts to the histopathological sector of the University of Passo Fundo.

2.5 Data Analysis

The data obtained were tabulated in order of higher percentage to lower percentage in both oral alterations, dentigerous cyst and peri coronary follicle, and based on the prevalence of blood typing.

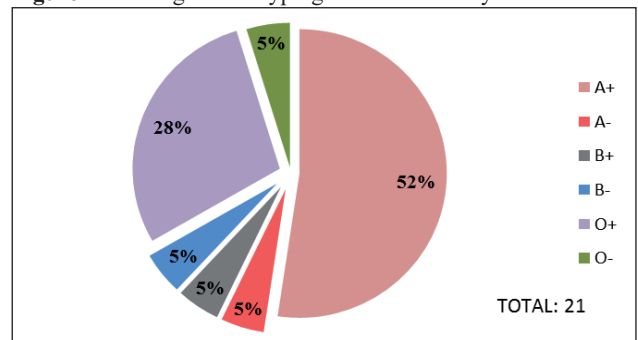
3 Results and Discussion

The data collected showed a large difference between the prevalence of the ABO blood group for the appearance of intraoral alterations.

Figure 1 represents a chart, where patients who presented

the anatomical structure of the peri coronary follicle show that blood typing A with positive RH is more readily available.

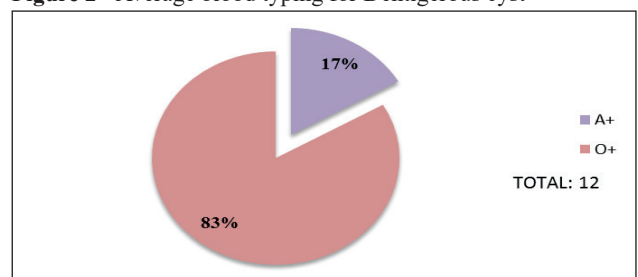
Figure 1 - Average blood typing for Peri coronary Follicle



Source: research data.

Whereas Figure 2, however, represents a chart that shows that patients with dental cyst pathology, show a higher prevalence for typing O with positive RH.

Figure 2 - Average blood typing for Dentigerous cyst



Source: research data.

Based on the other groups, being related to dental cyst, the A+ was found in a lower percentage, 17%. The negative Rhesus factor for this pathology was not found by the research.

This indicates that individuals with negative RH factor present a lower prevalence for the onset of the pathology, as well as those of typing B with positive Rh. B with positive and negative RH presented a lower percentage, manifesting only in a peri coronary follicle. As well as A and O with negative Rh. Whereas O+ was shown to be in second highest prevalence, with 28% of the total.

For 3 years, 16,142 blood donors from the Department of Hemotherapy of the Regional Hospital of Rondonópolis were studied in order to analyze blood predominance in that region. The prevalence of typing O was then obtained, with 53.7% and 31.8%. The frequency of the AB blood group was smaller⁷. As well as the research directed to the blood prevalence of the Hospital Independência of the city of Porto Alegre. In this study, 4,449 blood donors were analyzed in the 1-year and 2-month period through the database. The result was that the type O of the ABO group presented a higher incidence, 48.48% being followed by type A, with 39.01%. Type B and AB are lower in percentage, respectively⁸. In comparison with our study where predominance of blood type A+ and+ can be justified where 21 patients of peri coronary follicle 52% are A+ and 28% are O+ whereas the similarity happens with

dental cyst as well, where the 12 cases presented in the study 83% is O + and 17% A +.

Based on the studies already reported, it is known that there is a relationship between diseases and blood typing. Thus, Demir *et al.* (2007) tried to prove whether there is a comparison between the ABO blood subgroup and one of the most common diseases of the dental field, the periodontal disease. Therefore, 1,351 patients were evaluated and divided into healthy patients, with gingivitis and the latter with periodontitis. The result of the study concluded that patients with blood type A presented larger cases of gingivitis, in contrast to patients with blood type O, who presented larger cases of periodontitis⁹. Just as Vivek *et al.* (2013) who examined clinically and performed blood collection of 220 patients aged 20-55 years with a problem in oral health and randomly selected at the University of Karnataka. The result of the research was that patients with blood typing and positive RH presented a higher prevalence of periodontitis¹⁰. These studies have shown that there is a link between dental diseases related to ABO blood type.

Regarding the anatomical structure of dental eruption, the peri coronary follicle does not present a diagnosis of pathological manifestation for exclusive dental cyst. Non-invasive exams, such as X-rays, may be chosen, but there is no degree of confidence, and the amplitude of the radiolucent halo studied has a similar parameter for both pathological and anatomical lesions¹¹. In histopathologic examinations of the peri coronary follicle in impacted dental elements, the similarity of structural components with pathologies related to the oral cavity resulted, among them the dental cyst¹². Emphasizing the importance of other analyzes for non-invasive pre-diagnosis, routine tests as a complete hemogram, in addition to demonstrating the appearance of systemic alterations, the blood type denotes a pre-disposition to the oral lesions of retained elements, such as the dental cyst.

Research on malignant buccal lesions, such as leukoplasia and submucosal fibrosis, is also highlighted through blood analysis. In this case, there was a predominance of typing A in pre-cancerous patients¹³. Such blood prevalence for intra-oral variations is due to the coincidence of the ABO blood group system distribution to typing A. This is considered the second highest based on the study conducted in Rondonópolis⁷. The data close with the present study, where typing A was the second highest prevalence for both peri coronary follicle and dentigerous cyst.

Another data found in the literature on the impact of third molar parties is provided by the research by Rosa *et al.*¹⁴, in which 151 cases were analyzed, 64.9% of them presented a diagnosis of peri coronary follicle and 35.1% presented a diagnosis of dentigerous cyst. The result was that the prevalence of dental cyst elements was in the mandible, because this region presents greater difficulty with the dental eruption, which may cause inflammatory stimulants and predisposition to cystic lesions. It also suggested that this

prevalence is higher over the years. In fact, the peri coronary follicle presents some clinical, radiographic and histological characteristics of its amplitude, which can be mistaken for the cyst affecting the crown of an impacted tooth. Such relationship may be associated with other predisposing factors, such as blood type.

4 Conclusion

However, the research concluded that a pre-disposition for the pathological appearance of dental cyst in individuals with blood typing O+, and a pre-disposition for peri coronary follicle in individuals with blood typing and A+. The other blood typing such as AB with negative RH factor, O negative and B positive, resulted in similar and minimal percentages, being expressed only in the anatomical structure.

Greater attention is proposed for laboratory tests in order to guide the professional dental surgeon to a predisposition to pathological factors. However, it needs further investigation for clinical diagnosis. Such statements, require further research to confirm clinical diagnosis.

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