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Sports Dentistry and Dental Traumatology- A Review

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Dental traumatology is a major connecting link between sports and dentistry. Sporting activities have become a huge integral part for those people who want to get involved in recreational activities. Dentistry plays a key role in handling oral and maxillofacial injuries which arise due to any sports activity. Sports dentistry is actually associated with prevention of injuries of oral and maxillofacial region and specific oral diseases in this particular area and its manifestations. Over the years, various preventive measures have become a significant part of sports dentistry which includes the use of mouthguard and dietary counselling. A sports team dentist, who plays a huge part in the diagnosis, management and prevention of injuries and diseases in sports-persons is also a great need in schools and colleges. In this review, we discuss the relationship of sports and dental diseases and how the parents and teachers are becoming an important factor in prevention of sports related injuries.

KEYWORDS: Sports dentistry, Prevention, Dental trauma, Mouthguards

INTRODUCTION

Sports dentistry has gradually grown as speciality in recent years. It is very common among children to get injured while taking part in any kind of sports activity. Dental Trauma is the major bracket which connects sports and dentistry. In recent years, road traffic accidents, domestic violence have contributed immensely to initiate the dental traumatic injuries which is nowadays considered as a dental public health problem.¹

Sports dentistry is the branch of dentistry which deals with prevention and treatment of oral & maxillofacial injuries. It comprises of two components: first is the treatment of oral and craniofacial injuries and second is the prevention of these sports related injuries. Dentists must be knowledgeable about certain treatment modalities in branches of dentistry such as orthodontics, endodontics, and oral surgery to ensure and provide comprehensive dentofacial care.¹ It is very common to encounter various dental traumatic injuries during sports like avulsion, subluxation and concussion to the orofacial region while playing any kind of sport.

Nowadays, preventive measures like helmets, mouthguards have very a less impact on athletes

and these measures have reduced its efficiency to prevent their injuries. But, recent studies suggest that modifications of these protective devices are comfortable, friendly, safer to wear and acceptable to all the sports athletes. In this review, some common sports related dental injuries and their common features, its association with the emergence of risk factors and prevention are discussed.

DENTISTRY AND SPORTS

It is a well-known fact that that physical activity has contributed significantly to our lifestyle among all age groups.² Although there are plenty of reasons for people to participating in different physical activities such as for relaxation, competition, for personality development, for socialization and many more reasons. However, it can also become a cause of concern for persons because at times, either it can lead to some injury or personal disability.^{3,4}

Dental and facial traumatic injuries are common sports related injuries. Some reports even widely suggested that participation in sports activities can carry a risk of sustancial dental injuries.⁵ A study done by the National Youth Sports Foundation for the Prevention of Athletic Injuries,

Inc. estimated that around 10% of sports athletes all over the world can sustain injury to craniofacial region.⁶ Several studies estimate that sports related injuries or accidents were 13-39% of dental injuries and 11-13% of these injuries were maxillofacial injuries.⁷ It has also been suggested that males suffered more from sports-related trauma as compared to females with the most commonly fractured tooth being the maxillary central incisors.⁸

Meadow proposed that in children, sports activities were found to be a significant factor for oral trauma.⁹ With increasing in progression of dental injuries in sports, it becomes a big concern for handling of emergencies with the proper care and maintenance. Jackson (1996), has mentioned about how dental professionals should interact with athletes as well as about the various opportunities of dentists in the world of sports. ⁹ Another study briefly described how dentists can help athletes using their knowledge in different practices in several ways by fabricating mouth guards or conducting pre-season screenings of oral diseases.¹⁰

In 2002, there were three policy statements were recommended by Council of clinical affairs of American academy of paediatric dentistry: Dentists should play a key role in educating the public about the use of protective devices in sports activities which not only reduced the number of injuries but also reduced the cost of preventive care. Prolonged use of preventive measures should be practiced in school and college level sports such as football, ice hockey. Instructions of properly fitted mouthguards in various sports which may cause a risk of dental injuries.¹¹

IMPORTANCE OF SPORTS INJURY TO DENTAL PROFESSIONAL

Some patients who require treatment for tooth, bone and other craniofacial injuries as a result from participation in sports makes an understanding of the importance of sports dentistry. Practically speaking, this field has the ability to deal with diagnostic and therapeutic needs of those patients who have oral injuries and handle the psychological and emotional consequences of these injuries.

Any patient who suffers from trauma due to sports needs a dentist who goes with a practical approach for the treatment of these diseases, either it can be long range health problems or immediate health problems but both are associated with orofacial injuries and its esthetic ramifications.¹² Over the years, recent advancement in dentistry has new techniques and oral appliances which help to protect the patient from various dental injuries.

RISK FACTORS FOR SPORTS INJURIES

It is very important to understand the importance of essential component of any injuries which are known as risk factors. Risk factors are broadly categorized into two categories in sports . These are extrinsic risk factors and intrinsic risk factors.¹²

Extrinsic risk factors

Extrinsic risk factors are the predictors which are not dependent on the injury of individual. These factors are essentially related to sports related activities which are required in a particular sport. for e.g.: activities like jogging, running are more likely to cause stress fracture rather than caused by sports which are playing and exchanging contacts such as boxing, wrestling.¹³

Improper methods like mistakes in practice and training for preparing the various competitions can also be important risk factors for injuries. Other extrinsic factors are quality of surface, climate, and status of the machines to be used by athletes etc.¹⁴

Intrinsic risk factors

These are the predisposing factors which are significantly present in the individual who are sports participants. They can be social, psychological or biological factors which may predispose a particular person to a particular kind of sports injury.¹⁵ A study by Tameta et al.¹⁵ which suggested that intrinsic risk factors are actually related to athletics based injury. Several authors even conclude that there are many intrinsic risk factors which gained an enormous attention among them and are warranted to verify the overall importance of them to the field of sports medicine and dentistry.¹⁵

AGE

Several contributing factors like growth, physical maturity, body strength, coordination and healing ability are all part of the complex realm of intrinsic risks. Several studies concluded that risk of injury in school children who play football increases with increases in age.^{16,17} In contrast, other studies suggested that majority of sports injuries mostly occur in adolescents and risk of injury becomes decreased with an increase in age.¹⁸

GENDER

Gender acts as significant risk factor for sports related dental injuries and show the tendency for boys who are more inclined towards contact sports and also for the fact that men and boys take much more participation in several sports as compared to women and girls.¹⁹

INJURY HISTORY

Several studies assessed the relationship between previous injuries and the risk of recurrence of these injuries. In the results, these studies showed that if these previous injuries were not treated properly, it was not suggestive of a chance of predicting a repeat injury. It was also concluded that certain individuals with diseases like epilepsy, cerebral palsy may remain at higher risk of recurrence of injury.²⁰

BODY SIZE

A number of factors including high centre of gravity, increased leverage due to greater length of limbs may contribute significantly to an increased risk of injury in sports athletes who have increased body weight. A number of studies concluded that increased body weight is predisposing factor for injuries to athletes.²¹

PSYCHOLOGICAL AND PSYCHOSOCIAL FACTORS

Some studies observed that psychological factors like stress, anxiety, low self-confidence have a reduced chance of injury of athletes but increase the risk of fatigue which can be causative factor in sports injury.²²

PREVENTION OF SPORTS RELATED TRAUMATIC OROFACIAL INJURIES

Many sports related traumatic orofacial injuries are preventable; hence, the risk of the injuries can be overcome by athletes through machines which

can be properly used in an appropriate manner. Furthermore, identification of risk factors which are linked with such injuries which are more clearly defined, design of some new protective devices even can more contribute to the prevention of sports related traumatic injuries.

There are some protective devices such as helmets, facemasks and mouthguards which are presently available and useful for reducing the sports related traumatic injuries which are associated with head, face and nose of an athletes. Helmets are currently designed to protect from injuries to the skin of the scalp and other traumatic injuries such as lacerations, concussion. These are the devices which protect from fractures in bones of skull, and lacerations, concussions from central nervous system. Other devices such as facemasks protect the eyes, nose and zygomatic regions from fractures.

Facemasks are made up of different materials like plastics, rubber or welded steel and are coating with the layer of vinyl plastisol. The facemasks were introduced way back during the International Football World cup of 1950. All types of facemasks are varied from different degrees to the protection to the maxilla, forearm or even attached to a helmet to the area of zygomatic region.^{23,24} However, one major disadvantage of facemasks can be its protrusion, which is in the ready grasp of the opponent. Sometimes, it is pulled by player of opposite team during the game, which can result to some serious consequences such as damage to nerve or muscle.²⁵

Mouthguards which were originally developed in 18th century by Woolf Krause were made with the purpose to protect fighters from lip injuries. Lip injuries such as lacerations which was common among in boxers in that era.²⁶ These devices are actually manufactured from gutta percha and were held in place during clenching of teeth. Since 1930's mouthguards became an important part of a boxer's equipment.²⁷

According to the Academy of Sports Dentistry, it is proposed that over 40 sports and other activities need mouth protection for sports participants.²⁸ There are various types of mouthguards such as Stock mouthguards, Mouth formed mouthguards, and Custom fabricated mouthguards.

Stock mouthguards are the cheapest among all the types of mouthguards. They are available in different colors and shapes, and are with or without straps. They can be easily worn among all ages because they have less retention. The disadvantage of these mouthguards are they interfere with the breathing mechanism and even speaking which might cause gagging. It is because of these reasons that leads to their unacceptability among sports athletes.²⁹

Mouth formed mouthguards are available in two varieties: shell lined, thermoplastic boil and bite. Shell lined mouthguards is fixed into shell by placing a mixture of ethyl methacrylate which is then inserted into patient's mouth and spread all over in maxillary and mandibular teeth. If there is an excess, it can be easily trimmed by crown scissors and then they are ready for use.³⁰

Thermoplastic boil and bite mouthguards are fabricated by boiling these mouthguards in hot water which helps in soften the materials of mouthguards and then can be easily inserted into patient's mouth. These mouthguards can be easily moulded into shapes by using fingers and using various movements in mouth for adapting to oral tissues.²⁹

Custom fabricated mouthguards are made by dental professionals using dental impression models and casts of patient's mouth. The advantage of these mouthguards is they hardly interfere with breathing and speech and as a result, these mouthguards are widely acceptable by athletes.³⁰

PREVENTION IN SPORTS DENTISTRY

Services provided by the dental practitioner should be easily available to all athletes and among those who are susceptible to other traumatic injuries. These patients also require counselling related to the prevention and correction of malocclusion due to an injury, and also require immediate treatment of any dental complication arising due to trauma. Training of teachers is also important for the prevention of such injuries, especially among school children.³¹

CONCLUSION

Sports dentistry covers a broad range of prevention and treatment of all oral and

maxillofacial injuries and their manifestations. There is a need of pediatric dentist who should be clinically sound and must have knowledge in sports related injuries among children and adolescents. Increasing number of sports activities such as exercise, competitions in schools and colleges are becoming trend in recent years which means protective devices and preventive options gain utmost attention. In this relation, pediatric dentist must interact with teachers, principals, coaches, parents and other medical professionals to ensure comprehensive dental care. Its responsibility of dentist to give information about sports related injuries, protective devices which helps in increasing in awareness among the general public.

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