BARODONTALGIA: LITERATURE REVIEW

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ABSTRACT

The barodontalgia can be defined as a painful symptom due to a difference in air pressure during ascent and descent of the aircraft. Generally, most cases barodontalgia place during the ascent, which are related to diseases of the vital pulp, and when the descent, with pulp necrosis or facial barotrauma. Pilots and crew are subject to change in air pressure during flight, these changes can lead to dental pain when there are already installed dental pathologies. The tooth has been treated endodontically or vertical fractures may present painful symptoms due to periodontal pockets or periapical lesions. In the case of impacted teeth pain is due to increased atmospheric pressure pericoronal bag during takeoff of the aircraft. It can be concluded that the barodontalgia is related by the atmospheric pressure difference and occurs when an individual is subjected to such pressure, being on a flight or even diving, so it is very important that the dentist must know the origin and causes as well as the treatment of preventive and curative measures.

KEYWORDS: Barodotalgia, atmospheric pressure, flight, diving

1. INTRODUCTION

Pilots are responsible for maintaining security in the life of the crew and passengers, being necessary to maintain in perfect condition to your health, that are not compromised the lives of others by incapacitation professional. This because of that during the flight, the pilots, crew and passengers are subjected to air pressure changes, and by virtue of a dental pathology may predispose it to some painful symptoms known as barodontalgia.

The barodontalgia can be defined as a painful symptom due to a difference in air pressure during ascent and descent of the aircraft. This pain has the etiology unsatisfactory restorations, dental caries without pulp involvement, pulp necrosis with periapical inflammation, pulpitis, apical periodontitis, impacted teeth, root fracture and barossinusite, the first three being the most common.

The first studies on the modification that the pressure exerted on the body have been performed in 1923 with the beginning of aviation. And during World War II, airplanes were subsonic and non-pressurized, which is why there is a higher incidence of barodontalgia today. The pilots call "Blue Wing" were the first to report the symptoms, which lingered for a few seconds and ceased so they found the ground with the landing of the aircraft.

After World War II, the US Navy has tested 12,000 of its pilots as the consequences of pressure differences in the body, soil and altitude, and observed the emergence of barodontalgia between 1,500 and 3,500 meters high. In the same period, the US Air Force recorded 114 individuals of 1,176 (9.7%) airmen with reports of one or more of these episodes on their flights[1,2].

Generally, most cases barodontalgia place during the ascent, which are related to diseases of the vital pulp, and when the descent, with pulp necrosis or facial barotrauma.

The facial barotrauma, is a barometric trauma related to facial cavities includes barotitis media (middle ear barotrauma), external optical barotrauma and barossinusite (sinus barotrauma). The barotitis media is traumatic inflammation of the middle ear area by the pressure difference between the air in the post-tympanic cavity and the atmosphere. External barotitis is caused by damage to the mucosal lining of the external auditory canal and the eardrum. Barossinusite is inflammation of one or more paranasal sinuses by the pressure difference (usually negative) between the air in the nasal cavity and the surrounding atmosphere[3].

It is of utmost importance to maintain the oral health of both pilots as the airmen to be avoided cases of barodontalgia in the air. This can be done through regular visits to the dentist, which will make radiographs, intra and extraoral for investigation of possible pathological factors.

Thus justified such a literature review where there is rebound both management airmen patients, as in the etiology and diagnosis of cases of barodontalgias.

2. MATERIAL AND METHODS

To carry out this study we chose the proposal of Ganong (1987)[4], according to the following steps: 1) identification of the research question, followed by a search of the descriptors or keywords; 2) determining the

criteria for inclusion or exclusion of research in online databases; 3) categorization of studies, summarizing and organizing relevant information; 4) assessment of studies for critical analysis of the extracted data; 5) discussion and interpretation of the examination results, contextualizing theoretical knowledge and evaluating their applicability as; 6) presentation of the integrative review and synthesis of knowledge of each article reviewed briefly and systematic way.

In the present study the guiding question of the integrative review was: verify the occurrence where there is rebound both management airmen patients, as in the etiology and diagnosis of cases of barodontalgias

Bases (Latin American and Caribbean Literature on Health Sciences) LILACS, SciELO (Scientific Electronic Library on Line) and PubMed (- NCBI US National Library of Medicine National Center for Biotechnology Information) were consulted. Studies that have addressed the thematic, published from 1946 to 2012, regardless of the languages of publication were included. The following controlled for the search and also used as keywords descriptors were used: Barodotalgia, atmospheric pressure, flight, diving

3. LITERATURA REVIEW

Pilots and crew are subject to change in air pressure during flight, these changes can lead to dental pain when there are already installed dental pathologies. During the dive it can also be observed the change in pressure, so divers can also suffer from episodes of pain[5,6].

The pain that affects airmen and divers is known as barodontalgia. Its definition is a sense of acute pain in the tooth caused by atmospheric pressure difference during ascent or descent, this pain can cause dizziness or even incapacitation and early flight order or diving[5,6,7].

In 1923 the first cases of pain due to atmospheric pressure have been reported, but it was during the World War II that became more evident due to the use of subsonic aircraft. The pilots complained of acute pain in the tooth that ceased after landing, the phenomenon became known as aerodontalgia[8,9].

In the 1940s the same manifestations of pain in divers were reported, receiving the name of "tooth squeeze", dental grip. Currently, it uses the name of barodontalgia because in both situations the pain is caused by changes in atmospheric pressure[8].

It is that that pain affects both divers and pilots. In divers, the prevalence is 9.2%, when the pressure rises from depth of 33 pés[1] and occurs more frequently in upper teeth. The pilots' prevalence is 21.6% when the pressure rises above 3,000 feet. In flight the barodontalgia affects 11% of the aircrew. The overall change, usually at altitudes of 3000 feet 25000[2], are the most affected due to rapid and extreme situations maneuvers, because there is no pressurized cabins (constant pressure). The upper and lower teeth are affected in equal proportion. agricultural pilots do not suffer from barodontalgia due to flying at low altitude[10,11,12].

Even with studies there is accuracy in the etiology of barodontalgia. But it is known that to have a pre-existing condition is required in oral and paranasal tissues. The risk for barodontalgia consists of pilots, aircraft crews, caisson workers[13].

Facial barotrauma

According to Boyle's law, gas volume is inversely proportional to the ambient pressure. The volume changes within the rigid body cavities associated with the change of atmospheric pressure can cause adverse effects, known as barotrauma[14].

The barodontalgia can be confused with facial barotrauma, which is also caused by pressure difença, but involves the facial cavities and is symptom dental pain. It may present as a traumatic inflammation of the middle ear due to change in pressure between the air in the cavity and the environment, taking the name of barotitis-average, can also present as barosinusitis, which is inflammation of one or more sinus parana -salts. It should be considered the situation for differential diagnosis[6].

Barosinusitis (also known as sinus barotrauma) is an acute inflammation of one or more paranasal sinuses, produced by the pressure difference (usually negative) between the air present in the sinus cavity and is in the atmosphere[3].

Oral and nasal diseases that already exist and should be considered are: acute periapical infection or chronic caries, deep fillings, dental residual cysts, sinusitis and a history of recent surgery[5].

Barodontalgia

The barodontalgia is a dental pain caused by the change of barometric pressure on a tooth that had asymptomatic, can be servera enough to cause vertigo during flight, incapacitation, and cease flying prematurely[1].

Generally, the pain generated in the ascent of the aircraft is related to vital pulp diseases, and pain in the descent to pulp necrosis or facial barotrauma[5].

It is considered that the pain associated with periapical lesions can arise both in ascent and in descent of the aircraft, but in most cases, occurs in the ascent[15].

The tooth has been treated endodontically or vertical fractures may present painful symptoms due to periodontal pockets or periapical lesions. In the case of impacted teeth pain is due to increased atmospheric pressure pericoronal bag during takeoff of the aircraft[5].

It is contraindicated in direct pulp capping airmen patients and recommends endodontic treatment in cases where there is suspicion of invasion of the pulp chamber.

When the dentist performing, endodontic treatment should carefully apply the temporary restoration. In addition, you should train the patient air to detect if there is any break in the restoration. In a pressure change of environment, not filled root canal may lead to emphysema and a facial also the extravasation of intra root canal content to periapical tissues infected[7,16,17].

Oral surgery

When extracting an upper posterior tooth, the dentist must discard the existence of oroantral communication. The oroantral communication can lead to sinusitis and potential adverse consequences after exposure to a pressure change of environment. When diagnosed, it is indicated surgery for closing the communication oroantral[18,19].

4. DISCUSSION

Due to the growing number of professional and amateur divers, air passengers, pilots and flight attendants, be they military or com-panies particular air, the dentists may face with oral conditions related to flying or diving of which require treatment and previous knowledge.

For the group of people susceptible to barodontalgia is related to exposure to sharp variations in atmospheric frequency[19].

Such symptoms are most common in fighter pilots[20]. Likewise this condition occurs due to a sudden difference between the atmospheric air in the tooth cavity and the air present in the environment[15]. Hence this atmospheric difference between the two environments result in compression of some important masticatory elements such as alveolar bone, periodontal ligament and nerve endings of the dental pulp. Therefore, this pressure will lead to exacerbated symptoms the patient.

We must not consider Barodontalgia as a pathological condition, but rather a symptom that arises in most cases due to a condition potentiating a preexisting dental problem. Such dental problems would be tooth decay, impacted teeth, faulty restorations, impacted teeth, fractured teeth, pulpitis, pulp necrosis, apical periodontitis, periodontal pockets, presence of cystic or granuloma lesion, root fracture.

The barodontalgia not only affects restored teeth but also healthy elements[21].

Still relates pulp condition of the dental element with the ascent or descent of an aircraft, or for it to barodontalgia during ascent would be closely linked to pulp problems in that the pulp is still vital, whereas this symptom during the descent of aircraft could be linked to a pulp necrosis or a facial barotrauma[22].

A proof of the damage caused by atmospheric force exerted on the teeth were reported through a case of avulsion and amalgam restoration fracture when an amateur diver reached 35 m depth during the dive, this is deeper than what would be used. Moreover, the author also related cause of the damage, it is closely linked to the high-pressure air which was contained in the drum which gave oxygenation support during the dive, higher than the atmospheric air, which have passed a weak point or fault restoration and caused damage[23].

This fact was also confirmed in a study of the German Navy, which were subject to the effects of changing atmospheric frequency in the dentition over time, where significant differences in deterioration of teeth more exacerbated way professionals found that were in charge of diver or navy-frog men, when compared to the positions in which there was no such exposure as in submarines[24].

By suggesting that civilian or military pilots do not resume their activities until passing through an adjustment of its dental elements by means of a dental treatment. In this case, the suggestion given by the author is not relevant since a good condition of a tooth, the professional is predisposed to suffer from problems such as barodontalgia that it can put at risk during their work. Another factor recommended by the author refers to radical treatment option in case of coronary pulp exposure through the pulpectomy, and still makes a contraindication caveat to direct pulp capping in cases of airmen, it claims that there is a risk of air penetration and reaches the pulp if you choose the direct pulp capping[25,26].

Some authors recommend as a preventive and cautious approach to conduct a thorough analysis of the cavity floor, for the avoidance of doubt whether or not the exposure of the pulp after the end of caries removal, if it has not been such exposure recommend a protection floor with restorative material calcium hydroxide base, and then immediately to restore a definitive materials[27,28 29].

Because of the frequency of cases of barodontalgias not as high in the clinical routine, this factor turns out to be essential for professionals' dentists stay tuned for the care of their patients. For only through a well-made history along with additional tests will get a correct diagnosis and therefore successful treatment.

5. CONCLUSION

It can be concluded that the barodontalgia is related by the atmospheric pressure difference and occurs when an individual is subjected to such pressure, being on a flight or even diving, so it is very important that the dentist must know the origin and causes as well as the treatment of preventive and curative measures.

It is important to regular visits to the dentist for oral health maintenance for prevention of the condition, so that it does not interfere with the welfare of professional.

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