Application of Aloe Vera Traumatismo in Young Roller
Oral Health Status in India Lymphangioma of Unusual Location

Discovering Thoughts, Inventing Future
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Cavernous Lymphangioma of Unusual Location: A Case Report

By Dr. Rajesh B. Dhirawani, Dr. Garvita Sahu, Dr. Sanyog Pathak, Dr. Sumit Asrani, Dr. Ankit Sharma & Dr. Ankit Gupta

Abstract- Lymphangioma is a benign tumor leading to hyperplasia of lymphatic vessels. The gold standard for treating lymphangiomas is surgical resection; alternative options being, sclerotherapy reduces the impact and complications of surgery.

Keywords: lymphangioma, cavernous lymphangioma, lymph.

GJMR-J Classification: NLMC Code: WU 290
Cavernous Lymphangioma of Unusual Location: A Case Report

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Abstract- Lymphangioma is a benign tumor leading to hyperplasia of lymphatic vessels. The gold standard for treating lymphangiomas is surgical resection; alternative options being, sclerotherapy reduces the impact and complications of surgery.

Keywords: lymphangioma, cavernous lymphangioma, lymph.

I. Introduction

Lymphangioma is a benign tumor involving the proliferation of lymphatic vessels. The commonly affected regions are head and neck, presenting two-thirds of cases at birth and 90% by the second year of life, and some victims may not manifest lifelong. 

Lymphangioma formed along the tissue planes or penetrate in adjacent tissues, become canalized and accumulates fluid in them. These are classified into three types, namely Capillary lymphangioma, Cavernous lymphangioma, and Cystic hygroma. Another variety being Hemolymphangioma shows vascular as well as lymphatic component.

These hamartomatous lesions contain clear lymph fluid, but some may present clinically as transparent vesicles containing RBCs because of extravasation. Mostly superficial, presenting as a swelling or a mass, but some may extend deeply involving the connective tissue. Amongst these, Cavernous lymphangioma contains dilated sinusoidal endothelium-lined vascular channels devoid of erythrocytes and may appear as subcutaneous nodules, with a rubbery consistency. These are certainly demarcated from capillary lymphangioma. The overlying skin does not show any lesions or changes.

II. Materials and Methods

Cavernous lymphangioma of cheek region is discussed in the present article. The lesion presented with vestibular obliteration on the ipsilateral side and extending to the left maxilla. Diagnosis was made based on radio imagining and histopathology. Both clinical and histological features for proper management concerning this hamartomatous entity are incorporated in the present article.

III. Case Report

A 30-year-old male reported to our department with complaint of slow-growing mass in the right cheek region for ten years giving an unaesthetic appearance. There were no associated symptoms like pain and discharge. He noticed a gradual increase in size for three years. There was no history of trauma or any past illnesses. He complained of mild restriction during mouth opening.

Extra-oral examination revealed facial asymmetry concerning the right middle third of the face, round to oval solitary diffuse swelling extending from the right lateral ala of the nose to preauricular region anteroposteriorly and from right inferior orbital rim to the right commissure area supero-inferiorly. The lesion was measured about 3 × 3 cms in diameter with no change in the color of overlying skin and evident obliteration of the right nasolabial groove [Figure 1].

Figure 1: Pre OP Profile View

On palpation, the swelling was diffuse, soft in consistency; mobile, not fixed to skin, non-tender on palpation, no localized rise in temperature, non-reducible, and compressible, non-pulsatile. Intra-oral examination revealed vestibular obliteration in the right upper region posteriorly.
Fine-needle aspiration cytology (FNAC) revealed the presence of fat cells having eccentrically placed nuclei and empty looking cytoplasm. Fatty material with plenty of polymorphs and few lymphocytes were present [Figure 2].

**Figure 2: FNAC Report**

Under general anesthesia, intraorally 2.5-3 cms maxillary vestibular incision taken. The Lesion was exposed, followed by dissection in the subcutaneous plane [Figure 3]. The facial vein was seen passing through the tumor and hemostasis achieved by ligating the parent vessel and circumscribed 3 X 3 X 3 cms tumor excision was done [Figure 4].

**Figure 3: Exposed Lesion**

**Figure 4: Lesion excised**

Histopathologic examination of the excised specimen showed numerous dilated, sinusoidal spaces of varying sizes within the deeper connective stroma. The vascular areas consist of walls of variable thickness and lined by a single layer of endothelial cells. Some areas show eosinophilic material with lymphocytes and few RBCs [Figure 5].

**Figure 5: H & E stained section shows numerous dilated, sinusoidal spaces of varying sizes within the deeper connective stroma. The vascular spaces consist of walls of variable thickness and lined by single layer of endothelial cells. Some spaces show eosinophilic material with lymphocytes and few RBCs. Vascular channels are infiltrating into adjacent muscle.**

**IV. DISCUSSION**

Oral lymphangiomas usually involve anterior tongue, causing macroglossia, lips, and buccal mucosa. Clinically they appear as nodular or elevated masses and may resemble surrounding mucosa. Histopathologically multiple intervening lymphatic channels are contained within a loose fibrovascular stroma. Lymphangioma is usually confused with hemangiomas very often. The absence of valves and the presence of numerous erythrocytes in hemangiomas is a characteristic feature for differentiation.

The origin of this abnormality explained on the basis of three theories. The first theory entails about any blockage or disruption in the growth of primitive lymph channels during embryogenesis; the second states that
the primary lymphatic sac does not communicate the venous system, while the third hypothesized, that lymphatic tissue was laid down in the faulty region during embryogenesis.

Poor aesthetics becomes the primary concern in patients with cavernous lymphangioma of the cheek. In this case, the lesion was present on the right cheek region with unaltered speech or breathing. Differential diagnoses include hemangioma, lipoma, amyloidosis, neurofibroma. Lymphangioma accounts for about 6% of all tumors, is benign vascular malformation. Lymphangioma of the cheek is a rare entity that often shows slow progressive enlargement of the lesion resulting in swelling over the affected region. Whereas, it can be associated with syndromes like Turner’s syndrome, Noonan’s syndrome, trisomies, cardiac anomalies, fetal hydrops. Treatment depends on the size and location of the lesion, proximity to anatomic structures, and infiltrating into the surrounding tissues, further complicating treatment. Macrocystic lesions are localized and can be excised easily, while microcystic lesions are diffuse and are difficult to remove into Completely excised mass with two cms of safe margin, involving complete depth removed from the adjacent unaffected mucosa. No after-surgery complications like wound dehiscence and scarring were noticed figure [6]. Regular follow up at definite time intervals are being done for assessing the recurrence.

Lymphangiomas did not response to sclerosing agents like hemangiomas.

V. Conclusion

The Differential diagnosis in cases of soft tissue swelling of the buccal mucosa should involve the lymphangioma. As earlier diagnosis will help in better treatment options for the patient. In the present study, surgical excision seems to be the safe and effective treatment of lymphangioma, preventing further recurrence in the future.

Conflicts of Interest: Jabalpur Hospital and Research Center, Jabalpur (M.P.).

References Références Referencias

Mouthguard and Orofacial Traumatismo in Young Roller Hockey Practicers

By Lopes, L & Santos, M

Abstract- Objective: This study aimed to investigate the prevalence of mouthguard used and orofacial trauma in a roller hockey population and verify the several associated factors.

Materials and Methods: An observational cross-sectional study based on clinical observation and questionnaire application to the athletes under search. The sample consisted of 117 roller hockey athletes between 13 and 19 years old, in Portugal, in several clubs which were, Sporting Clube de Portugal, Sport Lisboa e Benfica, Clube Desportivo de Paço de Arcos and Parede Futebol Clube.

Results: The prevalence of mouthguard used was 16.2%, and 56.2% of them used Type II, and 47.4% Type III.

The prevalence of orofacial trauma was 38.5%, in which 71.1% of these dental injuries involved the upper incisors, which were the most affected teeth, both the deciduous and definitive dentition.

At the time of injury, only four athletes wore mouthguards, which 1 type I, 2 of type II and 1 of model III.

Conclusion: Roller hockey is a sport in which the prevalence of mouthguard use is low, and that of orofacial trauma is high. Thus, the mouthguard is a device that should be more used by athletes, since it is useful in preventing these injuries.

Keywords: sports, roller hockey, mouthguard, orofacial injuries.

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Strictly as per the compliance and regulations of:
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1. Introduction

The cause of traumatic dental injuries are usually the result of an external impact on a tooth and its surrounding tissues. (Soares et al., 2016) Dental trauma is thus a public health problem that affects a large number of people, leading in certain cases to irreversible tooth loss, not only during the accident but also during or after treatment. In athletes, trauma often occurs in youth and contact sports, representing an important group in the etiology of dental trauma. (Ferrari & Medeiros, 2002)

Contact sports are those in which practitioners are in direct physical contact with other players or objects, which leads to a higher likelihood of trauma and injury. (Fernandes et al., 2019)

Despite efforts to reduce the number of dental injuries, the incidence is relatively high in children and young people. (Sigurdsson, A., 2013) Mouthguards are a viable option for the prevention of traumatic injuries of the oral cavity during sports practice, and their use is more relevant in contact sports, despite their low frequency. (Collins et al., 2016)

The practitioners of Hockey should use mouthguards to prevent the occurrence of oral trauma, since Hockey is a high-risk collective sport in which physical contact is marked (Galic et al., 2018)

Understand the importance of use the mouthguard by young people who practice a collective contact sport and its relationship with the orofacial trauma suffered by them is the aim of this study.

II. Materials and Methods

This is an observational cross-sectional study with a sample of 117 athletes between 13 and 19 years old practicing a collective contact sport.

It was conducted a study at the Sporting Clube de Portugal, Sport Lisboa e Benfica, Clube Desportivo de Paço de Arcos e Parede Futebol Clube, in their respective sports halls.

Observation and personal and direct interview with the athletes and father/mother/legal guardian were used to collect the following data: gender; age; occurrence of orofacial trauma; circumstances of the fact of orofacial lesion (outside sports, during sports or both); injury location (dental and/or soft tissue); in case of dental trauma, what type of wound occurred in concrete; if a dentist was report after the harm occurred; if you went to a dentist, how long did it take to do so; in case of avulsion of a tooth, is it aware of the possibility of its reimplantation and, if so, how long do you think is proper to do that intervention; and in which transport medium do you think is suitable for; what kind of impact caused the trauma; if it was during sports practice, was mouthguard used at the time of injury; if you used a mouthguard at the time of injury, what type did you use; type of occlusion; presence of risk factors (increased overjet and high caries index); knowledge about what is and what is the function of a mouthguard; frequency of mouthguard use; type of mouthguard; frequency of mouthguard replacement; existence in the club concerned of any advice regarding the use of mouthguards; opinion regarding the relevance of the mouthguard; what are the reasons for not using it.

The observation was made with the individual sitting, facing the observer, with the parent/legal guardian next to him/her and in the place/sports hall/room where the training took place, with the aid of
artificial light. Occlusion and risk factors were evaluated, as well as the presence of traumatic injuries and orthodontic appliances not previously mentioned by the guardians, as well as the DMFT index.

Descriptive statistics were performed for the final sample (absolute and relative frequencies), analyzing universal and independent variables. The binomial test was used to compare two proportions.

The data collected were statistically analyzed using the Statistical Package for Social Sciences (SPSS) version 22.0 software program for Windows and synthesized in figures in the Microsoft Office Excel 2019 software program.

III. RESULTS

For this research, we considered a final sample of 117 young people between 13- and 19-years old roller hockey practitioners, who’re mean, and mode age was 15.3 years and 13 years, respectively. Regarding gender, only 0.9% (n=1) was female. As for sports clubs, 23.1% (n=27) were athletes from Sporting Clube de Portugal, 22.2% (n=26) from Sport Lisboa e Benfica, 32.5% (n=38) from Clube Desportivo de Paço de Arcos and 22.2% (n=26) of Parede Futebol Clube.

Overall, 38.5% (n=45) of the athletes suffered orofacial trauma at least once (Figure 1), which specifically affected the teeth in 71.1% (n=32) of the cases (Figure 2).

Of these, 68.8% (n=22), the affected dentition was the definitive one (most often the definitive maxillary incisors), 25% (n=8) affected the deciduous dentition (most often the deciduous maxillary incisors) and 6.3% (n=2) both dentitions.

Regarding the type of injuries suffered, 62.5% (n=20) of them were coronary fractures, 9.4% (n=3) subluxations, 6.3% (n=2) intrusions, 12.5% (n=4) avulsions and 9.4% (n=3) of another type unknown.

It was observed, regarding the type of impact that led to trauma, that 71.9% (n=23) occurred due to impact with some equipment and 28.1% (n=9) due to impact with another athlete (Figure 3).
Facing the knowledge about the function of the mouthguard, 90.6% (n=106) of the athletes reported knowing their role, and 9.4% (n=11) reported not knowing his paper (Figure 4).

Considering the counseling on the use a mouthguard in the respective sports club, 90.6% (n=106) reported no recommendation, 6.0% (n=7) related that it exists and 3.4% (n=4) describes not knowing/not responding.

The opinion about the use of a mouthguard is variable, 60.7% (n=71) indicated that it could be used, but it is their choice, 37.6% (n=44) that should be used and 1.7% (n=2) indicated not knowing/not answering (Figure 5).

Of all athletes, only 16.2% (n=19) used mouthguard, 52.6% (n=10) Type II and 47.4% (n=9) Type III (Figure 6 and Figure 7).
Of these, 10.5% (n=2) of the individuals had orofacial trauma in the past but already used mouthguard, and 21.1% (n=4) of the individuals had orofacial injury in the past, but not since they started using mouthguard (Figure 8).

At the time of the injury, only four athletes used a mouthguard, which 25% (n=1) used Type I, 50% (n=2) Type II and 25% (n=1) Type III (Figure 9 and Figure 10).
Regarding the athletes’ knowledge about the mouthguard, in the study sample, it was concluded that 106 athletes (90.6%) knew the mouthguard and its function. In Portugal, the values range between 41.8% and 100%, similar to those in other countries where the values range between 51.6% and 97.3% (Antunes et al., 2016; Collins et al., 2016; Galic et al., 2018; Goswami et al., 2017; Lopes, 2014; Matos, 2011; Pacheco, 2012; Sethi et al., 2016; Tiwari et al., 2014).

Thus, it was essential to understand the prevalence of mouthguard use. It was found in the sample of 117 young roller hockey practitioners under study, that 19 (16.2%) used a mouthguard in their sports practice. Of these 19, 10 (52.6%) used Type II mouthguard, and 9 (47.4%) used Type III mouthguard. There are several studies on this subject, both national and foreign. In Portugal, the values range between 0.8% and 18%, and abroad the values range between 4.25% and 91.3%. However, differences between studies should be taken in consideration because of the different age groups and modalities (Al-arfaj et al., 2016; Antunes et al., 2016; Çaglar et al., 2005; Collins et al., 2015; Ferrari & Ferreira De Medeiros, 2002; Figueroa, 2018; Galic et al., 2018; Goswami et al., 2017; Hersberger et al., 2012; Kroon et al., 2016; Lahti et al., 2002; Lieger & Von Arx, 2006; Lopes, 2014; Matos, 2011; Pacheco, 2012; Sethi et al., 2016; Silva, 2013; Tiwari et al., 2014; Vucic, Drost, Wijk et al., 2016).

It was also recorded the prevalence of orofacial injuries. In the study sample of 117 athletes, 45 of them (38.5%) reported having suffered orofacial trauma at least once, and 18 of them (15.4%) suffered trauma for more than once. Of the 45 (38.5%), 32 (71.1%) suffered...
a dental trauma, 4 of them (12.5%) reported using a mouthguard during the incident, 1 of which Type I (25%), 2 Type II (50%) and 1 Type III (25%). In Portugal, the values range between 3.9% and 90%, while abroad, the oscillation between 10.7% and 57.9% is smaller. (Al-arfaj et al., 2016; Çaglar et al., 2005; Collins et al., 2016; Ferrari & Ferreira De Medeiros, 2002; Figueroa, 2018; Galic et al., 2018; Goswami et al., 2017; Hersberger et al., 2012; Juneja et al., 2018; Kroon et al., 2016; Lieger & Von Arx, 2006; Lopes, 2014; Martins et al., 2013; Matos, 2011; Pacheco, 2012; Rattai & Levin, 2018; Silva, 2013; Tiwari et al., 2014; Traebert et al., 2004; Vucic et al., 2016; Zamora-Olave et al., 2018)

It was also under analysis which type of dental injury was the most prevalent, verifying that it was the dental fracture, because of the 32 athletes who suffered a dental trauma, 20 (62.5%) suffered a fracture. In similar studies conducted both in Portugal and abroad, the results were in line with ours with dental fracture as the most prevalent dental injury. (Figueroa, 2018; Galic et al., 2018; Goswami et al., 2017; Lopes, 2014; Rozi et al., 2017; Santos, 2013; Spinas, Mameli, & Giannetti, 2018)

Regarding the type of tooth most affected, it was found that the maxillary incisors were the most injured tooth type in both dentitions, both deciduous with seven individuals (6%) reporting trauma to these teeth, and the definitive one in which 18 individuals (15.4%) stated the same. In studies carried out in Portugal, the results were identical to ours, with the upper incisors being the target of trauma more frequently, as in outside studies. (Juneja et al., 2018; Lahti et al., 2002; Martins et al., 2013; Rozi et al., 2017; Santos, 2013; Spinas et al., 2018)

It was found several kinds of impacts during sports that may be responsible for orofacial trauma, of the 32 of injuries sustained during sports, 23 (71.9%) occurred due to impact with some equipment, and 9 (28.1%) due to impact with another athlete, with no injury due to impact with the ground. As for other studies conducted abroad the results vary: (Lahti et al., 2002) reported that 48.9% of athletes suffered impact-related orofacial trauma with sports equipment, specifically with the stick. (Collins et al., 2016) reported that 61.3% of dental injuries were due to contact with another athlete, 31.5% to impact with some equipment, 4.1% to impact with the playing surface and 3.2% for another or unknown and (Vucic et al., 2016) reported that the main cause of orofacial trauma was impacted with the ball (57%), followed by impact with the stick (39%).

One of the objectives of this study was to verify whether there is a correlation between increased overjet and orofacial trauma. We then observed that of the 32 athletes who suffered a dental trauma, 6 (18.7%) had an overjet greater than 3mm, unlike the remaining 26 (81.3%) who had an overjet less than 3mm. Comparing with similar studies, the results obtained were quite different. We have (Traebert et al., 2004) who reported that children with overjet larger than 5mm suffered more dental trauma (15.3%) than children with overjet up to 5mm (9.9%), (Martins et al., 2013) who mentioned that the prevalence of overjet children over 3mm was 21.6%, not being statistically significant in relation to dental trauma and also (Juneja et al., 2018) who found that among children with overjet than 3mm 13.4% suffered traumatic dental injury. Among children with an overjet smaller than 3mm, 9.6% suffered traumatic dental injury.

Finally, our main objective was to understand if the mouthguard use decreased the prevalence of orofacial trauma. Orofacial injuries occurred to only four athletes using mouthguard, which 2 (6.3%) only once, and 2 (6.3%) more than once. So, the distribution was as follows: 1 athlete (25.0%) used Type I, 2 (50.0%) used Type II, and 1 (25.0%) used Type III mouthguard. We also observed that of the 19 athletes currently using mouthguard, 6 (31.6%) had already suffered orofacial trauma during past roller hockey practice, and 2 (10.5%) had orofacial trauma in the past, but already used mouthguard and 4 (21.1%) suffered orofacial trauma in the past, but not since they began using mouthguard. Thus, the remaining 13 (68.4%) had never suffered orofacial trauma in the past. Regarding the type of mouthguard currently used by these 19 athletes, there was the following distribution: 10 athletes currently use Type II mouthguard, and 6 (31.6%) did not suffer orofacial trauma in the past, 1 (5.3%) had orofacial trauma in the past, but already used mouthguard and 3 (15.8%) had orofacial trauma in the past, but not since they started using mouthguard. Regarding the Type III mouthguard, 9 athletes currently use it, and 7 (36.8%) did not suffer orofacial trauma in the past, 1 (5.3%) had orofacial trauma in the past, but already used mouthguard and 1 (5.3%) has suffered orofacial trauma in the past, but not since they started using mouthguard. In Portugal, Silva (2013) concluded mouthguard would be effective. In studies abroad, (Lieger & Von Arx, 2006) and (Tiwari et al., 2014) had satisfactory results relatively the reduction of trauma by mouthguard, unlike (Kroon et al., 2016) who found that 135 athletes used mouthguard at the time of injury and 131 did not, thus registering a higher occurrence of injuries among athletes using mouthguard.

V. Conclusion

The mouthguard should be increasingly used by all roller hockey athletes, and they must be sensitized and advised to use it to avoid orofacial injuries and whose consequences may be manifestly negative.

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Mouthguard and Orofacial Traumatismo in Young Roller Hockey Practicers


Application of Aloe Vera in Dentistry

By Aniket U. Vaidya & Manisha M. Khorate

Abstract- Research since ancient times have claimed the therapeutic benefits of Aloe Vera in medical field. The role of Aloe Vera in reducing inflammation is already established. The recent research has thrown light on the immunomodulatory properties of Aloe Vera gel. The immunomodulatory property of Aloe Vera is attributed to the various polysaccharides present in the gel, primarily Acemannans. In this review the possible use and applications of Aloe Vera in dentistry is elaborated.

Keywords: aloe vera, herbal, alternative medicine.

GJMR-J Classification: NLMC Code: WU 210
Application of Aloe Vera in Dentistry

Aniket U. Vaidya & Manisha M. Khorate

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I. Introduction

Alternative medicine is described as ‘Any of various systems of healing or treating disease (such as chiropractic, homeopathy or faith healing) not included in the traditional medical curricula of the United States and Britan’ (Mandala, 2017). This term is loosely used for almost all the forms of medicine except Allopathy. Alternative medicine practice exists in all the cultures worldwide and terms such as traditional medicine, indigenous medicine or folk medicine etc. are used to describe such practices. Every country or region has its own traditional system of health and medical care such as the Chinese created acupuncture, the French practice magnetic healing, the Germans widely use Heilpraxis, the English use Herbalism, the Indians believe and practice Ayurveda with Siddha, the Japanese are known for Shiatsu etc (Newcomer, 2017).

In India, Ayurveda is being practiced for more than 5000 years. Ayurvedic philosophy is such that illness is a state of imbalance among the body's systems that can be detected through such diagnostic procedures as reading the pulse and observing the tongue. Nutrition counselling, massage, natural medications like various herbs, meditation and many other modalities are used to address a broad spectrum of ailments (Newcomer, 2017; Indian Board of Alternative Medicines, 2014). Presently, herbal medicines are gaining more attention due to their lesser side effects. Recently the popular interest and use of Aloe Vera (AV) gel has increased dramatically. It is one of the most widely used ingredients in healthcare and cosmetic products and is readily available all over the country. This review throws light upon the various uses and applications of AV in dentistry.

II. Aloe Vera (AV)

AV is perennial succulent xerophyte, several species of which have been identified namely Aloe Vera, Aloe barbadensis, Aloe ferox, Aloe chinensis, Aloe indica, Aloe peyrii, etc. Amongst these Aloe barbadensis Miller is accepted unanimously as the correct botanical source of aloe (IARC Monographs, 2015). This plant is commercially cultivated in India, Haiti, Aruba, the United States of America, Bonaire, South Africa and Venezuela (IARC Monographs, 2015). In India, it is seen plenty in the coastal areas of Maharashtra, Gujarat and South India (Reddy et al., 2012).

Historical Perspective: In Mesopotamia, clay tablets dated 1750 B.C. showed that AV was being used in a pharmaceutical manner. In 74 A.D., a Greek physician, Discordes wrote a book titled, ‘De Materia Medica’ in which he stated that AV can treat wounds, heal infections of the skin, cure chapping, decrease hair loss and eliminate haemorrhoids (Shelton R M 1991). Now a days it is used very much in cosmetic industry whereas the original commercial use of the AV plant was in the production of a latex substance called Aloin which is a yellow sap used for many years as a laxative ingredient (IARC Monographs, 2015). The Ayurvedic Pharmacopoeia of India recommends the use of dried juice of leaves in dysmenorrhea and diseases of the liver (Rajeswari R et al., 2012).

AV extracts shows antimicrobial activity and hence it is used to treat the pimples, acne and mouth ulcers. It has also been used to control bleeding, itching of piles and relief from arthritic pain. Historically the Chinese used the aloe vera juice as a mild laxative wash for piles, abscesses and scabies. In the Philippines, it was used to treat dysentery and pain in the kidneys. It was also used as aperients, anthelmintic, carminative, deobstruent, stomachic and diuretic (Kumbhar PS et al., 2015). Juice is also used in skin care medicine, amenorrhea, dyspepsia, burns, colic, hepatopathy, splenopathy, constipation, span menorrhrea, abdominal tumors, carbuncles, sciatica, lumbago and flatulence (Kumbhar P S et al., 2015).

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III. PARTS OF THE ALOE VERA LEAF: (FIG. 1)

a) Outer Protective Layer of the Leaf
The bitter yellow latex of pericyclic tubules in the outer layer of the leaves contain derivatives of hydroxyanthracene, anthraquinone and glycosides aloin A and B in the percentage of 15 – 40%. The other active principles of Aloe include hydroxyanthrone, aloes – emodin-anthrone 10-C-glucoside and cronies (Sahu PK et al., 2013).

b) Middle Layer of the Leaf
The middle layer of the leaf also contains bitter yellow latex containing anthraquinones and glycosides. The parenchymatous tissue or pulp contains proteins, lipids, amino acids, vitamins, enzymes, inorganic compounds, small organic compounds and different polysaccharides (Sahu PK et al., 2013).

c) Inner Layer of the Leaf
The innermost layer of leaf gel contains water upto 99%, with glucomannans, amino acids, lipids, sterols and vitamins. The other potentially active ingredients include enzymes, minerals, sugars, lignin, saponins, salicylic acids, and amino acids. It has numerous monosaccharide’s and polysaccharides; vitamins B1, B2, B6, and C and several inorganic ingredients, enzymes (acid and alkaline phosphatase, amylase, lactate dehydrogenase, lipase) and organic compounds (aloin, barbaloin, and emodin). The main functional component of AV is a long chain of acetylated mannose (Sahu PK et al., 2013).

IV. CHEMICAL COMPOSITION OF ALOE VERA

The AV plant contains 98 - 98.5 % water, with an average pH of 4.5, refractive index of 1.3340 - 1.3355 and specific gravity of 1.0030 - 1.0070. The remaining solid material contains over 75 different components (Kumbhar PS et al., 2015). (Table 1)

Table 1: Composition of Aloe Vera Gel (IARC Monographs, 2015; Kumbhar PS et al., 2015; Mangaiyarkarasi SP, 2015; Nair GR et al. 2016; Naroor N et al., 2014; Pol JS et al., 2016)

<table>
<thead>
<tr>
<th>1. The principal ingredient</th>
<th>Water 98.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Other ingredients</td>
<td>Aloe, Barbaloin, Ethereal oil, Cinnamic acid, Isobarbaloin, Emodin, Emodin glucosides of d – Arabinose, Ester of cinnamic acid, Resistannol</td>
</tr>
<tr>
<td>3. Inorganic ingredient</td>
<td>Calcium (30mg/dl), Potassium (13.4meq/l), Chlorine (3meq/l), Sodium (8.7meq/l), Manganese, Zinc (31mg/dl), Copper, Iron (15mg/dl), Magnesium (3.9mg/dl)</td>
</tr>
<tr>
<td>4. Amino acids</td>
<td>Lysine (5-6ppm), Histidine (2.8-3.3ppm), Arginine (4.5-5.5ppm), Hydroxyproline, Aspartic Acid (13-15ppm), Threonine (5-6ppm), Serine (6-7ppm), Glutamic acid (13.5-15.5ppm), Proline (8-9ppm)</td>
</tr>
</tbody>
</table>
V. Medicinal Properties and Therapeutic Potential of Aloe Vera

a) Burns and Wounds

AV gel has been tested for its efficacy on inflammation many times. The earliest experiments were carried out in 1930 which involved use of AV gel on skin burns. It was believed that the aloe or its components are useful for wound healing and in burns (Kumbhar PS et al., 2015).

b) Tissue Oedema

In an experiment, a swelling was produced caused by fluid accumulation in a tissue (Oedema) initiated by irritating compounds and it was used as an inflammatory model in the mouse ear or rat hind paw as subjects. Croton oil, a powerful irritant, was applied to the right ear with the left remaining as control. Inflammation was measured by weighing a tissue punch sample and it was shown to decrease after topical application of aloe gel. A subsequent trial demonstrated an even greater decrease when the gel was combined with a corticosteroid (Kumbhar P S et al., 2015).

c) Digestion

The Anthroquinones present in the outer leaf acts as a laxative and stimulates the bowels to move and helps with elimination if a person is constipated (Kumbhar P S et al., 2015; Reddy L et al., 2012).

d) Rheumatoid Arthritis

AV helps to strengthen joint flexibility and helps in the regeneration of body cells. It strengthens joint muscles which is beneficial to reduce pain and inflammation in weakened or aged joints (Kumbhar P S et al., 2015).

e) Anti-Cancer Activity

Acemannan is a molecule in AV gel. It was seen that growth of a murine sarcoma implanted in mice, showed regression after Acemannan treatment, probably due to an immune attack. Injection of mice with Acemannan inhibited the growth of murine sarcoma cells implanted subsequently and decreased mortality by about 40%. Aloe polysaccharides show evidence of anticancer effects by modifying and accentuating the immune response during activation of macrophages. Aloe-emodin induces apoptosis in T - 24 human bladder cancer cells (Joeng H Y et al., 1994; Kumbhar P S et al., 2015; Merriam E A et al., 1996).

f) Anti-Diabetic Activity

Historically, dried aloe exudates have been used in Arabia in diabetes treatment. In an experimental study, in normal mice, both Gibenclamide (10 mg/kg twice daily) and aloe (500 mg/kg twice daily) induced hypoglycaemia after 5 days. In the diabetic mice, fasting plasma glucose was significantly reduced by Gibenclamide and AV after 3 days (Ghannam N et al., 1986). Thus it can be conclude that AV contains a hypoglycaemic agent which lowers the blood glucose, the mechanism of which is yet known.

g) Antimicrobial Activity

The comparative antimicrobial activities of the gel and leaf of AV were tested against Staphylococcus Aureus, Pseudomonas Aeruginosa, Trichophyton Mentagra- phytes, Trichophyton Schoeleinii, Microsporium Canis and Candida Albicans. Ethanol was used for the extraction of the leaf after obtaining the gel from it. Antimicrobial effect was measured by the appearance of zones of inhibition. It was found that Anthraquinone inactivates various viruses such as herpes simplex, varicella zoster and influenza (Kumbhar PS et al., 2015).

In an in vitro experiment, theantimicrobial activity of an AV tooth gel (forever bright tooth gel) and commercially popular tooth pastes (Colgate Palmolive) was evaluated. It was concluded that AV tooth gel was effective than the commercially popular toothpastes in controlling all the oral organisms like Streptococcus Mutans, Candida Albicans, Lactobacillus Acidophilus, Streptococcus Mitis, Enterococcus Faecalis, Prevotella Intermedia, and Peptostreptococcus Anaerobius (George D et al., 2009).

h) Immunomodulatory Property

The immunomodulatory activity of Processed Aloe Vera gel (PAG) was evaluated in vivo in mice. Oral administration of PAG significantly reduced the growth of C. Albicans in the spleen and kidney following intravenous injection of C. Albicans in normal mice. PAG
administration also reduced the growth of _C. Albicans_ instreptozotocin-induced diabetic mice. PAG administration did not increase ovalbumin (OVA)-specific cytotoxic T lymphocyte (CTL) generation in normal mice, but did increase it in high fat-diet induced diabetic mice. These findings provide the first clear evidence for the immunomodulatory activity of orally administered AV gel (Im S A et al., 2010).

**Periodontitis**

Bhat G et al. (2011) evaluated the clinical effects of subgingival application of AV gel in periodontal pockets of adult periodontitis patients after mechanical debridement. In this study, 15 subjects were evaluated for clinical parameters such as plaque index, gingival index, probing pocket depth at baseline, followed by scaling and root planning. Test site comprised of scaling procedures followed by intra-pocket placement of AV gel which was compared with the control site in which only scaling and root planning was done and clinical parameters were compared between the two site sat 1month and 3 months from baseline. Results of this study exhibited encouraging findings in clinical parameters of the role of AV gel as a drug for local delivery and it was concluded that subgingival administration of AV gel results in improvement of periodontal condition and hence AV gel can be used as a local drugdelivery system in periodontal pockets.

**Alveolar Osteitis (Dry Socket)**

Acemannan hydro gel is used in the treatment of dry socket. Poor MR et al. (2002) carried out a comparative study of treatment of Alveolar Osteitis with Clindamycin soaked gel foam and freeze dried pledget that contains Acemannan Hydrogel obtained from inner gel of AV. A retrospective evaluation was done of records of 587 patients (1031 sockets) treated with Clindamycin soaked gel foam and a prospective trial was performed by treating 607 patients (1064 sockets) by placing Acemannan hydrogel into the sockets immediately after extraction. The results of the study showed that 78 of 975 sites (8.0%) in the Clindamycin Gelfoam group developed Alveolar Osteitis whereas only 11 of 958 sites (1.1%) in the Acemannan Hydrogel group developed Alveolar Osteitis (P <0.0001).

**Oral Submucous Fibrosis**

Sudarshan R et al. (2012) carried out a preliminary study to compare the efficacy of AV with antioxidants in the treatment of oral submucous fibrosis (OSMF). In this study, 20 subjects with OSMF were included. Patients are divided into two groups, Group A received 5 mg of AV gel 3 times daily for 3 months and Group B received antioxidant capsules twice daily for 3 months. At the end of the study the authors concluded that AV group showed a better treatment response in reducing the burning sensation and enhanced mouth opening as compared to the antioxidants group. Hence it can be applied topically and effective in the treatment of OSMF.

**Oral Lichen Planus (OLP)**

Hayes S M (1999) was first to report the medical use of AV for treating lichen planus. The patient was asked to drink 2 oz. of stabilized AV juice daily in addition to application of AV lip balm for lesions on the lip and 75% cutaneous AV cream. After one month there was complete healing of the oral lesions and the cutaneous lesions decreased gradually over a period of 4-5 months without any recurrence.

In a study done by Reynolds T and Dweck A C (1999), on various components of AV leaf gel they reported that polysaccharides of the inner gel of AV have a varied immunomodulatory activity. The polysaccharides from the AV gel contains multiple factors and components in the form of interleukin monotypes which directly acts on the immune system to reduce symptomatic inflammatory features which can prove effective in treatment of OLP.

A randomized controlled study was performed to compare the efficacy of AV and placebo in the topical management of OLP. The AV gel which they formulated consisted of 70% AV mucilage, sorbitol, potassium sorbate, sodium metabisulphite and hydroxyethyl-cellulose and the placebo gel contained the same ingredients except AV mucilage. The AV gel used in their studyproved to be statistically significantly more effective than placebo in inducing clinical and symptomatological improvement of OLP (Choohnakam C et al., 2007)

Salazar Sanchez N et al. (2010) conducted a study on 64 patients to check the efficacy of topical AV in patients with OLP. In this study, patients were asked to apply 0.4 ml AV gel [70% with water, sorbitol, E-202 (potassium sorbate) and E-223 (sodium metabisulphite)] and 0.4 ml of placebo gel [water, sorbitol, E-202 (potassium sorbate) E-223 (sodium metabisulphite)] in the mouth three times a day, keeping it into the oral cavity for one minute for 12 weeks. The patients treated with AV showed a greater reduction in pain than the placebo group. After 12 weeks, 19patients in the AV group showed complete remission, whereas 9 patients presented partial remission and 3 patients failed to respond to the treatment. In ananother recent randomized controlled trial on 40 patients to test the efficacy of AV versus Triamcinolone Acetonide ointment in the treatment of OLP. The authors concluded that AV gel was safe and effective in reducing both clinical signs and burning sensations of the lesion when compared to triamcinolone acetonide (Reddy L et al., 2016).

**Recurrent Aphthous Stomatitis**

Bhalang K et al., 2013 conducted a study to evaluate the effectiveness of Acemannan (polysaccharide) found in AV, in the treatment of oral...
aphthous ulcers. 180 subjects with recurrent aphthous ulceration randomly received one of three treatments; 0.1% Triamcinolone Acetonide, 0.5% Acemannan in Carbopol 934 and just pure Carbopol 934 (control). The authors observed that the effectiveness of Acemannan in reducing ulcer size and pain was superior to that of control but inferior to that of 0.1% triamcinolone acetonide.

n) Denture Cleanser and Adhesive

Acemannan was formulated into a denture adhesive and evaluated for adhesive strength in both wet and dry conditions; the adhesive also was used to evaluate cytotoxicity to human gingival fibroblasts. An optimal formula with a high and relatively stable adhesive bond strength and minimum cytotoxicity was observed (Mangaiyarkarasi SP et al., 2015).

VI. Routes of Administration

It is currently available in the market as an external applicator like gel, oil, face powder, face wash and toothpaste (Kumbhar PS et al., 2015; Naroor N et al., 2014).

VII. Absorption, Distribution, Metabolism and Excretion of Aloe Vera

There are no reports of studies to determine the absorption, distribution, metabolism or excretion of topically applied AV gel or whole leaf extract in experimental animals or humans (IARC Monographs, 2015). AV gel contains non-starch polysaccharides of high molecular weight (Mostly Acemannan) that are composed of sugar moieties linked by β-1, 4-glycosyl bonds. In certain ex vivo experiments, it was observed that Acemannan labelled with Fluoresceinyl Isothiocyanate (FITC) in a suspension of fresh human faeces produced metabolites for 5 days which means that Acemannan is catabolized by human intestinal bacteria (IARC Monographs, 2015; Yagi A et al., 1999).

AV latex contains the Anthrone C-Glycosides Aloin A (Barbaloin) and Aloin B (Isobarbaloin) that are linked by β-Glycosyl bonds to D-Glucopyranose. Orally ingested Anthrone C-Glycosides (i.e. aloin A and aloin B) pass unchanged through the upper gastrointestinal tract and only in the lower gastrointestinal tract these molecules are cleaved to Aloe-Emodin-9-Anthrone by human Eubacterium sp. BAR, these results were obtained in germ-free rats (IARC Monographs, 2015; Akao T et al., 1996).

VIII. Adverse Effects of Aloe Vera

a) Topical Use

It may cause redness, burning, stinging sensation and rarely generalized dermatitis in sensitive individuals. Allergic reactions are mostly due to Anthraquinones (Aloin and Barbaloin). It is best to apply it to a small area first to test for possible allergic reaction (Rajeswari R et al., 2012).

b) Systemic Use

Diarrhea, red urine, abdominal cramps, hepatitis and dependency can lead to worsening of constipation. Laxative effect may sometimes cause electrolyte imbalances (Kavashree G and Rosamma G, 2015). Verma A et al. in 2011 conducted a study with an aim to evaluate the extent of cytogenetic toxicity of the crude leaf extract of AV using the onion root tip and murine bone marrow cells. The authors stated that when onion root tip cells were exposed to the AV extract, a highly significant increase in mitotic index (MI) was observed resulting from an increase in the number of cells in prophase. However there was no increase in chromosomal abnormalities.

The mice treated with AV extract also exhibited a marked increase in the number of dividing cells (metaphases) and thus the MI of bone marrow cells increased significantly. No significant increase was observed in structural abnormalities (break and break-related abnormalities) in chromosomes but the cells with variations in chromosome number were found to increase significantly.

IX. Contraindications of Aloe Vera

1. Contraindicated in cases of known allergy to plants in the Liliaceae family (Rajeswari R et al., 2012).
2. Oral aloe is not recommended during pregnancy due to theoretical stimulation of uterine contractions and in breastfeeding mothers, it may sometimes causes gastrointestinal distress in the nursing infant (Rajeswari R et al., 2012).
3. AV should not be used in patients with intestinal obstruction or stenosis, severe dehydration with electrolyte depletion (Sahu PK et al., 2013).
4. AV should not be administered to patients with inflammatory intestinal diseases, such as appendicitis, Crohn’s disease, ulcerative colitis, irritable bowel syndrome or to children less than 10 years of age (Sahu PK et al., 2013).

X. Conclusion

The use of Aloe Vera looks very promising and must be explored further with long term studies to gain better insights. Advanced studies can be carried out to isolate individual compounds present in Aloe Vera using advanced techniques like High Pressure Liquid Chromatography. The emphasis is to find out the beneficial active constituents in Aloe Vera and their pharmacological actions in order to use them accurately in medical formulations.

Source of funding or financial interest

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Oral Health Status in India- Where do We Stand?

By Dr. L S Sreela, Dr. Anita Balan & Dr. Admaja K Nair

Abstract- Oral health is an imperative part of general health. Moreover, dental diseases are easily preventable to a huge extent. In India, dental diseases, particularly caries and periodontal disease as well as oral cancer, still continues to be widespread in the population. Only two large scale Oral Health Surveys were conducted in the country till now: (i) National Oral Health Survey & Fluoride Mapping by Dental Council of India in 2003 and (ii) Oral Health in India: Report of multi-centric oral health survey by Ministry of Health and Family Welfare in collaboration with Dental Department AIIMS in 2005. This article highlights the desperate necessity of a nationwide oral health survey for proper identification and correction of real barriers in achieving good oral health for the population.

Keywords: oral health status, national health survey, india.

GJMR-J Classification: NLMC Code: WU 113

Strictly as per the compliance and regulations of:
Oral Health Status in India- Where do We Stand?

Dr. L S Sreela a, Dr. Anita Balan a & Dr. Admaja K Nair b

Abstract- Oral health is an imperative part of general health. Moreover, dental diseases are easily preventable to a huge extent. In India, dental diseases, particularly caries and periodontal disease as well as oral cancer, still continue to be widespread in the population. Only two large scale Oral Health Surveys were conducted in the country till now: (i) National Oral Health Survey & Fluoride Mapping by Dental Council of India in 2003 and (ii) Oral Health in India: Report of multicentric oral health survey by Ministry of Health and Family Welfare in collaboration with Dental Council AllMS in 2005. This article highlights the desperate necessity of a nationwide oral health survey for proper identification and correction of real barriers in achieving good oral health for the population.

Keywords: oral health status, national health survey, india.

Key message: In India, there is a crucial need for conducting a proper national oral health survey so that there will be evaluation of present dental needs of the whole population which will enable in framing an apt National Oral Health policy.

I. INTRODUCTION

India is one in all the world’s oldest civilizations and one of the most inhabited countries in the world. According to the census reports of Indian Census 2011, the population of India is 1,210,854,977 with 623,724,248 males and 586,469,174 females. The density of population is 382 persons/sq.km. In regards to sex ratio, at present, there are 940 females on average on per 1000 males, and the child sex ratio is 914 females per 1000 males.[1] In the Health sector, India has created monumental strides over the past decades. The average life expectancy is around 67.9 years, infant and under-five mortality rates are declining as is the rate of disease incidence.[2] Several diseases, such as polio, guinea worm illness and tetanus, have been efficaciously eradicated. In spite of all the progress within the field of health, still, there are several communicable and noncommunicable diseases posing a constant threat to our manpower and economy.

Oral health is a vital component of general health. According to the World Health Organization fact sheet on oral health, “Oral health is essential to general health and quality of life. It is a state of being free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual’s capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing.”[3] Oral diseases are also associated with non-communicable diseases (NCD) like diabetes, cardiovascular diseases, cancers, and respiratory diseases.[4] Majority of the population is even unaware regarding the preventive aspects of dental problems like dental caries, periodontal diseases or oral cancer.

II. GLOBAL STATUS OF ORAL HEALTH

The WHO has established a Global Oral Health Data Bank in 1967 and is continuing persistent efforts to maintain surveillance in oral health. It is essential to have regional epidemiological data based on standard protocol for facilitating international comparison. WHO encourages to conduct clinical oral health surveys in every 5-6 years in the same community or setting, and for comparison between countries, certain indicator age groups are suggested: 5-6 years, 12 years, 15 years, 35-44 years and 65 years or more (or 65-74 years). To ensure data of high validity and reliability, standard criteria including use of basic instruments and record forms for recording clinical conditions are recommended. The survey protocol focuses on dentition status, prosthetic status and needs, dental caries and dental treatment needs, developmental anomalies of teeth, periodontal disease and treatment needs, oral mucosal lesions and oral precancer or cancer.[5]

There has been minimal progress regarding country wide oral health surveys in poorly developed or developing countries like that of Africa. In a couple of nations in Asia, customary overviews for the assessment of public health initiatives have been embraced. In Thailand, the Ministry of Health has led regular surveys every 5 years since 1984. Regardless of the numerous dental awareness programs, improper life style as well as die try habits continues to depreciate oral health, particularly in young children.[6] The Global Burden of Disease (GBD) Study 2016 estimated that oral diseases affected half of the world’s population (3.58 billion people) with dental caries in permanent teeth being the most prevalent condition assessed whereas periodontal disease, was estimated to be the 11th most prevalent
disease globally. In some Asian-Pacific countries, the incidence of oral cancer is within the top 3 of all cancers.[7]

III. Oral Health Status in India

a) The burden of oral diseases

There is a lack of evidence regarding recent epidemiology of dental diseases affecting the whole of Indian population and the available studies are mostly loco-regional or hospital-based. The prevalence and incidence rates of major dental diseases affecting the population is mostly based on the two large scale Oral Health Surveys conducted in the past: (i) National Oral Health Survey & Fluoride Mapping by Dental Council of India in 2003[8] and (ii) Report of multi-centric oral health survey by Ministry of Health and Family Welfare in collaboration with Dental Department AIIMS in 2005. [9]

In India dental caries (with a prevalence rate of 50-84.7% among index age groups), appear to be the major dental problem affecting the population followed by periodontal diseases (prevalence rate 55.4-79.4%).[8] Balaji et al. reviewed the 2016 level India-specific dental disease data using the GBD approach and compared the same with the South Asian-level data. For every 100,000 Indians males 31,489 have prevalence of dental caries where as among females, it is 34,426 for every 100000. Nearly one third of the population suffers from dental caries that require treatment.[7,10] The unmet need for dental caries or periodontal pathologies is not still clearly defined. The age standardized the incidence of oral cancer in India is 12.6 per 100,000 population.[6] In spite of significant awareness campaigns and cessation programs, more than 28% of the population still uses any forms of tobacco, which are strongly associated with oral mucosal premalignant lesions and neoplasms.[11]

b) Barriers to improvement of oral health status in India

In India, the dental manpower to population proportion is low. WHO estimates the ideal dentist: population ratio as about 1:7500. In India, it was 1:30000 in 2004 which improved to 1:10000 in 2014. Even though there is short a lack of dentists based on this ratio, the main reason for lack of adequate dental care to the population is the inequality in the distribution of dentists across the country. [12] As per recent data from Dental Council of India, there are about 1.5 lakh registered dentists for a population of about 1.3 billion, out of which 72% live in villages which remain deprived of dental care.[13] Majority of the public (government) dental health-care setups are poorly equipped, understaffed, and oral health is not a priority in budgetary allocations. Not even 20% of the rural primary healthcare centers (PHCs) around the country have a dentist or a DPH professional.[14] The National Oral Health Survey 2003 was able to cover only 19 states/union territories even though it was originally planned to cover all states/union territories in India. However, this was not achieved as some of the state authorities, such as the North Eastern States, had expressed their inability to participate due to lack of dental colleges and related resource deficiencies in their states. The general public often does not appreciate the importance of oral health, perceives it as independent from and secondary to general health. Many public health policy makers do not understand or value oral health as part of general health care, thus sidelining oral health to a policy of lower priority. Because of their economic status, under privileged or those with compromised socio economic status are unable to pay for oral health care services. Dental health insurance is of much importance in most of the developed nations. However, in India, it is still in its nascent stage with very few insurance companies providing the service.[15]

IV. Strategies to Improve Oral Health Status

It is clear from the above discussion that India strongly needs an oral health policy that is formulated on basis of the discussed aspects. Like in developed and few developing countries, oral health must be included in family health policies. The Government should implement new programs focusing on preventive, curative, and educational oral health, integrated into the existing system utilizing government and private health and educational infrastructure in both rural as well as urban areas with equal importance. Moreover, parental approaches toward the importance of oral hygiene, plays a key role in the preservation of children's dental health. Provision of oral health education to parents through health workers or teachers is essential to raise their awareness regarding the importance of oral health. More systematic studies focusing on public attitude toward oral health care is desirable. The identification of geographical areas or population with high requirement or inaccessibility of oral health status and dental treatment needs will be possible only by conducting a nationwide oral health survey which is the utmost need of the hour. Then only a population beneficial national oral health policy be able to be implemented successfully.

V. Conclusion

Oral diseases are highly prevalent in our population, and there is an urgent need to combat them. The rapid growth of dental education institutions has not helped the Indian public health system as a whole. Moreover, in a diverse country like India, there is wide variation in the distribution of dental diseases as well as treatment needs across the different states. Estimation of dental diseases and their demographic characterization would help the administration to frame successful policies for oral health. Optimizing the
provision of general and specialty dental services both under private and public sectors, is essential in the present scenario. A rough statistics point out the dentist population ratio is something like 1:5000, which is much above WHO recommendations. The system fails to provide specialty care to the needy. To conclude, there is a crucial need for conducting a systematic national oral health survey to evaluate present dental needs of population, which will facilitate in drafting a proper National Oral Health policy to extend good professional care to all.

**References**

11. GATS2 (Global Adult Tobacco Survey) Fact Sheet, India, 2016-17 :4.
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11. **Pick a good study spot**: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. **Know what you know**: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. **Use good grammar**: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. **Arrangement of information**: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. **Never start at the last minute**: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. **Multitasking in research is not good**: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. **Never copy others’ work**: Never copy others’ work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. **Go to seminars**: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. **Refresh your mind after intervals**: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.
20. **Think technically:** Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. **Adding unnecessary information:** Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. **Report concluded results:** Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. **Upon conclusion:** Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium through which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

**Informal Guidelines of Research Paper Writing**

**Key points to remember:**
- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

**Final points:**

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

**The introduction:** This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

**The discussion section:**

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

**General style:**

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

**To make a paper clear:** Adhere to recommended page limits.
Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract:

This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

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The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

*Materials may be reported in part of a section or else they may be recognized along with your measures.*

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.
Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

**Approach:**

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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**The Administration Rules**

Administration Rules to Be Strictly Followed before Submitting Your Research Paper to Global Journals Inc.

*Please read the following rules and regulations carefully before submitting your research paper to Global Journals Inc. to avoid rejection.*

**Segment draft and final research paper:** You have to strictly follow the template of a research paper, failing which your paper may get rejected. You are expected to write each part of the paper wholly on your own. The peer reviewers need to identify your own perspective of the concepts in your own terms. Please do not extract straight from any other source, and do not rephrase someone else's analysis. Do not allow anyone else to proofread your manuscript.

**Written material:** You may discuss this with your guides and key sources. Do not copy anyone else's paper, even if this is only imitation, otherwise it will be rejected on the grounds of plagiarism, which is illegal. Various methods to avoid plagiarism are strictly applied by us to every paper, and, if found guilty, you may be blacklisted, which could affect your career adversely. To guard yourself and others from possible illegal use, please do not permit anyone to use or even read your paper and file.
**CRITERION FOR GRADING A RESEARCH PAPER (COMPILATION)**

**BY GLOBAL JOURNALS**

Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals.

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