International Journal of Early Childhood Special Education (INT-JECSE)
DOI:10.9756/INTJECSE/V14I5.612 ISSN: 1308-5581 Vol 14, Issue 05 2022

Incidence of mandibular fracture among patients visiting Saveetha dental college.

- **Ushanthika T**

Undergraduate Saveetha Dental College and Hospitals,Saveetha Institute of Medical and Technical Science, Saveetha University, Chennai.

- **Vinod krishna Krishnaswamy**

Associate Professor, Saveetha Oral Cancer Institute,Department of Oral and maxillofacial surgery,Saveetha Dental College and Hospitals,Saveetha Institute of Medical and Technical Sciences [SIMATS],Saveetha UniversityChennai - 600077,
Tamil Nadu, India.

- **Senthil Murugan Pandurangan**

Associate Professor,Department of Oral and maxillofacial surgery,Saveetha Dental College and Hospitals,Saveetha Institute of Medical and Technical Sciences [SIMATS],Saveetha University Chennai - 600077,Tamil Nadu, India.

ABSTRACT:
INTRODUCTION: Mandible is the only mobile bone of the facial skeleton and there has been a significant increase in the number of cases in recent years. It is embryologically a membrane bone and is more commonly fractured than the other bones of the face.
AIM OF THE STUDY: The aim of the present study was to find the incidence of mandibular fracture and its pattern among out-patients in Saveetha dental college.
METHODOLOGY:A Retrospective analysis of all the cases with mandibular fracture among out-patients was retrieved among the overall data of patients visiting Saveetha Dental College from June 2019-March 2020. The data for 136 patients with mandibular fracture was entered in Excel Spreadsheets. And the collected data was analysed using SPSS software version 19. Chi square test was used to statistically evaluate the results.
RESULTS: Within the limitations of the current study, among 136 patients it was found that age group 21-30 group was the most common age group for mandibular fracture and the most common site was the parasymphysis followed by the condyle also number of males with fractures was seen to be higher. It was found to be statistically significant.
CONCLUSION: Within the limitations of the current study, it was found that the most common site for fractures is parasymphysis and coronoid. The incidence of occurrence will be helpful for the government agencies and health care professionals towards planning future programmes on prevention

KEYWORDS: Mandibular fracture, incidence, age, outpatients, gender, innovative

INTRODUCTION:

The fracture is defined as “disruption in the continuity of bone” (1). The first description of mandible fractures was as early as 1650 BC (2), when an Egyptian papyrus described the examination, diagnosis, and treatment of them. Many patients were either not treated properly or received no treatment at all and subsequently died. Facial area is one of the most frequently injured areas of the body, accounting for 23–97% of all facial fractures (3).Mandibular fractures occur twice as often as midfacial fractures (4). All over the world, maxillofacial injuries have continued to intrigue researchers because of the functional and cosmetic deformities that the affected individuals have to contend with.

The variety of anatomic involvement, mechanisms, and forms of injury present challenges to even the most experienced trauma surgeon (5). Bone fractures at site of tensile strain, since their resis- tance to compressive forces is greater (6). Areas that exhibit weakness include the area lateral to the mental protuberance, mental foramen, mandibular angle, and the condylar neck (7). They may occur alone or in combination with other facial injuries (8). The thickening on the inner aspect of the condylar neck or crest of the neck apparently acts as a main buttress of the mandible as it transmits pressure to the TMJ and the base of the skull.

Social problems of illiteracy, interpersonal violence, deteriorating infrastructure such as bad roads; driving under the influence of alcohol; and non-compliance with crash helmet and seat belt legislation along with increased volume of traffic have contributed to the traumatic facial injuries in the studied population group. Road traffic accidents is the leading cause of mandibular fracture in developing countries owing to poor enforcement of law and ensuring the abidance by the existing traffic and speed limit regulations, while interpersonal violence is the leading cause in developed countries (9).

Age and sex have been cited as important factors that influence the occurrence of mandibular fractures. The large variability in reported prevalence is due to a variety of contributing factors, such as the sex, age, environment and socio-economic status of the patient, as well as the mechanism of injury. For each patient, the combination of these factors determines the likelihood of a mandibular fracture. A clearer understanding of the demographic patterns of mandibular fractures will assist health care providers as they plan and manage the treatment of traumatic maxillofacial injuries. Such epidemiological information can also be used to guide the future funding of public health programs geared toward prevention. Our team has extensive knowledge and research experience that has translate into high quality publications (10),(11),(12),(13),(14–23)(24),(25–27).(28,29). The aims of this retrospective analysis were to determine the incidence and pattern of mandibular fractures; to determine the age group in which injury occurred most often among the outpatients from Saveetha dental college.

MATERIALS AND METHODS:

Study design - Retrospective study.

Study population

A retrospective study was carried out among young adults reporting to Saveetha Dental College and Hospital.The study was conducted between June 2020-March 2021. The study population consisted of patients who reported mandibular fracture.

Ethical approval

Ethical approval was obtained from the Institutional Ethical Committee and Scientific Review Board (SRB) of Saveetha Dental College.

Data collection

The data were collected by analyzing the records of 86,000 patients between June 2019-March 2020 The data comprised 136 patients who reported with mandibular fracture. The data includes the patient's details, OPG and site of fracture.

Data analysis

The collected data were entered in an Excel sheet and subjected to statistical analysis using SPSS software. Chi square tests were done between age, gender and site of mandibular fracture and region of fracture. The independent variables were patient name and PID while dependent variables were site of fracture, age and gender. The level of significance is $p<0.05$.

RESULTS AND DISCUSSION:

In the present study, the patients from the 10-20 age group was 21.48%, 21-30 age group was 37.78%, 34.81% were from 31-50 age group and 5.93% of the patients were from the 51-70 age group. The highest number of patients were from the 21-30 age group. The incidence of mandibular fractures according to the study by Kolli Yada Giri et al study found that the majority of the reported cases fall between the age group 21–30 years (3rd decade, 35.4%) followed by 2nd (22.2%) and 4th decade (20.8%) which coincided with our study. Age group of 21–30 years showed a higher frequency of fractures. This is consistent with other study reports.

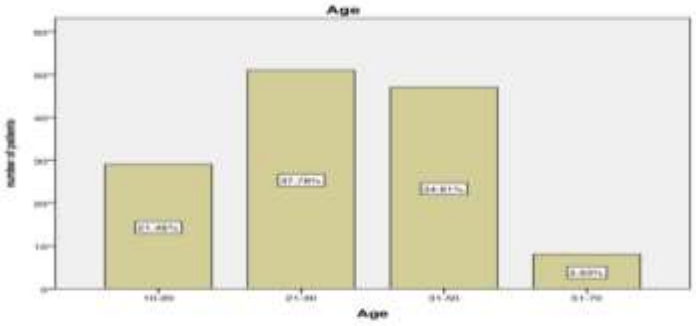

Figure 1: Depicts the distribution of age population in the current study the patients from the 10-20 age group was 21.48%, 21-30 age group was 37.78%, 34.81% were from 31-50 age group and 5.93% of the patients were from the 51-70 age group.

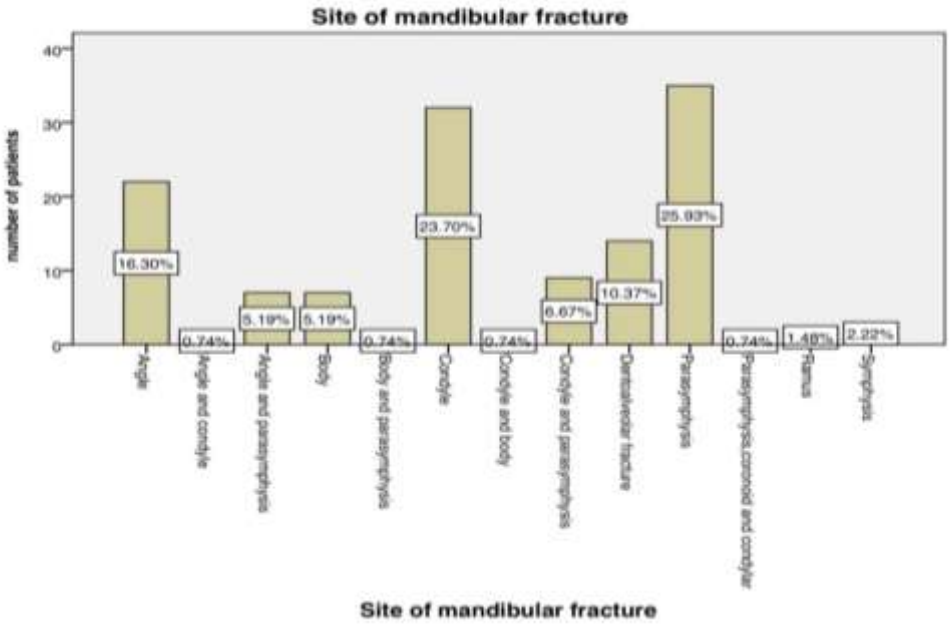

Figure 2: Depicts the distribution of the site of mandibular fractures.

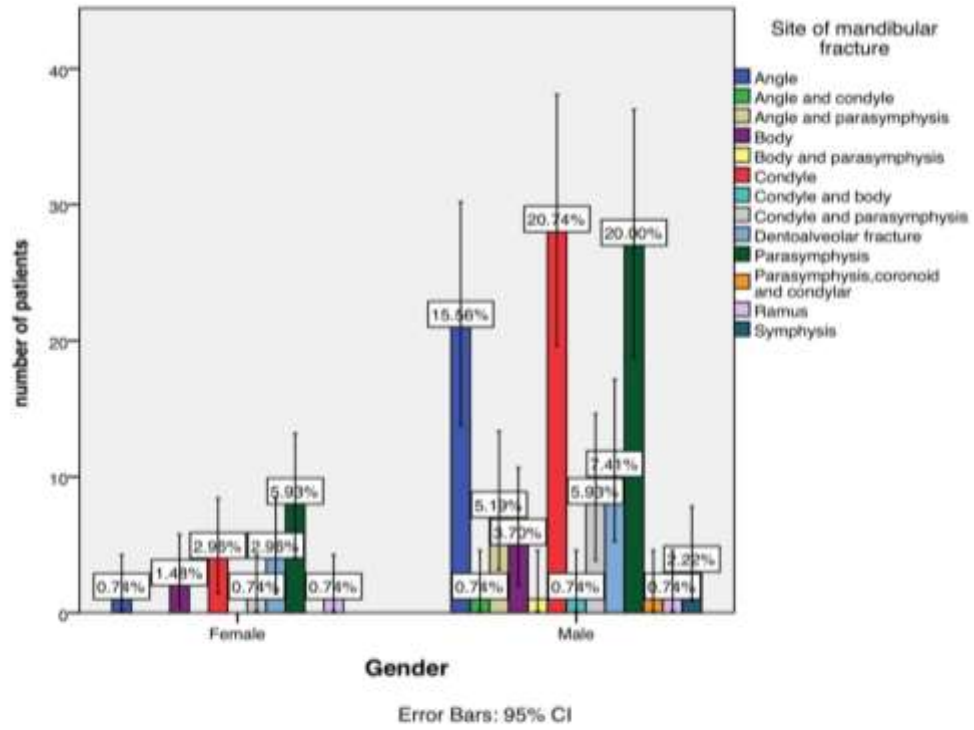

Figure 3: This graph represents the association between gender and site of mandibular fractures among the study population. X axis represents the gender of patients and the Y axis represents the site of mandibular fractures. It was seen that there were more number of male patients and the most common site was condyle followed by parasymphysis. Chi square test was done (pvalue= 0.395), and it was not significant. Proving that there is no significant association between gender and site of mandibular fractures.

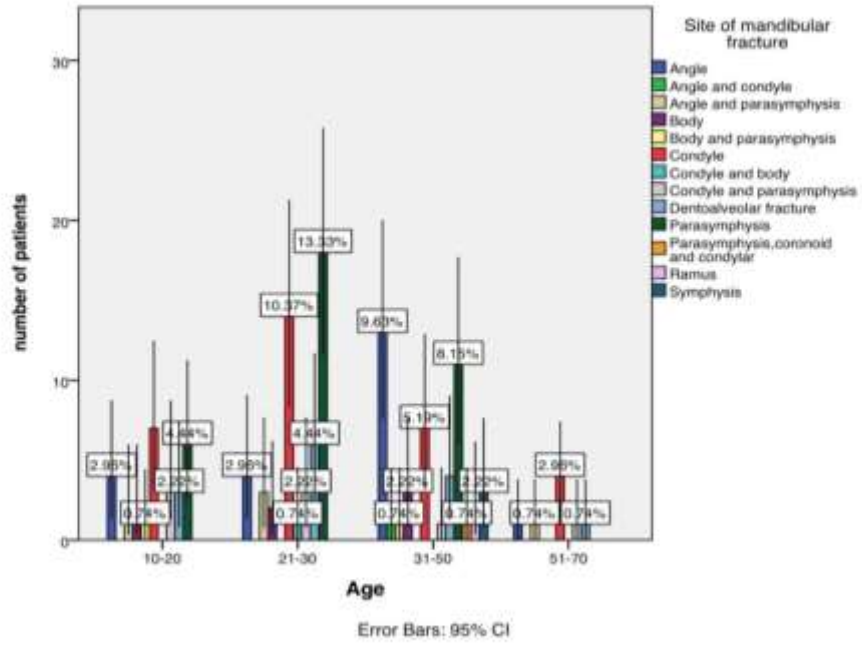

Figure 4: This graph represents the association between age and site of mandibular fractures among the study population. X axis represents the age of patients and the Y axis represents the site of mandibular fractures. It was seen that the majority of patients were from the age group 21-30 and the most common site was parasymphysis. Chi square test was done (pvalue= 0.188), and it was not significant. Proving that there is no significant association between age and site of mandibular fractures.

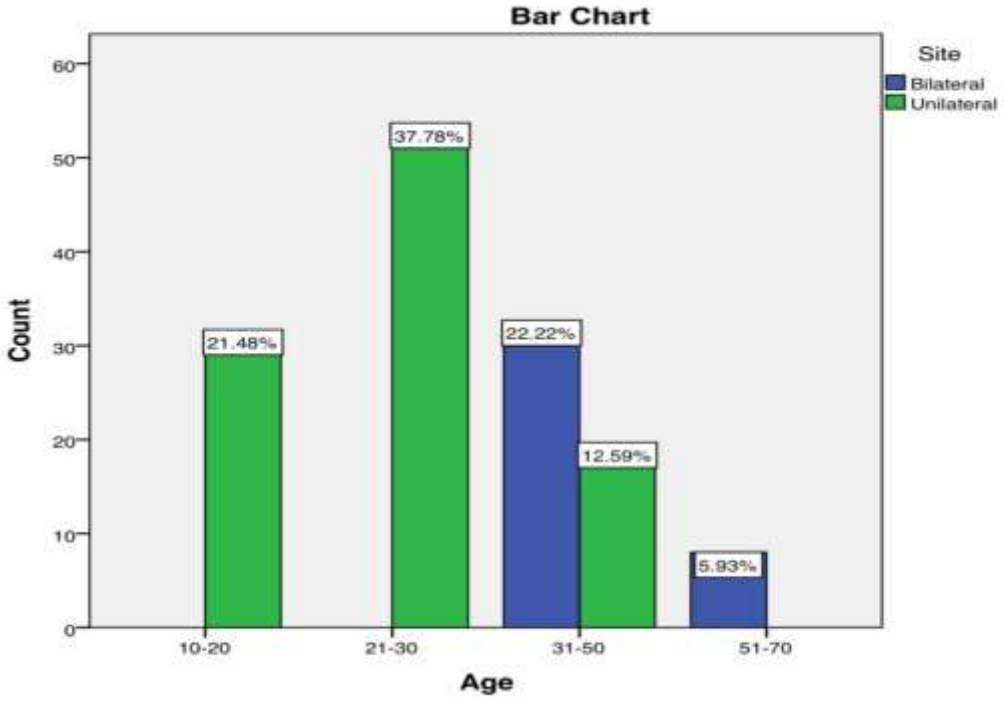

Figure 5: This graph represents the association between site and age. X axis represents the age of patients and Y axis represents the site. It was seen that the majority of patients from the age group 21-30 had unilateral fracture and 31-50 group had more bilateral fractures (green). Chi square test was done (pvalue= 0.000), and it was significant. Proving that there is significant association between site and age.

As per our results, the highest percent were patients from the 21-30 age group was 37.78% and the least was 5.93% patients from the 51-70 age group. According to previous literature (30), it reveals that right sided mandibular fractures are caused in comparison to left sided fractures and right side angle fractures are more prominent. Also, male predominance is more as permost studies and the correlation between gender and age in our study holds significance.

Our study shows that the majority of patients were males, from the age group 21-30 and the most common site was parasymphysis. A similar study (31), states that fractures in the mandible are most often occurring in the angle, condylar and parasymphysis regions which are considered to be weaks areas of the mandible. Several factors such as musculature of the face, presence or absence of impacted third molars and structure of mandible provides for the risk of angle fracture. There are not my studies correlating to female predilection in such cases.

It was seen that the majority of patients (37.78%) from the age group 21-30 had unilateral fracture and 31-50 group (12.59%) had more bilateral fractures.
Recent scientific progression shows that right sided mandibular fractures are more prominent compared to left sided fractures. However, the opposite is because most of the people are right handed which tends to hurt the left side of the victim during aggressive actions or behaviour.

CONCLUSION

Within the limitations of the current study, it was found that the age group 21-30 group was the most common age group for mandibular fracture and the most common site was the parasymphysis followed by the condyle also number of males with fractures was seen to be higher. To reduce the incidence of road traffic accidents, precautions like seat belts, speed limits, improvement in condition of road, encouraging the young adult population not to consume alcohol and drugs while driving and strict traffic rules may help to reduce maxillofacial trauma and mandible fracture. Maxillofacial trauma may coexist with other injuries and conversely injuries elsewhere may exist in patients with maxillofacial trauma. So it is necessary for the maxillofacial surgeon to be a part of a multidisciplinary trauma team. Furthermore, the results of our data will be helpful for the government agencies and health care professionals towards planning future programmes on prevention.

Limitation

The main of this study is limited sample size and confined to a single source for data. Further descriptive studies on a larger scale can help us to give comprehensive data for arriving at a conclusion and to plan health oral health programs for the population studied.

ACKNOWLEDGEMENT

The authors sincerely acknowledge the faculty Medical record department and Information technology department of SIMATS for their tireless help in sorting out datas pertinent to this study.

AUTHORS CONTRIBUTION

Ushanthika T: Literature search, data collection, data analysis, manuscript writing.
Dr.Vinodh Krishna : Study design, data verification, manuscript drafting.

CONFLICT OF INTEREST

The authors declare that there were no conflicts of interest in the present study.

SOURCE OF FUNDING

The present project is supported by SOMA Beverages.

- Saveetha Dental College and Hospitals
- Saveetha Institute of Medical and Technical Science
- Saveetha University

REFERENCE:

1. Malik N. Introduction to Oral and Maxillofacial Surgery [Internet]. Textbook of Oral and Maxillofacial Surgery. 2016. p. 1–1. Available from: http://dx.doi.org/10.5005/jp/books/12910_2
2. Breasted JH. The Edwin Smith surgical papyrus: published in facsimile and hieroglyphic transliteration with translation and commentary in two volumes. 1930 [cited 2021 Sep 20]; Available from: https://ixtheo.de/Record/1076082262
3. Edwards TJ, David DJ, Simpson DA, Abbott AA. Patterns of mandibular fractures in Adelaide, South Australia. Aust N Z J Surg. 1994 May;64(5):307–11.
4. Rattan V, Sethi A. Arteriovenous malformation of the mandible: successful management by buccal window approach [Internet]. Vol. 48, British Journal of Oral and Maxillofacial Surgery. 2010. p. e31–3. Available from: http://dx.doi.org/10.1016/j.bjoms.2010.06.009
5. Ghanizadeh M. Comparison of Pain Relief between Preoperative Administration of Intravenous Ketorolac and Oral

Pregabalin in Patients Undergoing Surgery for Mandibular Fracture: A Randomized Clinical Trial [Internet]. Tabriz University of Medical Sciences, School of Dentistry; 2020. Available from: http://80.191.203.9/xmlui/handle/123456789/63039
6. Halazonetis JA. The "weak" regions of the mandible. Br J Oral Surg. 1968 Jul 1;6(1):37–48.
7. Hodgson VR. Tolerance of the facial bones to impact. Am J Anat. 1967 Jan;120(1):113–22.
8. Muzaffar K. Management of maxillofacial trauma. AFID Dent J. 1998;10:18–21.
9. Erdmann D, Follmar KE, Debruijn M, Bruno AD, Jung S-H, Edelman D, et al. A retrospective analysis of facial fracture etiologies. Ann Plast Surg. 2008 Apr;60(4):398–403.
10. J PC, Pradeep CJ, Marimuthu T, Krithika C, Devadoss P, Kumar SM. Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study [Internet]. Vol. 20, Clinical Implant Dentistry and Related Research. 2018. p. 531–4. Available from: http://dx.doi.org/10.1111/cid.12609
11. Wahab PUA, Abdul Wahab PU, Madhulaxmi M, Senthilnathan P, Muthusekhar MR, Vohra Y, et al. Scalpel Versus Diathermy in Wound Healing After Mucosal Incisions: A Split-Mouth Study [Internet]. Vol. 76, Journal of Oral and Maxillofacial Surgery. 2018. p. 1160–4. Available from: http://dx.doi.org/10.1016/j.joms.2017.12.020
12. Mudigonda SK, Murugan S, Velavan K, Thulasiraman S, Krishna Kumar Raja VB. Non-suturing microvascular anastomosis in maxillofacial reconstruction- a comparative study. Journal of Cranio-Maxillofacial Surgery. 2020 Jun 1;48(6):599–606.
13. Narayanasamy RK, Muthusekar RM, Nagalingam SP, Thyagarajan S, Ramakrishnan B, Perumal K. Lower pretreatment hemoglobin status and treatment breaks in locally advanced head and neck squamous cell carcinoma during concurrent chemoradiation. Indian J Cancer. 2021 Jan;58(1):62–8.
14. Wang H, Chinnathambi A, Alahmadi TA, Alharbi SA, Veeraraghavan VP, Krishna Mohan S, et al. Phyllanthin inhibits MOLT-4 leukemic cancer cell growth and induces apoptosis through the inhibition of AKT and JNK signaling pathway. J Biochem Mol Toxicol. 2021 Jun;35(6):1–10.
15. Li S, Zhang Y, Veeraraghavan VP, Mohan SK, Ma Y. Restorative Effect of Fucoxanthin in an Ovalbumin-Induced Allergic Rhinitis Animal Model through NF-κB p65 and STAT3 Signaling. J Environ Pathol Toxicol Oncol. 2019;38(4):365–75.
16. Ma Y, Karunakaran T, Veeraraghavan VP, Mohan SK, Li S. Sesame Inhibits Cell Proliferation and Induces Apoptosis through Inhibition of STAT-3 Translocation in Thyroid Cancer Cell Lines (FTC-133). Biotechnol Bioprocess Eng. 2019 Aug 1;24(4):646–52.
17. Bishir M, Bhat A, Essa MM, Ekpo O, Ihunwo AO, Veeraraghavan VP, et al. Sleep Deprivation and Neurological Disorders. Biomed Res Int. 2020 Nov 23;2020:5764017.
18. Fan Y, Maghimaa M, Chinnathambi A, Alharbi SA, Veeraraghavan VP, Mohan SK, et al. Tomentosin Reduces Behavior Deficits and Neuroinflammatory Response in MPTP-Induced Parkinson's Disease in Mice. J Environ Pathol Toxicol Oncol. 2021;40(1):75–84.
19. Zhang C, Chen Y, Zhang M, Xu C, Gong G, Veeraraghavan VP, et al. Vicenin-2 Treatment Attenuated the Diethylnitrosamine-Induced Liver Carcinoma and Oxidative Stress through Increased Apoptotic Protein Expression in Experimental Rats. J Environ Pathol Toxicol Oncol. 2020;39(2):113–23.
20. Gan H, Zhang Y, Zhou Q, Zheng L, Xie X, Veeraraghavan VP, et al. Zingerone induced caspase-dependent apoptosis in MCF-7 cells and prevents 7,12-dimethylbenz(a)anthracene-induced mammary carcinogenesis in experimental rats. J Biochem Mol Toxicol. 2019 Oct;33(10):e22387.
21. Saravanakumar K, Park S, Mariadoss AVA, Sathiyaseelan A, Veeraraghavan VP, Kim S, et al. Chemical composition, antioxidant, and anti-diabetic activities of ethyl acetate fraction of Stachys riederi var. japonica (Miq.) in streptozotocin-induced type 2 diabetic mice. Food Chem Toxicol. 2021 Jun 26;155:112374.
22. Veeraraghavan VP, Hussain S, Papayya Balakrishna J, Dhawale L, Kullappan M, Mallavarapu Ambrose J, et al. A Comprehensive and Critical Review on Ethnopharmacological Importance of Desert Truffles: Terfezia claveryi, Terfezia boudieri, and Tirmania nivea. Food Rev Int. 2021 Feb 24;1–20.
23. Wei W, Li R, Liu Q, Devanathadesikan Seshadri V, Veeraraghavan VP, Surapaneni KM, et al. Amelioration of oxidative stress, inflammation and tumor promotion by Tin oxide-Sodium alginate-Polyethylene glycol-Allyl isothiocyanate nanocomposites on the 1,2-Dimethylhydrazine induced colon carcinogenesis in rats. Arabian Journal of Chemistry. 2021 Aug 1;14(8):103238.
24. Sathya S, Ragul V, Veeraraghavan VP, Singh L, Niyas Ahamed MI. An in vitro study on hexavalent chromium [Cr(VI)] remediation using iron oxide nanoparticles based beads. Environmental Nanotechnology, Monitoring & Management. 2020 Dec 1;14:100333.
25. Chandrasekar R, Chandrasekhar S, Sundari KKS, Ravi P. Development and validation of a formula for objective assessment of cervical vertebral bone age. Prog Orthod. 2020 Oct 12;21(1):38.
26. Ramakrishnan M, Dhanalakshmi R, Subramanian EMG. Survival rate of different fixed posterior space maintainers used in Paediatric Dentistry – A systematic review [Internet]. Vol. 31, The Saudi Dental Journal. 2019. p. 165–72. Available from: http://dx.doi.org/10.1016/j.sdentj.2019.02.037
27. Felicita AS, Sumathi Felicita A. Orthodontic extrusion of Ellis Class VIII fracture of maxillary lateral incisor – The sling shot method [Internet]. Vol. 30, The Saudi Dental Journal. 2018. p. 265–9. Available from: http://dx.doi.org/10.1016/j.sdentj.2018.05.001

28. Su P, Veeraraghavan VP, Krishna Mohan S, Lu W. A ginger derivative, zingerone-a phenolic compound-induces ROS-mediated apoptosis in colon cancer cells (HCT-116). J Biochem Mol Toxicol. 2019 Dec;33(12):e22403.
29. Wan J, Feng Y, Du L, Veeraraghavan VP, Mohan SK, Guo S. Antiatherosclerotic Activity of Eriocitrin in High-Fat-Diet-Induced Atherosclerosis Model Rats. J Environ Pathol Toxicol Oncol. 2020;39(1):61–75.
30. Natu SS, Pradhan H, Gupta H, Alam S, Gupta S, Pradhan R, et al. An epidemiological study on pattern and incidence of mandibular fractures. Plast Surg Int. 2012 Nov 8;2012:834364.
31. Barde D, Mudhol A, Madan R. Prevalence and pattern of mandibular fracture in Central India. Natl J Maxillofac Surg. 2014 Jul;5(2):153–6.
32. SIVARANJANI, SS, et al. "Single Immediate Denture for a Diabetic Patient-A Case Report." *International Journal of Dental Research & Development (IJDRD) 6.6 (2016) 17* 22 (2016).
33. Prabhu, Nayana, Nithesh Naik, and Vathsala Patil. "A study on effect of geometric patterns and material onstress distribution in dental implant system: a 3-dimensional finite element analysis." *International Journal of Mechanical and Production* 9 (2020): 743-752.
34. Ramadurai, K., V. Sathan Raj, and R. Vinoth. "Analysis of wear and sem characteristics on ferrous composites through powder metallurgy method." *International Journal of Mechanical and Production Engineering Research and Development (IJMPERD* 8.4 (2018): 609-614.
35. Patil, Vathsala, et al. "A comparative study on the effect of stress in dental implant structure using finite element analysis." *Int J Mech Prod Eng Res Dev* 9 (2019): 709-17.
36. Shinde, Tushar, Aditi Dhage, and Aishwarya Das. "Intentional Reimplantation: Salvaging Endeavour." *International Journal of Dental Research & Development (IJDRD)* 6.3 (2016).
37. Kumari, P. U. R. N. I. M. A., et al. "In vitro callus production and anti-bacterial activity of Barleria prionitis Linn. against dental caries pathogens." *Int. J. Bot. Res* 3.4 (2013): 1-6.