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## Tobacco Cessation During The COVID-19 Pandemic: Is This the Right Time?

SUMEDHA KUSHWAHA 

The COVID 19 pandemic came as a blow to the humanity, human life and existing concepts of medical and social sciences. Various fields of medicine got a new purpose, especially public health. The pandemic has made us understand so many perspectives about physical, mental and social/public health. All health professionals working currently to fight this are in broad perspectives public health workers!

The novel Coronavirus (2019-nCoV, officially known as SARS-CoV-2 or COVID-19) was first reported in December 2019, as a cluster of acute respiratory illness in Wuhan, Hubei Province, China, from where it spread rapidly to over 198 countries. It was declared as a global pandemic by World Health Organization (WHO) on 12th March 2020.<sup>1,2</sup> The studies of its various effects on different organs, mechanism of action, new strains, virulence, long term side effects will continue to be a research subject for years to come.

The interesting aspects of an already existing menace- tobacco and the use of its effects on COVID 19's initiation, progression and prognosis are worth researching as well. India is the third largest tobacco producing nation and second largest consumer of tobacco world-wide.<sup>3</sup> According to World Health Organization (WHO), six million deaths are attributable to tobacco use globally, of which nearly 1.2 million occur in South-East Asia.<sup>4</sup> Global Adult Tobacco Survey-2 revealed that 266.8 million adults in India, aged 15 and above currently use tobacco in some form. There are an estimated 99.5 million people who smoke tobacco and 199.4 million who use smokeless tobacco.<sup>3</sup>

According to the World Health Organization (WHO), current evidence suggests that the severity of COVID-19 disease is higher among smokers. Smoking (in any form) impairs lung function, making it more difficult for the body to fight off respiratory

disease due to the new coronavirus. Tobacco users have a higher risk of being infected with the virus through the mouth while smoking cigarettes or using other tobacco products. If smokers contract the COVID-19 virus, they face a greater risk of getting a severe infection as their lung health is already compromised.<sup>5</sup> Using smokeless tobacco often involves some hand to mouth contact. Another risk associated with using smokeless tobacco products, like chewing tobacco, is that the virus can be spread when the user spits out the excess saliva produced during the chewing process.<sup>6</sup> Thus tobacco in any form, either smoking or smokeless poses greater danger to COVID-19 patients and also susceptibility of transmitting it to other.

According to the GATS, 2nd round- Interestingly 8.6% of the 38.5% smokers and 7.3% of the 33.2% users of smokeless tobacco who tried to quit sought help through counselling/advice that includes cessation clinic and a telephone Quitline/help line.<sup>3</sup> These facts bring to light the need for strengthened and robust healthcare delivery system for tobacco cessation counselling and treatment that can cater to such a large number of patients.

However, apart from the dwindling doctor patient ratio in India<sup>7</sup>, literature review also suggests that lack of time, knowledge, training, confidence, fear of losing patients during treatment and inadequate availability of health education materials are some factors that deter health professionals from delivering tobacco cessation counselling.<sup>9-12</sup>

During such grave times where mobile and wireless technology has acted like a saviour. For health based problems; where counselling is required and a constant follow-up with patients is required; technology can be both an enabler as well as a solution to achieve such major health objectives. Efficient use of technology can change the face of health care delivery systems with rapid expansion and



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growth in coverage of mobile cellular networks and mobile phone users.<sup>13</sup>

m-Cessation which has been proposed since a long time by the National Tobacco Control Program, WHO and many international organizations working in the space of tobacco control could now be used as a solution in its totality. For all doctors, dentists, nurses, health workers, social workers and other allied health professionals, it's a time for change, time to be innovative and be open to a complete change and transformation of health care delivery systems at large.

## REFERENCES

1. Eurosurveillance Editorial T. Note from the editors: World Health Organization declares novel coronavirus (2019-nCoV) sixth public health emergency of international concern. Euro surveillance : bulletin Europeen sur les maladies transmissibles = European communicable disease bulletin. 2020;25(5). Epub 2020/02/06.
2. World Health Organization. WHO announces COVID-19 outbreak a pandemic. (Online Article). Available from: <http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid19/news/news/2020/3/who-announces-covid-19-outbreak-a-pandemic> [Last accessed 12th March 2020].
3. Global Adult Tobacco Survey: Second Round India 2016-17. (Online Article). Available from: [http://cancerindia.org.in/wp-content/uploads/2018/09/GATS\\_2\\_India-Report.pdf](http://cancerindia.org.in/wp-content/uploads/2018/09/GATS_2_India-Report.pdf). [Last Accessed on 15<sup>th</sup> August, 2020]
4. Sinha DN, Palipudi KM, Gupta PC, Singhal S, Ramasundarhettige C, Jha P, et al. Smokeless tobacco use: A meta-analysis of risk and attributable mortality estimates for India. Indian J Cancer. 2014;51(S1):73-7.
5. WHO Europe. Resources for tobacco use control as part of COVID-19 response. (Online Article). Available from: <https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/technical-guidance/resources-for-tobacco-use-control-as-part-of-covid-19-response> [Last Accessed on 15th August, 2020]
6. WHO. Q&A: Tobacco and COVID-19. (Online Article). Available from: <https://www.who.int/news-room/q-a-detail/q-a-on-tobacco-and-covid-19> [Last Accessed on 15th August, 2020]
7. Deo MG. Doctor population ratio for India - the reality. Indian J Med Res. 2013;137(4):632-5.
8. Saito A, Nishina M, Murai K, et al. Health professional's perceptions of and potential barriers to smoking cessation care: a survey study at a dental school hospital in Japan. BMC Res Notes 3, 329 (2010). <https://doi.org/10.1186/1756-0500-3-329>
9. Pendharkar B, Levy SM, McQuistan MR, Qian F, Squier CA, Slach NA, et al. Fourth-Year Dental Students' Perceived Barriers to Providing Tobacco Intervention Services. J Dent Educ 2010;74(10):1074-85
10. Joshi V, Suchin V, Lim J. Smoking Cessation: Barriers, Motivators and the Role of Physicians — A Survey of Physicians and Patients. Proceedings of Singapore Healthcare. 2010; 19 (2):145-53.
11. Bhat N, Jyothirmai-Reddy J, Gohil M, Khatri M, Ladha M, Sharma M. Attitudes, Practices and Perceived Barriers in Smoking Cessation among Dentists of Udaipur City, Rajasthan, India. Addict Health. 2014; 6(1-2): 73-80.
12. Li KW, Chao D. Current practices, attitudes, and perceived barriers for treating smokers by Hong Kong dentists. Hong Kong Med J. 2014;20(2): 94-101
13. mHealth New horizons for health through mobile technologies- Global Observatory for eHealth series - Volume 3. (Online Article). Available from: [https://www.who.int/goe/publications/goe\\_mhealth\\_web.pdf](https://www.who.int/goe/publications/goe_mhealth_web.pdf). [Last Accessed on 10<sup>th</sup> September, 2020]

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## AUTHOR AFFILIATIONS:

Assistant Professor, Department of Public Health Dentistry, Regional Institute of Medical Sciences, Imphal, Manipur (ORCID ID: <https://orcid.org/0000-0001-9145-7257>)

e-mail id for correspondence: [sumedha.kushwaha90\[at\]gmail \[dot\]com](mailto:sumedha.kushwaha90[at]gmail [dot]com)

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REVIEW

# Therapies of Interest in Combatting COVID-19

CHANPRIT SINGH

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By the end of year 2019, the coronavirus infection originated in China and in a short span of time entangled the whole world. This rapidly expanding coronavirus 2019 (also called COVID-19, 2019-nCoV or SARS-CoV-2) infected around eight lac people and resulted in more than 38000 deaths worldwide by 1st April 2020. Elderly people, immunocompromised subjects and those with comorbidities were found to be affected more often. This review focuses on the current knowledge related to therapies of interest for tackling COVID-19 which include drugs with antiviral activity that have been regularly used in other diseases and other drugs which don't fall under antiviral category but are gaining popularity in the current situation for their possible and potential effectiveness against coronavirus. Although progress has been made in determining potential of these therapeutic alternatives, long term safety-efficacy studies of these agents in COVID-19 infected subjects are required.

**KEYWORDS:** Coronavirus, COVID-19, SARS-CoV-2

## INTRODUCTION

Coronaviruses are single-stranded, positive ribonucleic acid viruses, belonging to the family Coronaviridae that can cause disease in birds, mammals and humans.<sup>1</sup> In December 2019, the city of Wuhan, China, became the center of a viral outbreak that attracted great international attention. The causative agent of the disease was isolated, and it was determined to be a new coronavirus in January 2020. Following SARS-CoV (2002) and MERS-CoV (2012), this is the third coronavirus outbreak reported in the current century.<sup>2</sup>

This novel coronavirus 2019 has rapidly spread from China to almost every corner of the globe. Due to this illness, around eight lac people were infected and more than 38000 died worldwide by 1st April 2020 with United States being the country with the highest number of victims. It has been observed that the virus most frequently affects older adults, immunocompromised people or people with comorbidities.<sup>2</sup>

In this review we offer a panoramic view of the current knowledge related to the treatment and therapeutic alternatives for COVID-19, from drugs that have been regularly used in other diseases with proven antiviral activity, to drugs that have usually been used as antiparasitic or antibacterial but that, in the current situation, are again known for their possible and potential effectiveness in treating COVID-19.

Preventive administration of antibiotics should not be performed without microbiologically confirming bacterial superinfection.<sup>4</sup> There are not yet any licensed vaccines or therapeutic agents to treat coronavirus infection, highlighting the urgent need to develop effective vaccines or post-exposure prophylaxis to prevent future epidemics. COVID-19 resembles SARS-CoV infection in a few genetic, clinical and epidemiological characteristics. Therefore, advances in research on the treatment of this virus could help develop effective therapeutic agents.<sup>1</sup>

## ARBIDOL (UMIFENOVIR)

Umifenovir has been shown to have a direct antiviral effect on early viral replication of SARS-CoV in vitro.<sup>5</sup> Arbidol inhibits virus-mediated fusion with the target membrane, thereby blocking viral entry into the target cells.<sup>6</sup> This product is used as a treatment for influenza in Russia and China and has been claimed to be effective in the therapy of COVID-19 in a concentration range of 10-30  $\mu$ M, in vitro. A multicenter randomized controlled trial with arbidol has been initiated in China in patients with COVID-19.<sup>7</sup> As per the results of a study, this drug showed a trend to improve patient discharge rate and reduce mortality in a small cohort of patients with COVID-19.<sup>6</sup>

## REMDESIVIR

Remdesivir is a prophylactic analogue of adenosine which could interfere with NSP 12 polymerase, in



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vitro.<sup>8</sup>

It has been recognized as an antiviral agent with a promising potential against a wide range of RNA virus infections in animal/in-vitro studies. Furthermore, it is in stage of clinical development for the treatment of Ebola virus infection.<sup>9</sup> It was used to treat the first COVID-19 patient in USA and resulted in a reduced viral load in nasopharyngeal and oropharyngeal samples, and the patient's clinical condition improved.<sup>10,11</sup> Phase III clinical trials have also been conducted for evaluating the use of intravenous remdesivir in patients with COVID -19.<sup>12</sup>

#### **LOPINAVIR/ RITONAVIR**

The protease inhibitors lopinavir and ritonavir, used in treating HIV infection, could improve the condition of patients with SARS and MERS viral infection.<sup>8</sup> The systematic review by Yao et al. reports that most in vitro studies have shown that lopinavir can inhibit SARS-CoV. In addition, two cohort studies of SARS-CoV patients revealed that lopinavir/ritonavir plays a critical role in clinical outcome, especially in the early stage. Treatment with lopinavir/ritonavir improved clinical outcomes in some patients with MERS-CoV and this could be an effective treatment against COVID-19 based on the previous experience against SARS and MERS.<sup>13</sup> In an adult patient with COVID-19 in Korea, the viral load significantly decreased after the administration of lopinavir/ritonavir.<sup>14</sup>

As per a published protocol for the restricted use of this association in symptomatic patients during a public health emergency, adult patients hospitalized by COVID-19 were eligible to receive this combination drug for 14 days after signing the informed consent and if useful, further evaluation by a randomized control trial design is warranted for future therapeutic use of this combination.<sup>15</sup>

#### **FAVIPIRAVIR**

This drug underwent clinical trials for evaluation of efficacy and safety in the treatment of COVID-19 with promising results.<sup>16</sup> Favipiravir is a new type of RNA polymerase inhibitor<sup>17</sup> that becomes an active phosphoribosylating form in cells and is recognized as a substrate by viral RNA polymerase, thus inhibiting the activity of RNA polymerase.<sup>18</sup> The preliminary result of a clinical trial indicated that favipiravir had a more potent antiviral action than lopinavir/ritonavir. No significant drug related safety signals were

observed in the favipiravir treatment group which had significantly lower adverse reactions than the lopinavir/ritonavir group. Therefore, the favipiravir would have a possible antiviral action in COVID-19.<sup>16</sup>

#### **TEICOPLANIN**

The knowledge-based hit and trial of existing drugs can be a quick and effective way in identifying drugs with a known safety profile in treating an emerging disease. Teicoplanin, a glycopeptide used to treat gram-positive bacterial infections has been found to be active, in vitro, against SARS-CoV. It has joined the list of molecules that could be used as therapeutic arsenal in COVID-19 as it has demonstrated its efficacy against several viruses such as HIV, Ebola, flavivirus, influenza virus, hepatitis C virus, SARSCoV and MERS-CoV(19). This drug prevents the viral RNA release and interrupts the replication cycle of corona virus, so is placed as a potential treatment for patients with coronavirus infection.<sup>20,21</sup>

#### **CHLOROQUINE**

Chloroquine, an effective anti-malarial drug has been used for many years and has a great potential in treating COVID-19 infection. It can inhibit the pH-dependent steps of replication of various viruses with a potent effect on the infection and spread of SARS-CoV. In addition, this drug has immune-modulatory effects, which suppress the production and release of TNF- $\alpha$  and IL-6. Research publications have reported that this drug interferes with the glycosylation process of SARS-CoV cell receptors and also works in the entry and post-entry stages of infection in Vero E6 cells. When combined with remdesivir, has also been shown to effectively inhibit the virus in-vitro.<sup>8</sup> As per recent studies, it may improve the clinical outcome of patients infected with SARS-CoV-2. It is also assumed that chloroquine also interferes with the glycation of the ACE2 receptor, thus preventing the binding of the virus to target cells.<sup>22</sup>

As reported by Wang et al, the expression of RCT2 is increased by SARS coronavirus in lung tissue, and this may accelerate its replication as well as spread.<sup>23</sup> It also alters virion assembly and germination by interfering with proteolytic processing of M-protein and it could act indirectly by halting the production of pro-inflammatory cytokines and activating antiviral CD8+ T cells.<sup>24</sup>

It is reported that there is preclinical evidence of

efficacy-safety for long-term clinical use in other diseases that justify clinical investigation of chloroquine use in patients with COVID-19.<sup>24</sup>

### HYDROXYCHLOROQUINE

Hydroxychloroquine and chloroquine are active against malaria and have similar pharmacokinetics but differ in their toxic doses and by the presence of a hydroxyl group. The advantage of hydroxychloroquine is that it can be used in high doses for long periods with very good tolerance.<sup>22,25</sup> Both drugs have equivalent antiviral activity, but hydroxychloroquine has a better safety profile than chloroquine. In patients with COVID-19, these drugs may interact with lopinavir/ritonavir or azithromycin, resulting in prolongation of the QT interval. Other therapeutic agents for COVID-19 are currently being investigated, such as antivirals (oseltamivir, lopinavir/ritonavir or ribavirin), interferons and intravenous immunoglobulins that do not interfere with hydroxychloroquine.<sup>26</sup>

Zhou et al. propose that hydroxychloroquine, which shows an antiviral effect very similar to that of chloroquine, could serve as a better therapeutic approach. Hydroxychloroquine is likely to suppress T-cell activation, leading to inhibition of the cytokine storm and ultimately hinder the severe progression of COVID-19. In addition, it has a better safety profile and may be administered in pregnant patients.<sup>27</sup>

### AZITHROMYCIN

The antibiotic azithromycin has also gained attention during this deadly outbreak. A non-randomized, open-label clinical trial was conducted to evaluate the role of azithromycin along with hydroxychloroquine in respiratory viral loads. Subjects with COVID-19 were included in the study and received study drugs and their viral loads were analyzed in nasopharyngeal swabs. Untreated patients from another center and cases who did not accept the protocol were included in the study as negative controls. The treated subjects showed a significant reduction in viral load compared to controls on 6th day after inclusion. Azithromycin added to hydroxychloroquine was significantly more effective in combatting the virus. The study showed that the combination treatment was significantly associated with viral load reduction/disappearance in patients with COVID-19.<sup>28</sup> This combination stands efficacious, but azithromycin is known to potentiate QT interval prolongation effect of hydroxychloroquine.

### CONCLUSION

COVID-19 virus outbreak has handicapped the medical, financial and public health infrastructure across the globe. Current actions are focused on social distancing, hand sanitization, disinfection of surroundings and quarantine of infected subjects. An effective and safe vaccine against this pandemic might be the ultimate answer, but until such a remedy is available it is important to focus also on pharmacological therapies of interest such as described in this piece of literature. In depth research on the pathogenesis of COVID-19 might help in discovery of appropriate targets for development of specific agents against this global enemy. Healthcare researchers are working hard and significant progress in identifying therapeutic alternatives to drugs has been made, controlled studies are required to find out in detail the efficacy as well as safety profile of drugs that stand as potential candidates for the treatment of subjects with COVID-19 infection. Meanwhile, it is important to follow therapeutic regimens recommended by health authorities at individual, national and global levels.

### REFERENCES

1. Shanmugaraj B, Siri wattananon K, Wangkanont K, Phoolcharoen W. Perspectives on monoclonal antibody therapy as potential therapeutic intervention for Coronavirus disease-19 (COVID-19). *Asian Pac J Allergy Immunol.* 2020; 38(1): 10-8.
2. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. *Lancet Lond Engl.* 2020;395(10223): 470-3.
3. Singhal T. A review of Coronavirus Disease-2019 (COVID-19). *Indian J Pediatr.* 2020; 87(4): 281-6.
4. Wujtewicz M, Dylczyk-Sommer A, Aszkielowicz A, Zdanowski S, Piwowarczyk S, Owczuk R. COVID-19-what should anaesthesiologists and intensivists know about it?. *Anaesthesiol Intensive Ther.* 2020; 52(1): 34-41.
5. Deng L, Li C, Zeng Q, Liu X, Li X, Zhang H, et al. Arbidol combined with LPV/r versus LPV/r alone against Corona Virus Disease 2019: a retrospective cohort study. *J Infect.* 2020.
6. Wang Z, Yang B, Li Q, Wen L, Zhang R. Clinical features of 69 cases with Coronavirus Disease 2019 in Wuhan, China. *Clin Infect Dis.* 2020.
7. Wang Z, Chen X, Lu Y, Chen F, Zhang W. Clinical characteristics and therapeutic procedure for four cases with 2019 novel coronavirus pneumonia receiving combined Chinese and Western medicine treatment. *Biosci Trends.* 2020; 14(1): 64-8.

8. Guo Y-R, Cao Q-D, Hong Z-S, Tan Y-Y, Chen S-D, Jin H-J, et al. The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak: an update on the status. *A thousand Med Res.* 2020; 7(1): 11.
9. Wang M, Cao R, Zhang L, Yang X, Liu J, Xu M, et al. Remdesivir and chloroquine effectively inhibit the recently emerged novel coronavirus (2019-nCoV) *in vitro*. *Cell Res.* 2020; 30(3): 269-71.
10. Wu YC, Chen CS, Chan YJ. The outbreak of COVID-19: an overview. *J Chin Med Assoc.* 2020; 83(3): 217-20.
11. Holshue ML, De Bolt C, Lindquist S, Lofy KH, Wiesman J, Bruce H, et al. First case of 2019 Novel Coronavirus in the United States. *N Engl J Med.* 2020; 382(10): 929-36.
12. Li G, De Clercq E. Therapeutic options for the 2019 novel coronavirus (2019-nCoV). *Nat Rev Drug Discov.* 2020; 19(3):149-50.
13. Yao T-T, Qian J-D, Zhu W-Y, Wang Y, Wang G-Q. A systematic review of lopinavir therapy for SARS coronavirus and MERS coronavirus: a possible reference for coronavirus disease-19 treatment option. *J Med Virol.* 2020.
14. Lim J, Jeon S, Shin HY, Kim MJ, Seong YM, Lee WJ, et al. Case of the index patient who caused tertiary transmission of COVID-19 infection in Korea: the application of Lopinavir/Ritonavir for the treatment of COVID-19 infected Pneumonia monitored by quantitative RT-PCR. *J Korean Med Sci.* 2020;35(6): e79.
15. Bhatnagar T, Murhekar MV, Soneja M, Gupta N, Giri S, Wig N, et al. Lopinavir/ritonavir combination therapy amongst symptomatic coronavirus disease 2019 patients in India: protocol for restricted public health emergency use. *Indian J Med Res.* 2020.
16. Dong L, Hu S, Gao J. Discovering drugs to treat coronavirus disease 2019 (COVID-19). *Drug Discov Ther.* 2020; 14(1): 58-60.
17. Delang L, Abdelnabi R, Neyts J. Favipiravir as a potential countermeasure against neglected and emerging RNA viruses. *Antiviral Res.* 2018; 153: 85-94.
18. Furuta Y, Komeno T, Nakamura T. Favipiravir (T-705), a broad spectrum inhibitor of viral RNA polymerase. *Proc Jpn Acad Ser B Phys Biol Sci.* 2017; 93(7): 449-63.
19. Baron SA, Devaux C, Colson P, Raoult D, Rolain J-M. Teicoplanin: an alternative drug for the treatment of coronavirus COVID-19?. *Int J Antimicrob Agents.* 2020; 105944.
20. Zhou N, Pan T, Zhang J, Li Q, Zhang X, Bai C, et al. Glycopeptide antibiotics potently inhibit Cathepsin L in the late endosome/ lysosome and block the entry of Ebola Virus, Middle East Respiratory Syndrome Coronavirus (MERS-CoV), and Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV). *J Biol Chem.* 2016; 291(17): 9218-32.
21. Zhang J, Ma X, Yu F, Liu J, Zou F, Pan T, et al. Teicoplanin potently blocks the cell entry of 2019-nCoV. *BioRxiv.* 2020.
22. Devaux CA, Rolain J-M, Colson P, Raoult D. New insights on the antiviral effects of chloroquine against coronavirus: what to expect for COVID-19? *Int J Antimicrob Agents.* 2020; 105938.
23. Wang P, Cheng Y. Increasing host cellular Receptor-Angiotensin-Converting Enzyme 2 (ACE2) expression by Coronavirus may facilitate 2019-nCoV Infection. *BioRxiv.* 2020.
24. Cortegiani A, Ingoglia G, Ippolito M, Giarratano A, Einav S. A systematic review on the efficacy and safety of chloroquine for the treatment of COVID-19. *J Crit Care.* 2020.
25. Wellems TE, Plowe CV. Chloroquine-resistant malaria. *J Infect Dis.* 2001; 184(6): 770-6.
26. Sahraei Z, Shabani M, Shokouhi S, Saffaei A. Aminoquinolines against Coronavirus Disease 2019 (COVID-19): chloroquine or hydroxychloroquine. *Int J Antimicrob Agents.* 2020; 105945.
27. Zhou D, Dai S-M, Tong Q. COVID-19: a recommendation to examine the effect of hydroxychloroquine in preventing infection and progression. *J Antimicrob Chemother.* 2020.
28. Gautret P, Lagier J-C, Parola P, Hoang VT, Meddeb L, Mailhe M, et al. Hydroxychloroquine and azithromycin as a treatment of COVID-19: results of an open-label non-randomized clinical trial. *Int J Antimicrob Agents.* 2020; 105949.

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**AUTHOR AFFILIATIONS:** (\*Corresponding Author)

1. BDS, PG student, School of Community Studies, Bow Valley College, 345, 6<sup>th</sup> Avenue SE, Calgary, AB T2G 4V1, Canada

**Contact corresponding author at:** Chanprits[at]gmail[dot]com

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## Oral Ornaments: An Overview

RAJNEESH PARIMOO<sup>1</sup> , BALJEET SINGH<sup>2</sup>, DIVYA SHARMA<sup>3</sup>, VANSHIKA SHARMA<sup>3</sup>, AQUIB JAVAID<sup>4</sup>

Nowadays, people desire to look attractive and have become very alert about their appearance and smile. Since the face is most exposed part of our body, and mouth a prominent feature, teeth are getting enormous share of attention. Intraoral jewellery has currently gained popularity and is slowly becoming a craze, but this fashion trend is also associated with some significant health issues. These ornaments though are said to enhance beauty cause problems such as increase pain, infection, scar formation, tooth fractures, metal hyper-sensitivity reactions, localized periodontal disease, speech impediment, and nerve damage. This review draws special attention to the prevalence, complications, and side effects of dental jewellery in humans. Here we suggest people must be aware of all the risks associated with wearing dental jewellery, and they should undergo dental check-ups regularly.

**KEYWORDS:** Esthetics, Oral health, Dentistry, Hygiene

### INTRODUCTION

There is an old saying that when you smile, the entire world smiles with you. Having a beautiful smile is as important as being confident. Tooth jewellery is the latest thing in dentistry which may be used to make someone's smile more alluring. Tooth jewellery is placed on to the tooth surface via dental procedure; this process is known with name of tooth piercing. Nowadays, tooth jewels are gaining attention because substantial number of people are concerned about the way they look. Tooth jewels are adding some spark to their appearance.<sup>1</sup> Different type of shapes; colours of stone are available to suit the zest of the person. The varied oral jewellery practiced today are grill jewellery, dazzlers and twinkles, veneer jewellery, tooth rings, tongue studs, lip studs, lip rings, cheek studs, etc. Tooth jewellery was in use earlier as an element of the religious rituals and traditions, but today it's more targeting cosmetic function.<sup>2</sup>

Literature describes various short-term and long-term effects related to oral piercings on oral and general health. Gingival recession was the foremost persistent complication which is followed by tooth fracture and periodontal problems. Case report studies have also showed embedding of the piercing and prolonged bleeding after piercing. Endocarditis, infection/abscess, and ingested piercing can be harmful for general health.<sup>3</sup> Sometimes improperly placed dental jewels leads to unbearable post-procedure irritation and even could result into loss of tooth. Thus, it could

be said that oral piercings do involve some risk.<sup>3</sup>

It's important to find out the prevalence of oral and/or peri-oral piercings to estimate the impact of this phenomenon on every day clinical practice; especially for the dental health care professional.<sup>4</sup> The aim of this review is to see the various types, prevalence, complications, and side effects of oral ornaments.

### HISTORICAL BACKGROUND

Body piercing has been practiced in ancient times too. Piercings are found on preserved bodies of individuals who lived between 4000 and 5000 years ago.<sup>5</sup> The Mayans pierced their tongue to demonstrate virility and courage as well.<sup>6</sup> Recent analysis of thousands of teeth examined from collections in Mexico's national institute of anthropology and history, showed that ancient people of southern North America visited the dentists to beautify their choppers with notches, grooves, and semiprecious gems.<sup>7</sup> Body piercing is trending among people of different regions, social groups, ages. A survey conducted in western cultures over oral body modifications reported that oral piercing was limited to lip. (i.e. lip stud or labret); lip piercings are often placed anywhere near the vermilion border.<sup>6</sup> However, even now during this present era, people use dental jewellery while visiting parties, ceremonies or any event. Many of the people have chosen dentistry as mean to reinforce their living style more fashionable.<sup>7</sup>



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## TYPES OF ORAL ORNAMENTS

**Grill Jewellery:** The interest the grills draw to the mouth is reflective of the importance of vocal dexterity within the African American community. They are made up of gold, silver or platinum, and are sometimes decorated with precious stones and cover the maxillary and mandibular anterior teeth. Earlier, they were fitted permanently after tooth preparation but nowadays grills are generally removable (figure 1).<sup>8</sup> Grills have become so usual that one can purchase a grill anywhere, from the local mall to the online shopping. Some Internet-based companies even send purchasers a home kit that consists of a 2-part putty and impression trays.<sup>9</sup>



**Figure 1.** Handmade and Customized to Fit Grill Jewellery

**Dazzlers and Twinkles:** Most frequently they comprise an additional thin multi carat gold coating, crammed with special glass or precious stones. This incorporates ordinary stones to diamonds and other gems. The stones are attached directly or embedded in a precious metal and then attached to teeth. The metals on which the stones are attached are available in various shapes and sizes. The normal stones are available in various colors.<sup>10</sup> The enamel is etched and then the stones are luted with flowable composites and no tooth preparation is involved. The foremost liked stone is the white coloured one and the tooth often preferred is the maxillary anterior teeth. However, maxillary lateral incisor is often selected among other teeth and the stones are placed towards the incisal edge.<sup>2</sup>

**Tooth Gems:** A tiny rhinestone jewel attached to the tooth surface with the help of an adhesive. Some are small stones within the centre of the tooth, other times individuals pick to put a jewel-encrusted cap over their teeth. Tooth gems are available in several colors

(figure. 2). No quite teeth preparation is required for these accessories, just etching and bonding is sufficient.<sup>11</sup> There also are removable gems available. These are when the stones are arranged on an invisible glass like microskin. This is, in turn, fabricated within the laboratory to which the precious stones are attached. They can be removed by the individual and fitted when necessary.<sup>12</sup>



**Figure 2.** Tooth Gems Available in Different Colours

**Tooth Rings:** This requires tooth preparation. A tiny hole is made towards the disto-incisal corner of the maxillary incisors and therefore the ring is hung down through it. The maxillary central incisors are the foremost commonly preferred teeth. The dimensions of the perforation depend on the thickness of the ring selected. The perforation should be prepared as smoothly as possible and polished. Sometimes these rings are embedded with precious stones.<sup>2</sup> The overjet available should even be taken into consideration when selecting the diameter of the ring to avoid interference in occlusion. The rings are sometimes made connecting the two central incisors or the central incisor to the lateral incisor.<sup>10</sup>

**Tooth Tattoos:** Tooth tattoos are the latest form of art, where hand painted craft is placed onto one's tooth. Typically tooth tattoos are applied to a replacement crown before it's inserted into one's mouth, although the method is also possible with an intentionally removed tooth. This term is additionally used for temporary decals and stains used to decorate the teeth. Dental tattoos can potentially be applied to any tooth, and that they run a large gamut of designs, colours and styles.<sup>13</sup>

**Oral Tissue Piercing:** Oral piercing sites for jewellery placement include the lips, cheeks, frenum, and uvula. However, the foremost common site for oral piercing is the tongue. Piercings that are most often applied within the oral and perioral areas are captive – bead ring, labret and barbell.<sup>14</sup>

The predilected area of the piercing within the mouth are the lips and tongue, followed by the cheeks, uvula and lingual frenulum.<sup>15</sup> Personnel performing piercing are usually unlicensed and unprofessional with little knowledge on the local anatomy, sterilization procedures, subsequent complications and their management. In such a case the situation is also challenging.<sup>16</sup>

### COMPLICATIONS ASSOCIATED WITH ORAL ORNAMENTS

Well known complications linked to tooth jewellery are discussed below so as to aware the people, because now-a-days most of the people are recommended to use tooth jewellery so as to reinforce their aesthetics and to enhance the self-worth and self-esteem additionally, but there are certain complications related to it. Because of that tooth jewellery is extremely recommended only in those patients who specifically take care of their oral hygiene. Complications of dental jewellery are elaborated by different researchers, can be categorised as acute (or early) and late (or chronic).<sup>17</sup>

**Acute complications:** Acute complications related to oral jewellery includes post-operative pain, bleeding because of damage to the blood vessels, tearing of the surrounding tissues, metal allergy, alteration in taste due to nerve damage, speech and mastication problems and generation of galvanic current between the accessories and dental restorations.<sup>12,18,19</sup>

**Chronic complications:** Dental trauma is more often seen with longer jewellery and is related to longer duration of damage. Replacing jewellery with shorter ones may reduce the intensity of injury.<sup>16,17</sup> Chronic complications include trauma to the gingiva or mucosa (figure 3), fractured or chipped teeth, increased accumulation of plaque and calculus causing infection, gingival recession, allergy, scarring, localized tissue overgrowth, obstruction while taking X-rays for complete examination and aspiration of the jewel or a component of it causing airway obstruction.<sup>16</sup> Oral jewellery may obstruct during intubation procedure. Ultrasound, CT and MRI images could also be hindered by metal jewellery. Piercing is additionally related to the danger of transmission of blood borne diseases like HIV, Hepatitis B, C, D and G, Herpes simplex, Epstein Barr virus, tetanus, syphilis or tuberculosis.<sup>20,21</sup> Bacterial infections with

*Staphylococcus aureus* and *Pseudomonas aeruginosa*,  $\beta$ -hemolytic streptococcus have also been reported.<sup>22</sup>



**Figure 3.** Gingival Recession Caused by Back of Lip Piercing Jewellery

### DISCUSSION

Aesthetics has become a very important feature of dentistry over the recent years and has led to the buildout of recent materials and techniques. Everybody wishes to form their own visual style which makes them unique and yet identifiable among the group.<sup>23</sup> Body art once viewed as a stigmatized behaviour is now embraced by the youth as a part of fashion and self-expression. Recent days have seen the entry of such practices even into the mainstream community that has professionals, athletes, college students and actors. Several reasons are cited behind this practice. The necessity for feeling unique and self-identity are the prime reasons (figure 4).<sup>24</sup> Teenagers and young adults want to precise their individuality in a very simple desire, some people consider it sort of a test of courage and endurance of pain or a variety of provocation and challenge to society, other see it sort of a fashion.<sup>14</sup> People belonging to any or all age groups are being interested in this type of body art but most typically, it's worn by 18-35 year old hip-hop artists and disc jockeys so as to add on to the extravagance of their performance and to urge an additional spark to their smile while interacting with the audience.<sup>2</sup> Jewellery used for piercing are usually made of metals like stainless-steel, 14 or 18 karat gold, niobium, titanium, platinum, palladium or metal alloy. Recently synthetic materials like teflon, nylon or plastic are used. Studs, rings and bar bells are commonly used. Dimensions of the jewellery relies on the tissues to be pierced and personal choice.<sup>16</sup> It's possible for people with jewellery within the oral and perioral regions to experience problems like pain, infection at the



**Figure 4.** Man Gets in Guinness Book of World Records for the Maximum Number of Body Piercings

location of the piercing, transmission of systemic infections, endocarditis, oedema, airway problems, aspiration of the jewellery, allergy, bleeding, nerve damage, cracking of teeth and restorations, trauma of the gingiva or mucosa, and Ludwig's angina, as well as changes in speech, mastication and swallowing, or stimulation of salivary flow.<sup>25</sup> Staying updated with current trends that affect the mouth will contribute toward comprehensive care for those served.

## CONCLUSION

Dental jewellery has evolved an extended way from the prehistoric times and is here to remain. It's important for dental professionals to be geared to the changing times and keep themselves updated to be able to cater to and satiate the aesthetic needs of the individuals. It must even be understood that within the world of dental jewellery, the road between aesthetics and potential risks are often very thin. Given the risks related to invasive ornaments like piercings, it's highly recommended that individuals should possess sound knowledge of frequent complications of defects caused by piercing an ornament within the mouth and are advised for correct oral hygiene maintenance and regular dental check-up.

## REFERENCES

1. Vazhiyodan A, Mohan S, VizhiGk, Khan R. Sparkling smile. *J I Dent.* 2013;1(1):1-3.
2. Peter T, Titus S, Francis G, Alani M, George AJ. Ornamental Dentistry- an overview. *Journal of evolution of medical and dental sciences* 2013;2(7):666-76.
3. Hennequin-Hoenderdos NL, Slot DE, Van der Weijden GA. Complications of oral and peri-oral piercings: a summary of case reports. *Int J Dent Hyg.* 2011;9:101-9.
4. Hennequin-Hoenderdos NL, Slot DE, Van der Weijden GA. The prevalence of oral and peri-oral piercings in young adults: a systematic review. *Int J Dent Hyg.* 2012;10(3):223-8.
5. Chivers L. Body adornment: piercings and tattoos. *Nurs Stand.* 2002;16:41-5.
6. Peticolas T, Tilliss TS, Cross-Poline GN. Oral and perioral piercing: a unique form of self-expression. *J Contemp Dent Pract.* 2000;1(3):30-46.
7. Bhatia S, Gupta N, Gupta P, Arora V, Mehta N. Tooth jewellery: Fashion and dentistry go hand in hand. *Indian J Dent Adv.* 2015;7:263-8.
8. Lo'pez-Jornet P, Camacho-Alonso F, Pons-Fuster JM. A complication of lingual piercing: a case report. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2005;99:18-9.
9. Hollowell WH. A new threat to adolescent oral health: the grill. *Pediatric Dentistry* 29;4:320-2.
10. Neiburger E. A large hypertrophic-keloid lesion associated with tongue piercing: case report. *Gen Dent.* 2006;54:46-7.
11. Schorzaman CM, Gold MA, Downs JS. Body art; attitudes and practices regarding body piercing among urban undergraduates. *J Am Osteopath Assoc.* 2007;107:432-8.
12. Monisha N. Dental jewellery - A review. *Journal of Pharmacy Research* 2018:73-5.
13. Kharat N, Singhai A, Prasant MC, Patil KAK, Ali FM. A tooth tattoo with a purpose: An innovative approach. *Journal of Evolution of Medical and Dental Sciences* 2014 ;3(4):921-5.
14. Maspero C, Farronato G, Giannini L, Kairyte L, Pisani L, Galbiati G, The complication of oral piercing and the role of dentist in their prevention: A literature review. *Stomatologija* 2014;16:118-24.
15. Soileau KM. Treatment of a mucogingival defect associated with intraoral piercing. *J Am Dent Assoc.* 2005;136(4):490-4.
16. Nandini DB. Oral piercing and its implications on the health of oral tissues: Aesthetics or mutilation?. *International Journal of Oral Health Dentistry* 2018;4(1):12-6.
17. De Moor RJ, De Witte AM, Delmé KI, De Bruyne MA, Hommeez GM, Goyvaerts D. Dental and oral complications of lip and tongue piercings. *Br Dent J.* 2005;199:506-9.
18. Shacham R, Zaguri A, Librus HZ, Bar T, Eliav E, Nahlieli O. Tongue piercing and its adverse effects. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2003;95:274-6.
19. Ehrlich A, Kucenic M, Belsito DV. Role of body piercing in the induction of metal allergies. *Am J Contact Dermat.* 2001;12:151-5.



20. Levin L, Zadik Y, Becker T. Oral and dental complications of intra-oral piercing. *Dent Traumatol.* 2005;21(6):341-3.
21. American Dental Association. ADA Statement on Intraoral/Perioral Piercing. Accessed May 14, 1999
22. Escudero-Castaño N, Perea-García MA, Campo-Trapero J, Cano-Sánchez, Bascones-Martínez A. Oral and perioral piercing complications. *Open Dent J.* 2008;4:133-6.
23. Bhatia S, Arora V, Gupta N, Gupta P, Bansal M, Thakar S. Tooth jewellery-its knowledge and practice among dentists in Tricity, India. *J Clin Diagn Res.* 2016;10:ZC32
24. Joys NP, Karuppaiah RM, Garla BK, Taranath M, Pandian RP. "Say Cheese" is Passe', "Say Bling" is Here- The Evolution of Dental Jewelry: A Review. *Journal of Advanced Oral Research.* 2016;7(3):1-6.
25. Dermata A, Arhakis A. Complications of oral piercing. *Balk J Stom.* 2013;17:117-21.

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**AUTHOR AFFILIATIONS:** (\*Corresponding Author)

1. Senior Lecturer, Department of Periodontology, Desh Bhagat Dental College and Hospital, Fatehgarh, Punjab.  
[ORCID ID: <https://orcid.org/0000-0002-4200-3854>]
2. Prof & Head, Department of Periodontology, Bhojia Dental College and Hospital, Baddi, Distt. Solan, Himachal Pradesh
3. Postgraduate Student, Department of Periodontology, Bhojia Dental College and Hospital, Baddi, Distt. Solan, Himachal Pradesh
4. Senior Lecturer, Department of Prosthodontics, Bhojia Dental College and Hospital, Baddi, Distt. Solan, Himachal Pradesh

**Contact corresponding author at:** [parimoor\[at\]gmail\[dot\]com](mailto:parimoor[at]gmail[dot]com)

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# A Swollen Seed Found in a Child's Ear Amidst COVID-19 Lockdown: A Case Report

POOJA PANWAR\*<sup>1</sup>, RAJEEV G. DOLE<sup>2</sup>, DEVANSHU CHAUDHARY<sup>3</sup>, MANJIRI KESKAR<sup>4</sup>, SHIVKANT SHARMA<sup>5</sup>A  
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Foreign body lodgement in external auditory canal in pediatric age group is a common problem encountered by Otolaryngologists in emergency as well as in outpatient department. A case report of swollen seed found in external auditory canal in right ear, of a 6-year-old boy out of poverty, neglect and unavailable ENT consultant OPD due to lockdown for the serious pandemic condition.

**KEYWORDS:** External Auditory Canal, Seed, Foreign Body, Coronavirus

## INTRODUCTION

One of the most common problem an Otolaryngologist or an ENT surgeon face in the pediatric population is the presence of Foreign Body (FB) in the ear. The foreign body varies its profile and can be classified as animate and inanimate foreign body. The inanimate foreign bodies are further classified into two groups as vegetative and non-vegetative foreign bodies, and hygroscopic and non-hygroscopic foreign body. The foreign body includes seeds, nuts, grains and others. The most common ear foreign bodies include paper, cotton wool, rubber, stones, beads, plastic toys, stones, and popcorn kernel.<sup>1</sup> In the series of animate foreign bodies the commonly found are cockroaches and beetles and also include insects like ants, moths, flies, etc.<sup>2</sup>

These foreign bodies seek instant attention as it can lead to severe pain, anxiety, and discomfort to the patient.<sup>3</sup> The episodes of foreign bodies are more frequently seen in children than adults, which can be characterized by certain clinical features such as otitis externa attributable to a foreign body in the external meatus which leads to deafness, tinnitus, and otalgia. The seriousness of this common problem can be understood with the detailed knowledge of complication associated with it. Beside the problem of bleeding and otitis externa the major complications in the procedure of foreign body removal are iatrogenic complication like canal laceration, bleeding, infection, and perforation of tympanic membrane.

Hence, an attempt is made with the help of this case report to highlight the incidence of a swollen seed in the external auditory canal and the complications in its line of treatment.

## CASE REPORT

A 6-year-old male child presented to the emergency of Saksham Hospital, Saharanpur (U.P) with his grandmother and Pradhan of village with a complaint of pain and fullness in right ear. On examination the condition was diagnosed as Otagia, which is turning to be severe and has been progressive for about 1 week. There was pain or ache and feeling of fullness of the affected ear. His parents stated that they tried some home remedies such as oil pulling in affected ear at home and also some chandelier tried for affected ear due to unavailability of medical facility in lockdown. The Otagia and discomfort of child is so much severe that it gains the attention of village Pradhan, who brought him to the random Clinic in Saharanpur where he was referred to the ENT OPD of Saksham Hospital. The family was facing poverty and illiteracy due to which they found it difficult to seek proper treatment to the child. His father is a farmer and mother house wife.

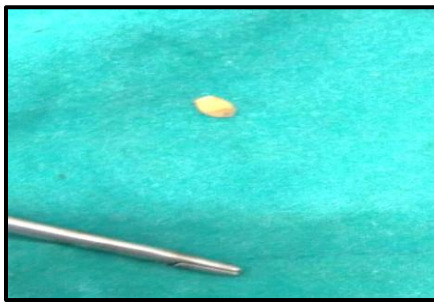
**On examination:** The child was afebrile, not pale and anicteric. His temperature was 37° C, pulse rate 97 beats/min and weight 28 kg. On examining the ears with otoscope, the left ear was essentially normal. In the right ear there was preauricular and



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post auricular tenderness. The external auditory canal was edematous and congestion present. The tympanic membrane (TM) was normal. Rinne test was positive in the right ear and negative in left ear. Weber test lateralized to the right ear. Pure tone audiometry was not done due to the condition of the affected ear.

The foreign body was near to posterior inferior quadrant adherent to sulcus terminalis and firstly an attempt was made with hert'sman forcep and Jobson's probe to remove but its failed then it's removed by syringing with Luke warm water with savlon and it's turned out to be a swollen seed (Figure 1). Repeat otoscopy revealed the TM was intact, dull and mild congestion present. The EAC also appeared oedematous and mild lacerated especially around the area of seed impacted. The EAC was further cleaned and mobbing done. Tuning fork test repeated without any change in the result. Patient was given oral antibiotics and analgesics, and appointment given for follow up. He however did not show up again.



**Figure 1.** Swollen Seed removed from the Child's ear.

## DISCUSSION

The cause of foreign bodies in nose or ear has been recognized to the broad-spectrum inquisitiveness and a urge to explore orifices in children, playful insertion of foreign bodies into others' body parts, accidental entry of foreign body, pre-existing disease in ear causing irritation, habitual cleaning of ear and nose with objects like ear buds.<sup>4</sup> It was once thought that the tendency of a few children to inflict foreign body upon self or others is a kind of childish attitude. A significant morbidity can occur due to the presence of foreign body in the ear and may be due to the small anatomic size and gentle skin of the EAM and the thinness of the tympanic membrane.<sup>15</sup> In case of vegetable foreign

bodies if left untreated, break down to release irritant vegetable oil and leads to inflammation. The condition can even turn out to be worst if the foreign body gets swollen and later it can be sprouted. Some of the common reason behind this is neglect, and deceptive show by the parents due to poverty and ignorance. In this case poverty, lack of knowledge, and unavailability of proper medical care due to lock down can leads to such complications. But with the efforts of child's parents and Pradhan we pull out the seed before germination and further complications. The cases of unusual foreign body in ear have been reported but the case of swollen seed or germinated seed are rare.<sup>6,7</sup> Hence, an attempt has been made to describe the case of swollen seed and its complications in a tough time of severe pandemic situation

## CONCLUSION

We conclude that the case of swollen seed in the ear is an unusual clinical situation. Poverty, illiteracy, and a severe pandemic condition make it difficult to seek better health care delivery in our environment. Focus should be on strengthening the health care delivery system for the needy population even in the severe pandemic conditions and low economic budget families.

## REFERENCE

1. Ansley JF, Cunningham MJ. Treatment of aural foreign bodies in children. *Pediatrics* 1998; 101(4): 638-41. <http://dx.doi.org/10.1542/peds.101.4.638>
2. Sarkar S, Roychoudhury A, Roychoudhuri BK. Foreign bodies in ENT in a teaching hospital in Eastern India. *Indian J Otolaryngol Head Neck Surg.* 2010; 62(2): 118-20. <http://dx.doi.org/10.1007/s12070-010-0040-6>
3. Bressler K, Shelton C. Ear foreign body removal: a review of 98 consecutive cases. *Laryngoscope* 1993; 103: 367-70. <http://dx.doi.org/10.1002/lary.5541030401>
4. Das SK. Aetiological evaluation of foreign bodies in the ear and nose. *J Laryngol Otol.* 1984; 98: 989-91. <http://dx.doi.org/10.1017/S002221510014784X>
5. Ijaduola GT, Okewo PA. Foreign body in the ear and its importance; the Nigerian experience. *J Trop Pediatr.* 1986; 32:4-6. <http://dx.doi.org/10.1093/tropej/32.1.4>
6. DiMuzio J Jr, Deschler DG. Emergency department management of foreign bodies of the

external ear canal in children. *Otol Neurotol.* 2002; 23:473-5. <http://dx.doi.org/10.1097/00129492-200207000-00014>

7. Cimolai N, Cimolai TL. Otitis from the common bedbug. *The Journal of Clinical and Aesthetic Dermatology* 2012;5(12):43-5 .

8. Bala A, Purushotman R, Lina LC, Avatar S. Superglue Accidentally Used As Ear drops. *Med J Malaysia.* 2012;67(2); 212-13.

9. Arora S, Goyal SK. Unusual foreign body in the ear in an adult with psychiatric illness. *Indian Journal of Psychiatry.* 2009;51(2):164. <http://dx.doi.org/10.4103/0019-5545.49467>

10. Schulze SL, Kerschner J, Beste D. Pediatric external auditory canal foreign bodies: a review of

698 cases. *Otolaryngol Head Neck Surg.* 2002;127(1):73-8.

<http://dx.doi.org/10.1067/mhn.2002.126724>.

11. Phillips JJ, Patil P. Swallowed foreign bodies. *J Laryngol Otol.* 1988;102:235-41.

12. Balbani AP, Sanchez TG., Butugan O., et al. Ear and nose foreign body removal in children. *Int J Pediatr Otorhinolaryngol.* 1998;46(1-2):37-42. doi: 10.1016/S0165-5876(98)00118-9.

13. Davies PH, Bengner JR. Foreign bodies in the nose and ear: a review of techniques for removal in the emergency department. *J Accid Emerg Med.* 2000;17(2):91-4.

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**AUTHOR AFFILIATIONS: (\*: Corresponding Author)**

1. BAMS, PG Scholar, Department of Shalakya Tantra, Parul Institute of Ayurveda, Parul University, Vadodara, Gujrat
2. BAMS, MS, Professor and Head of Department of Shalakya Tantra, Parul Institute of Ayurveda, Parul University, Vadodara, Gujrat
3. BDS, MDS, Department of Public Health Dentistry, Clinician at K.S Memorial Oro dental Clinic, Sharanpur, Uttar Pradesh
4. BAMS, MS, Ph.d, Senior Professor, Department of Shalakya Tantra, Parul Institute of Ayurved, Parul University, Vadodara, Gujrat
5. BAMS, MS, Assistant Professor, Department of Shalakya Tantra, Parul Institute of Ayurved, Parul University, Vadodara, Gujrat

**Contact Corresponding Author at:** drpoojapanwar1[at]gmail[dot]com

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# An Absurd Concept of Self-Medication: A Case of Oral Chemical Burn

YAGYESHWAR MALHOTRA<sup>1</sup>, PARUL UPPAL MALHOTRA<sup>\*2</sup>, NEERA OHRI<sup>3</sup>, ANINDITA MALLIK<sup>4</sup>

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A chemical burn is seen in oral cavity after a noxious agent is placed in direct contact with the mucosa as a mode of self treatment or iatrogenically by dentist. Mild lesions due to less irritating agents result in mild alteration in texture, while more severe lesions (soreness to outright pain) are due to more irritating agents and because of agents of longer duration of contact. Commonly used chemicals used by patients for tooth pain are aspirin which is placed next to the offending tooth and OTC preparations. The essential oil based preparations are easily available in pharmacies or are prepared by local people. These medicaments can harm a patient if not used under medical or ayurvedic supervision as they have beneficial plant extracts, essential oils etc. A case of such self inflicted chemical burn of the oral mucosa is reported due to use of clove oil preparation available locally, used with varying amount and frequency. History of using over the counter medicaments for dental ailment should be asked when patients visit the dentist with complains of burning or white patch in mouth.

**KEYWORDS:** Clove oil, Chemical Burn, Trauma

## INTRODUCTION

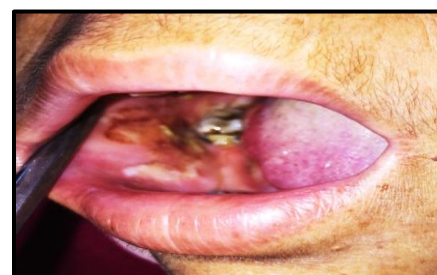
Oral chemical burn or ulcers due to the over-the-counter (OTC) medicaments are rare. These lesions resemble different oral lesions. The clinical presentation of these lesion depends on the composition, pH, concentration, quantity, duration, mode of application to tissue, the extent of penetration into tissue, and the mechanism of action. These chemicals can cause diffuse erosive lesions like simple desquamation (mucosal sloughing) or complete mucosal detachment with extension into the submucosa.<sup>1</sup>

Trauma to oral tissues from chemicals poses a diagnostic challenge and hence a detailed history will help to differentiate possible causes of the presenting lesion(s). The clinician should focus on obtaining relevant information from patient should be able to establish a temporal relationship between the usage of OTC preparation and onset of oral lesions. Patient is advised to discontinue medicament application immediately to ensure complete healing.<sup>2</sup> The clove oil which contains unrefined eugenol has been used for relieving toothache from many decades. Chisholm in 1873 had described its therapeutic usage and formed a plastic mass by mixing it with zinc oxide. Its antibacterial, sedative and anodyne properties are well established.<sup>3,4</sup> This case report focuses on a case of such self-inflicted chemical burn of the

oral mucosa reported due to use of clove oil preparation available locally.

## CASE REPORT

A 55 year old female patient reported in Department of Dentistry with a chief complaint of oral ulceration since a day. There was history of repeated toothache for which he applied clove oil on a cotton swab in the mucobuccal fold alongside the tooth. She experienced burning and severe pain due to oil application. On oral examination 48 was carious mesially and was periodontally involved along with clinically missing 46, and 47. The lesion seen on right buccal mucosa adjacent to 46 to 48 was white and brownish in appearance and had greatest dimensions of 3.5 x 2.5 cm (figure 1).



**Figure 1.** Irregular ulceration on buccal mucosa



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As there were missing 46, 47, the chemical had involved the tongue as well (figure 2). The lesion on tongue involved right lateral surface had whitish appearance and was 3.5 x 1.5 cm in greatest dimensions. Both the lesions were shallow and had irregular borders. On palpation, the Lesions were tender. Patient was advised for discontinuation of oil application. The lesions healed slowly over a period of 3 weeks along with application of Triamcinolone acetonide 0.1% w/w ointment twice daily and Benzydamine hydrochloride 0.15% w/v mouthwash which relieved burning.



**Figure 2.** Ulceration on Tongue

## DISCUSSION

The chemical burns of oral cavity present as whitish lesions covered by pseudomembrane, are irregular in shape and are usually very painful. These burns can cover a large area of oral cavity. If the tissue are contacted for shorter duration cannot lead to necrosis but a shallow lesion with whitish and wrinkled appearance are seen.<sup>5</sup>

In India, the land of Ayurveda and natural medicine, use of medicaments obtained or prepared from plant origin is a great practice especially in rural regions. These extracts from medicinal herbs and plants proven to be therapeutically useful for various ailments have been manufactured by a few local brands as oils or ointments & easily available over the counter. Many herbal remedies have been used for oral health for hundreds years.<sup>6</sup> An Ayurvedic specialist's consultation is always required to avoid irrational use of herbal preparations as it can lead to systemic and local effects. The chemical trauma seen in oral cavity is one of the local effect.<sup>7</sup>

These over the counter drugs can have Caustic chemicals which are often very irritating and cause direct trauma to oral mucus membrane. Most commonly used medications such as keeping aspirin directly in vestibular mucosa of carious painful tooth, may result in chemical burn. Iatrogenically, irrigant solutions (sodium hypochlorite or formalin) can irritate the mucosa during endodontic treatment.<sup>8</sup> However, such injuries are rare since the introduction of rubber dam in dental practice.

Eugenol is the a main ingredient of many dental materials. The oral soft tissue reactions to eugenol can be of three different ways: (1) having adverse effect on fibroblasts and osteoblast-like cells and is cytotoxic at high concentrations hence produces necrosis and reduced healing,<sup>9</sup> (2) act as a contact allergen leading to localised delayed hypersensitivity reaction in lower concentrations,<sup>10</sup> and (3) when placed in the mouth, sometimes cause significant generalized allergic reaction.<sup>11</sup>

Prevention is the best treatment of chemical burns of the oral cavity. The iatrogenic chemical burns can be prevented by use of rubber dam. The turnover of oral mucosa is considered very high which results in faster rate of healing in case of superficial burns usually 7 to 14 days.<sup>5</sup> The antibiotics are needed in very rare cases. The hyaluronic acid gel is considered to help in the healing process. The treatment after chemical injuries, depending upon the severity of lesion, can range from symptomatic topical application of lignocaine, benzydamine, intralesional corticosteroids, caustic acid ingestion, commissuroplasty to mucosal or free radial forearm or free jejunal graft. The surgeries can be done with electrocautery or soft tissue lasers, and wounds are covered by periodontal pack.<sup>12</sup>

## CONCLUSIONS AND PRACTICAL IMPLICATIONS

This case highlights the importance of detailed clinical history to make a final diagnosis and magnitude of educating a patient to prevent future mucosal injury from inappropriate self-treatment. Dentists should include oral chemical burn in diagnosis when a patient has an irregular shallow ulcer or a large necrotic mucosal lesion located near decayed tooth. This understanding can help

in early recognition of this condition and decreases the probability of overtreatment.

## REFERENCES

1. Dayakar MM, Pai PG, Madhavan SS. Tetracycline hydrochloride chemical burn' as self-inflicted mucogingival injury: a rare case report. *Journal of Indian Society of Periodontology* 2012;16(2):282-5.
2. Middleton CE, Berwick JE, Adamson DN. Chemical burn in the oral cavity. *U.S. Army Medical Department Journal* 1995;8:10-2.
3. Hume WR. The pharmacologic and toxicological properties of zinc oxide-eugenol. *J Am Dent Assoc.* 1986;113(5):789-91. <https://doi.org/10.14219/jada.archive.1986.0256>.
4. Newman MG, Hulem C, Colgate J, Anselmo C. Antibacterial susceptibility of plaque bacteria. *J Dent Res.* 1979;58(7):1722-32. <https://doi.org/10.1177/00220345790580071401>.
5. Greenberg MS, Glick M. *Oral Medicine Diagnosis & Treatment* Burket's Tenth Edition. BC Decker Inc.; 2003
6. Little JW. Complementary and alternative medicine: Impact on dentistry. *Oral Surg Oral Pathol Oral Radiol Endod.* 2004;98:137-45. <https://doi.org/10.1016/j.tripleo.2004.05.011>.
7. Shishir RS, Renita C, Kumuda AR, Subhas BG. Irrational use of Eucalyptus oil in dentistry: a case report. *Bangladesh Journal of Medical Science* 2011; 10(2): 122-4.
8. Ariyawardana A. Traumatic oral mucosal lesions: A mini review and clinical update. *Oral Health and Dental Management* 2014;13(2):254-9.
9. Rivera C, Droguett D, Arenas Márquez MJ. Oral mucosal lesions in a Chilean elderly population: A retrospective study with a systematic review from thirteen countries. *Journal of Clinical and Experimental Dentistry* 2017;9(2):e276-83.
10. Iegami CM, Tamaki R, Neto PT. A 5-week non-surgical approach towards denture induced hyperplasia. *The Open Dentistry Journal* 2017;11:151-4.
11. Vieira-Andrade RG, Zuquim Guimarães Fde F, Vieira Cda S, Freire ST, Ramos-Jorge ML, Fernandes AM. Oral mucosa alterations in a socioeconomically deprived region: Prevalence and associated factors. *Brazilian Oral Research* 2011;25(5):393-400.
12. Rallan M, Malhotra G, Rallan N, Mayall S. Management of chemical burn in oral cavity. *BMJ case reports* 2013. <https://doi.org/10.1136/bcr-2013-009083>.

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### AUTHOR AFFILIATIONS: (\*: Corresponding Author)

1. MDS (Orthodontics and Dentofacial Orthopedics), Consultant Orthodontist, Kangra, HP, India
2. MDS (Paediatric and Preventive Dentistry), Medical officer (Dental), Community Health Centre, Nalagarh, Solan, HP, India
3. MDS (Oral Medicine and Maxillofacial Radiology), Senior Resident, Department of Dentistry, Dr RPGMC, Tanda at Kangra, HP, India
4. MDS (Orthodontics and Dentofacial Orthopedics), Consultant Orthodontist, Siliguri, WB, India

Contact Corresponding Author at: [parulmalhotra09\[at\]gmail\[dot\]com](mailto:parulmalhotra09[at]gmail[dot]com)



# An Online KAP Study to Assess Contraceptive Use Among Reproductive Females in North-Western India

NAVEEN VERMA<sup>1</sup>, JOHN KARTHIK<sup>2</sup>, SAMEER JAIN<sup>3</sup>

**INTRODUCTION:** The use of contraceptives has been practiced since thousand of years and if used correctly can lead to birth control.

**AIM:** To assess the knowledge, attitude and practices of contraceptive of reproductive females aged 18 years and above.

**MATERIALS AND METHOD:** The present study was cross-sectional in nature and included married females above 18 years of age were asked to fill up an online questionnaire, divided into 4 sections and containing 17 questions. After application of descriptive statistics, the multivariate logistic regression and Pearson's correlation was applied. p value was significant when it was  $\leq 0.05$

**RESULTS:** Most respondents has poor knowledge (54.5%) of contraceptives with the most preferred method of contraception being OCP (36.3%) closely followed by condoms (36.1%). Awareness regarding emergency use on contraceptives was mostly seen to be poor (43.9%). The most common method used for contraception was condoms (49.7%), followed by IUDs (15.6%), Injectables (14.3%) and OCPs(12.7%). Only a few (5.3%) did not practice any method for contraception and 2.4% underwent sterilization. the multivariate logistic regression revealed a significant relation ( $p=0.03$ ) while and Pearson's correlation ( $p=0.76$ ) revealed a strong association.

**CONCLUSION:** There is a need to educate females more about the various methods of contraception to promote their reproductive health

**KEYWORDS:** Contraceptives, Reproductive Health, Unplanned Pregnancy

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## INTRODUCTION

As per current estimates, global population is expected to reach 9.2 billion from the current 6.7 billion by the year in 2050.<sup>1</sup> Such an increase in population shall burden the existing infrastructure as well as nutrition, healthcare and overall well-being of a population. To combat the effects of such a mammoth rise in population, governments have included family planning as a part of their population control initiative.

Fertility control since beginning has been used in different forms with coitus interruptus (withdrawal) being the oldest known method to man.<sup>2,3</sup> Research estimates that even in today's modern times, approximately 222 million couples do not use any type of contraceptives; and this primarily is due to the lack of the required knowledge and means as well as taboos and beliefs associated with use of various methods of contraception.<sup>4</sup>

Across the globe, the concept of "family planning" is promoted by various governments and organizations as a mechanism to address the reproductive health needs of men and women and to combat the rise in

population.<sup>5</sup> This concept uses the practice of spacing between each child (in years) through the use of contraceptive methods; and this idea is supported by the fact that among women with unintended pregnancies, approximately 60% of them were not using any form of contraception.<sup>6,7</sup> It was also found out that among these women, about 12.4% of them relied on ineffective traditional methods for contraception.<sup>8</sup>

Due to a lack of effective contraceptive options for men (mostly in the form of condoms, withdrawal methods and vasectomy), it is women who nearly have to bear the responsibility for fertility regulation.<sup>9</sup> It has been documented that the proportion of couples using one or more contraceptive technique in developing countries fluctuate between 20% and 60%.<sup>10</sup>

Unplanned pregnancies often result in induced abortion, which poses a major challenge to the reproductive health of young adults in developing countries like India.<sup>11</sup> It is important that females of reproductive age have adequate knowledge of various methods used of contraception to prevent any



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unplanned pregnancies, which can affect their health significantly and hence, the present study aimed to assess the knowledge, attitude and practices of contraceptive of married females aged 18 years and above.

## MATERIALS AND METHOD

The present study adopted a cross sectional design and conducted over a period of three months (April 2020 to June 2019) through distribution of an online questionnaire using google forms (Link displayed at various PHCs, Government and Private Hospitals as well as social media) and focussed on women in North Western India. The link was shared with the maximum sample possible and also distributed on social media sites.

The study was approved by the Institutional Ethical Board and upon clicking the link and/or the QR code, the first page assured the females of the confidentiality of their data. The females were free to leave the questionnaire in between and incomplete responses were excluded from the study.

**Designing of the questionnaire:** The questionnaire was pre-tested and pre-validated prior to its distribution. It contained four sections comprising of a total of 17 Questions (Knowledge: 7, Attitude: 6, Practice: 4) was also available in Hindi to overcome any language barrier. The translation in hindi was done by a language expert and back translated by another, blinded translator. Every correct answer was awarded 1 mark, while incorrect answers were given 0 marks. Respondents receiving  $\geq 14$  marks were considered having good knowledge,  $\geq 8$  were considered to have fair knowledge while a score below 8 was classified as having poor knowledge.

**Study population:** Married females between 18-45 years served as inclusion criteria, while unmarried females were excluded.

**Statistical Analysis:** After application of descriptive statistics, the multivariate logistic regression and Pearson's correlation was applied. p value was significant when it was  $\leq 0.05$ .

## RESULTS

It was observed that among the 551 complete responses received, most respondents has poor knowledge (54.5%), followed by fair (25.2%) and poor(20.3%) knowledge. The most known contraceptive method was

Oral Contraceptive Pills (OCP) (36.3%) closely followed by condoms (36.1%). Awareness regarding emergency use on contraceptives was mostly seen to be poor (43.9%). Social media (29.8%) was the main source of information on contraceptive use while 9.5% were provided information by their parents/family (Table 1).

ITEM	n,%
<b>Knowledge on Contraception</b>	
Good	112 (20.3%)
Fair	139 (25.2%)
Poor	300 (54.5%)
<b>Methods Used for Contraception</b>	
Condoms	199 (36.1%)
IUCD	105 (19.1%)
OCP	200 (36.3%)
Sterilization	08 (1.5%)
Injectables	39 (7%)
<b>Awareness regarding emergency and use of contraception</b>	
Good	87 (15.8%)
Fair	222 (40.3%)
Poor	242 (43.9%)
<b>Source of Information on contraceptive</b>	
Health Care Worker	123 (22.3%)
Social Media	164 (29.8%)
Print Media	101 (18.3%)
Colleague	111 (20.1%)
Parents/family	52 (9.5%)

**Table 1.** Knowledge, Methods, Awareness and Source of Information among Females

It was observed that the most common method used for contraception was condoms (49.7%), followed by IUDs (15.6%), Injectables (14.3%) and OCPs (12.7%). Only a few (5.3%) did not practice any method for contraception and 2.4% underwent sterilization (Table 2).

Method Used for contraception	n,%
None	29 (5.3%)
Condoms	274 (49.7%)
OCPs	70 (12.7%)
IUDs	86 (15.6%)
Sterilization	13 (2.4%)
Injectables	79 (14.3%)

**Table 2.** Methods Used for Contraception among Females

Upon comparison of the awareness regarding contraceptives, the multivariate logistic regression revealed a significant relation ( $p=0.03$ ) while and Pearson's correlation ( $p=0.76$ ) revealed a strong association. However, comparison of knowledge and use of contraceptives did not bear any significant results (Table 3).

	Multivariate Logistic Regression	Pearson's Correlation (r)
Awareness on contraceptives	0.03*	0.76
Knowledge and use of contraceptive	1.32	0.34

**Table 3.** Comparison of Awareness Regarding Contraceptives

## DISCUSSION

The findings of the present study revealed that most females (54.5%) of reproductive age in India had poor knowledge on the various methods of contraception used for family planning. In contrast, good knowledge scores regarding contraceptives were reported by 63.0% females in Nigeria<sup>12</sup> as well as 87% females in Shillong, Meghalaya, India.<sup>13</sup> Such poor knowledge can be due to the fact that even with various technological advancements in India, the use of "Sex Education" in schools is limited and talking about contraceptives in itself is considered as a social taboo due to various religious beliefs.

Knowledge gained regarding contraceptives among females in the present study was mainly from social media (29.8%) followed by healthcare worker (22.3%) or a colleague (22.3%). Similar results were reported by Sweya MN et al. [friends (44.8%), television (40.3%), and health care workers (39.0%)].<sup>14</sup> Also in agreement, females in the study population of Pegu et al.<sup>13</sup> reported their knowledge from health workers (58.6%), followed by media (24.1%) and social circle (15.5%).

It was reported that 5.3% of the females did not use any method of contraception. These findings are in disagreement to Thapa P et al. (70.8% of the women reported of having ever used any type of contraceptives) as well as various other studies indicating a high promotion but low utilization of contraceptives, making this situation a serious challenge in developing countries. The most common type of contraceptive in

the present study was found to be condoms (49.7%), which is in agreement to various authors.<sup>9,12,14</sup>

The present study is prone to certain limitations. The first being the inadvertent social desirability bias and the second being the under-over-reporting of the data by the respondents. To eliminate the bias, no personal data (except for location) was collected and confidentiality of data was assured.

## CONCLUSION

Based on the results of the present study, there is a need to educate females more about the various methods of contraception to promote their reproductive health as well as to avoid any unplanned pregnancies and complications arising from induced abortions.

## REFERENCES

- Hammad AQ, Hashmi A, Syed AR, Jamil AS, Aslam G. Contraceptive methods and factors associated with modern contraceptive in use. *J Family Reprod Health.* 2010;4(1):41-46.
- Ezeh AC, Bongaarts J, Mberu B. Global population trends and policy options. *Lancet.* 2012;380:142-148.
- Aldabbagh RO, Al-Qazaz HK. Knowledge and Practice of Contraception Use Among Females of Child-Bearing Age in Mosul, Iraq. *International Journal of Women's Health* 2020;12:107-113
- Cleland J, Bernstein S, Ezeh A, Faundes A, Glasier A, Innis J. Family planning: the unfinished agenda. *Lancet.* 2006;368(9549):1810-1827. doi:10.1016/S0140-6736(06)69480-4
- Pandey S, Karki S, Pradhan A (2010) Practice of contraceptives. *Journal of Institute of Medicine* 31: 3-9.
- Thapa P, Pokharel N, Shrestha M (2018) Knowledge, Attitude and Practices of Contraception among the Married Women of Reproductive Age Group in Selected Wards of Dharan Sub-Metropolitan City. *J Contracept Stud Vol.3 No.3:18*
- Duze MC, Mohammed IZ. Male knowledge, attitudes, and family planning practices in Northern Nigeria. *Afr J Reprod Health* 2006;10:53-65.
- Oye-Adeniran BA, Adewole IF, Umoh AV, Oladokun A, Ghadegsin A, Ekanem EE, et al. Community-based study of contraceptive behaviour in Nigeria. *Afr J Reprod Health* 2006;10:90-104
- Al-Sekait MA. Prevalence of contraception used among Saudi Arabian women. *Saudi Med J.* 1999;20(9):687-690.
- Bearak J, Popinchalk A, Alkema L, Sedgh G. Global, regional, and subregional trends in unintended pregnancy and its outcomes from 1990 to 2014:

estimates from a Bayesian hierarchical model. *Lancet Glob Health*. 2018;6(4):e380–e389. doi:10.1016/S2214-109X(18)30029-9

11. Anupama Srivastav, Mohammad Shams Khan, Chitra Rani Chauhan. "Knowledge, Attitude and Practices about Contraceptive among Married Reproductive Females". *International Journal of Scientific Study*. 2014;1(5):2-4.

12. Osaro BO, Tobin-West CI, Mezie-Okoye MM. Knowledge of modern contraceptives and their use among rural women of childbearing age in Rivers State Nigeria. *Ann Trop Med Public Health* 2017;10:1043-8

13. Pegu B, Gaur BPS, Sharma N, Singh AS. Knowledge, attitude and practices of contraception among married women. *Int J Reprod Contracept Obstet Gynecol*. 2014;3:385-8. 10.5455/2320-1770.ijrcog20140620

14. Sweya MN, Msuya SE, Mahande MJ, Manongi R. Contraceptive knowledge, sexual behavior, and factors associated with contraceptive use among female undergraduate university students in Kilimanjaro region in Tanzania. *Adolesc Health Med Ther*. 2016;7:109-115.

<https://doi.org/10.2147/AHMT.S108531>

15. Haque Md N. Unmet need for contraceptive: the case of married adolescent women in Bangladesh. *Int J Curr Res* 2010:29-35.

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**AUTHOR AFFILIATIONS:** (\*Corresponding Author)

1. MD (Preventive and Social Medicine), Private Practitioner and Consultant Doctor, Nahan, HP, India
2. MD (Preventive and Social Medicine), Private Practitioner and Consultant Doctor, Hyderabad, Telangana, India
3. MBBS, Consultant Surgeon, Bhopal, Madhya Pradesh, India

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# Seasonal Distribution of Diarrhea among Children aged 1-5 Years in Slums of Southern India: A Cross-Sectional Door to Door Survey

SREEKANT P.,\*<sup>1</sup> JAYAPRAKSH T.,<sup>1</sup> IYENGER P.<sup>1</sup>

**INTRODUCTION:** Diarrhea, a water borne disease is very prevalent in children under 5 years of age and lead to serious consequences among them if not treated on time.

**AIM:** To assess the Seasonal Distribution of diarrhea among children aged 1-5 years in slums of southern India

**MATERIALS AND METHOD:** The study was a planned door to door survey via a standard, pre-validated and pre-tested questionnaire among the slums the states of Maharashtra, Karnataka, Tamil Nadu and Kerala. Data was collected from the mothers/caretakers of children aged 1-5 years regarding Diarrheal episodes in the past one year. Data was analysed using SPSS version 22.0 and by applying the independent samples t-test as well as the multivariate logistic regression.

**RESULTS:** A total of 2684 children were reported having diarrhea, out of which there were slightly more females (52.1%) as compared to males (47.9%). 55.1% of children were treated at home, while 34.2% needed consultation and 10.7% required hospitalization. Most cases were reported in the monsoon season (39.3%), followed by summer (30.6%), winter(22.5%) and autumn (7.6%). The independent samples t-test ( $p=0.03$ ) as well as the multivariate logistic regression ( $p=0.01$ ) showed significant results while comparing the occurrence of diarrhea in monsoon seasons in comparison to other seasons.

**CONCLUSION:** Further studies are advised among slum dwellers so that proper and tailor made programs can be directed in reducing the effect of diarrhea in children residing in slums in southern India.

**KEYWORDS:** Diarrhea, Children, Mortality, Summer

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## INTRODUCTION

Among children in developing countries, diarrheal diseases have been attributed as a major cause of morbidity and mortality.<sup>1,2</sup> Across the globe, it has been reported that children under five years experience an average of 3.2 diarrheal episodes per year with an estimated death of 1.87 million children as a result of dehydration due to diarrhea.<sup>3,4</sup>

According to WHO, diarrhea is the passage of 3 or more times loose or liquid stools per day or more frequently than the normal for the individual is classified as diarrhea. Among children, diarrhea can also lead to malnutrition, stunted growth and reduced well-being; as a result of which, can affect intellectual development, leading to significantly lower than average scores in intelligence tests. The diarrhoeic episodes also need medical attention leading to increased costs of care, especially among the economically weak societies.

The prevalence of diarrhea varies as per seasons; It has been reported that in temperate climates, bacterial

diarrhea occur more frequently during the warm season, whereas viral diarrhea, particularly diarrhea caused by rotavirus peak during the winter. The incidence of rotavirus diarrhea is seen throughout the year in tropical climates with an increased incidence in drier, cool months. Authors report that persistent diarrhea follows the same seasonal patterns as that of acute watery Diarrhea.<sup>5-7</sup>

A study carried out 2013 revealed six factors independently associated with diarrheal diseases which were consisted of occupation of the parent/guardian, not washing hands after changing napkins by the caregiver/guardian, the child drinking untreated water, child not exclusively breastfed and the child not washing hands before going to the washroom and eating one's food.<sup>8</sup>

Due to the above mentioned factors regarding diarrhea and its ability to cause mortality/serious effects on children and its relation with seasonal variations, the present study was carried out to assess



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the seasonal distribution of diarrhea among children aged 1-5 years in Slums of southern India.

## MATERIALS AND METHODS

The present study was planned as a door-to-door survey among various slums in southern India, which comprised of the states of Maharashtra, Karnataka, Tamil Nadu and Kerala from 1<sup>st</sup> December 2018 to 1<sup>st</sup> July, 2019. Data collection was done via a standard, pre-validated and pre-tested questionnaire with Cronbach's alpha as 0.7.

Prior to the commencement of the study, all necessary approvals were obtained and a written, informed consent was taken from the participants. Participants included mothers, fathers or caretakers of children aged 1-5 years and they were asked about data occurrence of diarrhea among the children in the past one year.

The questionnaire was filled by volunteers recruited prior to the study and duly standardized to the study objectives as well as the data required to be filled in the questionnaire. An important criteria was that the volunteers, needed to speak the local language to avoid any comprehension/language bias by the participants. Based on the results of a pilot study, the minimum sample required was 354. However, inclusion of massive sample was sought by the researchers. Data was analysed using SPSS version 22.0 and by applying the independent samples t-test as well as the multivariate logistic regression.

## RESULTS

Table 1 describes the study population. A total of 2684 children were reported having diarrhea, out of which there were slightly more females (52.1%) as compared to males (47.9%).

GENDER	AGED 1-5 YEARS
Males	1399 (47.9%)
Females	1285 (52.1%)
Total	2684 (100%)

**Table 1.** Characteristics of the Study Population

The treatment modality adopted for diarrhea is shown in table 2. It was observed that 55.1% of children were treated at home, while 34.2% needed consultation from a doctor and only 10.7% of children required hospitalization.

TREATMENT MODALITY	1-5 Years
Home Treatment with fluids/home remedies/ORS	1478(55.1%)
Need to consult doctor	919(34.2%)
Required Hospitalization	287 (10.7%)
TOTAL	2684 (100%)

**Table 2.** Treatment Modality Adopted for Diarrhea

The seasonal occurrence of diarrhea is shown in table 3. Most cases were reported in the monsoon season (39.3%), followed by summer (30.6%), winter(22.5%) and autumn (7.6%). The independent samples t-test ( $p=0.03$ ) as well as the multivariate logistic regression ( $p=0.01$ ) showed significant results while comparing the occurrence of diarrhea in monsoon seasons in comparison to other seasons (table 3).

SEASON	1-5 Years	P value	Multivariate Analysis
Monsoon	1054 (39.3%)	0.03*	0.01*
Summer	822 (30.6%)		
Winter	604 (22.5%)		
Autumn	204 (7.6%)		
TOTAL	2684 (100%)		

**Table 3.** Frequency Of Diarrhea Occurrence As Per Seasons

## DISCUSSION

Across the globe, acute Diarrheal outbreaks have been commonly attributed to contaminated water worldwide.<sup>9</sup> The present study revealed that most cases of diarrhea most cases were treated at home with home remedies/fluids (55.1%) and is lower as compared to 90.6% (Sutariya et al.)<sup>10</sup> Bhattacharya R et al. reported that Camphor and Asfoetida were the commonly used home remedies followed by salt sugar solution of variable composition, soda water with sugar and lemon.<sup>11</sup>

It was observed that most cases of diarrhea in children occurred in the monsoon season (39.3%). These results are contraindicated by studies of Jayalakshmy R et al.

and Gupta N et al. who reported the maximum incidence of diarrheal diseases during the summer months followed by rainy or winter months.<sup>12,13</sup>

It has been reported that the risk of developing diarrheal diseases was 6.41 times higher among undernourished children compared with normal children.<sup>14</sup> Authors have also reported that socioeconomic status, poor maternal literacy, inadequate breastfeeding, malnutrition, poor sanitation and hygiene practices of the mother are associated with a higher incidence of diarrheal diseases in young children.<sup>15</sup>

Due to the exploratory nature of the present study, the results post a grim picture of diarrhea among children under age 5 in slums of southern India. The limitations of the present study includes social desirability bias and recall bias by the respondents. However, we results of the present study can be generalized for the population and further studies are advised among slum dwellers so that proper and tailor made programs can be directed in reducing the effect of diarrhea in children residing in slums in southern India.

## CONCLUSION

Based on the results of the present study, further, detailed studies are advised, as well as targeted educational programmes to educate the children and their mothers regarding their general health (hand washing) and proper food processing etc.

## REFERENCES

1. Bin Mohanna MA, Al-Sonboli N. Prevalence of Diarrhea and related risk factors among children aged under 5 years in Sana'a, Yemen. *Hamdan Med J*. 2018;11:29-33
2. Kahlownn M, Tahir M, Rasheed H, Bhatti K. National water quality monitoring programme. Tech Rep. Fourth Technical Report, Pakistan Council of Research in water Resources, 2006.
3. Kosek M, Bern C, Guerrant RL. The global burden of Diarrheal disease, as estimated from studies published between 1992 and 2000. *Bulletin of the World Health Organization* 2003;81(3):197-204.
4. Boschi-Pinto C, Velebit L, Shibuya K. Estimating child mortality due to Diarrhea in developing countries. *Bulletin of the World Health Organization* 2008; 86(9):710-7.
5. Bowen A, Agboatwalla M, Luby S, Tobery T, Ayers T, Hoekstra RM, et al. Association between intensive handwashing promotion and child development in Karachi, Pakistan: A cluster randomized controlled trial. *Arch Pediatr Adolesc Med*. 2012;166:1037-44.
6. Grantham-McGregor SM, Walker SP, Chang S. Nutritional deficiencies and later behavioural development. *Proc Nutr Soc*. 2000;59:47-54.
7. Ahmed SF, Farheen A, Muzaffar A, Mattoo GM. Prevalence of Diarrheal Disease, its Seasonal and Age Variation in under- fives in Kashmir, India. *Int J Health Sci (Qassim)*. 2008;2(2): 126-133.
8. Karambu S, Matiru V, Kiptoo M, Oundo J, Characterization and factors associated with Diarrheal diseases caused by enteric bacterial pathogens among children aged five years and below attending Igembe District Hospital, Kenya. *The Pan African Medical Journal* 2014; 16(1):37.
9. WHO. Global Water Supply and Sanitation Assessment 2000 Report. Geneva: World Health Organization, 2000.
10. Sutariya S, Talsania N, Shah C. Study Of Prevalence Of Diarrheal Diseases Amongst Under Five Population. *National Journal Of Community Medicine* 2011; 2(1):96-99.
11. Bhattacharya R, Kaur P. Epidemiology Correlates Of Diarrhea In A Rural Area Of Varanasi. *Indian Journal of Community Medicine* 1989; 14(2):79-82.
12. Jayalakshmy R, Roy G, Premarajan KC. Incidence and risk factors of acute diarrheal disease among under-five children in urban slums in Pondicherry z— One year follow-up study. *Indian J Matern Child Health*. 2011;13:1-11
13. Gupta N, Jain SK, Ratnesh, Chawla U, Hossain S, Venkatesh S. An evaluation of diarrheal diseases and acute respiratory infections control programmes in a Delhi slum. *Indian J Pediatr*. 2007;74:471-6.
14. Melese B, Paulos W, Astawesegn FH, et al. Prevalence of diarrheal diseases and associated factors among under-five children in Dale District, Sidama zone, Southern Ethiopia: a cross-sectional study. *BMC Public Health* 19, 1235 (2019). <https://doi.org/10.1186/s12889-019-7579-2>.
15. Singh J, Gowriswari D, Chavan B, Patiat R, Debnath A, Jain D, et al. Diarrheal diseases amongst children under five. A study in rural Alwar. *J Commun Dis*. 1992;24(3):150-5.

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**AUTHOR AFFILIATIONS:** (\*Corresponding Author)

1. MD (Internal Medicine), Consultant Private Practitioners, Hyderabad, India.

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**Contact Corresponding Author at:** noicare[at]outlook[dot]com



# A Study Assessing Gender Distribution Using Maxillary Sinus

SWATI PARHAR<sup>1</sup>, AMANI MAHAJAN<sup>\*2</sup>, ANKUR GOEL<sup>3</sup>, ANDLEEB MANHAS<sup>4</sup>

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**INTRODUCTION:** Corpse recognition is a difficult procedure. Comparison of both ante mortem and post-mortem records is essential and assists in identification of corpses. Typical methods of identification however sometimes may be inconclusive. Gender determination is an important aspect in identification of corpses. Previously skull, pelvis and the long bones have been used in gender determination. It has been reported earlier that maxillary sinus remains intact even when skull and long bones may be badly disfigured in incarnated victims.

**AIM:** The aim of this study was to examine whether the measurements of the maxillary sinuses may possibly be used for gender determination.

**MATERIAL AND METHODS:** Computed tomography scans of total of 50 Adults patients within the age range of 25 to 65 years from the previous dental records were taken. Sample comprised of 25 (50%) males and 25 (50%) females. The width, height and length was measured in all cases using CT images.

**RESULTS:** Maxillary sinus exhibits anatomic variability between genders. A significant difference in the length and height of maxillary sinus was observed with respect to males and females. ( $p < 0.005$ )

**CONCLUSION:** We conclude from the present study that the height and length of maxillary sinuses together with other bones can be used for gender determination when skeleton is not available.

**KEYWORDS:** Maxillary sinus, Computerized tomography, Forensic medicine, Gender determination

## INTRODUCTION

Anthropometric characteristics are of primary significance to solve troubles associated with identification in forensic odontology. Craniometrical features can be used in identifying a person from remains of skull which may be found detached from its skeleton. Skeletal remains were used to identify gender of the person as the bones of the body are the last to die after death, next to the enamel of the teeth.<sup>1</sup>

In the field of forensic pathology, radiography finds its use in human identification, especially in cases where the body is either decomposed or burned (to any degree). The skull, pelvis, and femora are the most helpful remains for radiological gender determination. The maxillary sinuses have been documented in the literature to remain intact, although the skull and other bones may be severely disfigured in incinerated victims, and hence, they may also be used for identification of an individual.<sup>2</sup>

The determination of gender is a major step of identification in forensic medicine with Computed

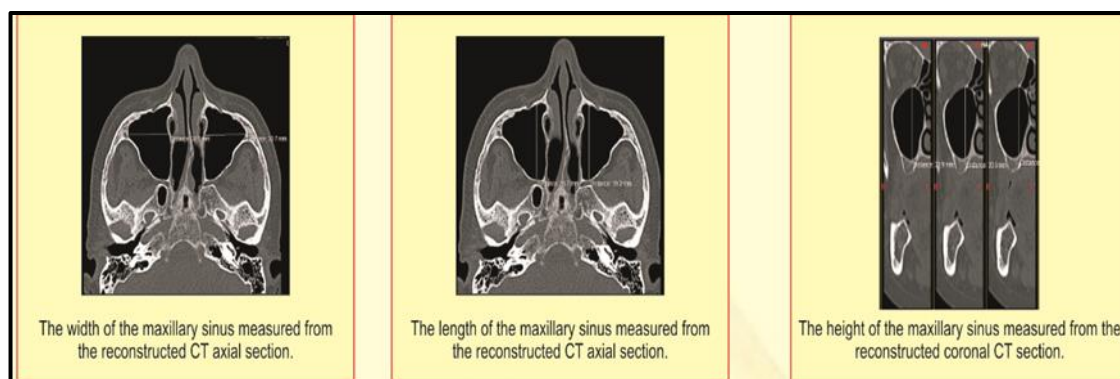
Tomography (CT) measurements of the maxillary sinuses being useful to support gender identification. In the absence of the whole skeleton, the width, length, and height of maxillary sinus together can be used for gender determination of an individual.

Maxillary sinuses have been documented to remain intact, although the skull and other bones may be badly disfigured in incinerated victims and, thus, maxillary sinuses may be used for identification. Maxillary sinuses are two air-filled spaces that are present in the maxillary bone and can be of different sizes and types with slender walls. In the zygomatic process, the apex of the sinuses may stretch and may occupy the zygomatic bone.<sup>3,4</sup>

At the close of the second embryonic month, the maxillary sinuses starts developing. When deciduous teeth fall off, maxillary sinus stretch to the roof of the permanent teeth. Around 20 years of age, when the permanent teeth fully grow in oral cavity, the maxillary sinuses attain their full sizes. Variations in their shapes







**Figure 1.** Height, width and length of maxillary sinus using a CT Scan.

and sizes occur during adulthood, particularly due to the tooth loss. Genetic disorders, post-infection and environmental factors are also known to affect the size of maxillary sinuses.<sup>5-7</sup>

Radiology can help to provide specific measurements which may help in gender determination. Best imaging technique to determine the sino-nasal cavities is computer tomography (CT) scans with a good accuracy rate. In computerised tomography (CT) scans, measurements of the maxillary sinuses may be used to assess age and sex when other approaches are inconclusive, although these measurements are not error-free.

Hence, in the present study we aimed to examine whether or not various dimensional parameters of maxillary sinuses like width, length and height can be used for the purpose of gender determination.

## MATERIALS AND METHODS

The present research was conducted in the department of oral and maxillofacial pathology. We included 100 cone beam CT scans of maxillary sinuses of patients who came for implants supported restorations and without any pathological findings. Patients selected were in the age range of 25-65 years. Among total 100 cases, 50 were male and 50 were females.

When CT was performed, the patients did not have sedation or contrast medium. All the sections were coronal in planes. Measurements of height, width and length were made in coronal planes where the maxillary sinus was in its widest place as a measuring

technique with the assistance of measurement equipment on the CT scan (figure 1).

**Statistical analysis:** Statistical analyses were completed using the SPSS version 20. Mean and standard deviations were recorded and percentages were also taken where required. Student t-test for was used to compare values between two comparable groups. p value <0.05 was considered as statistically significant.

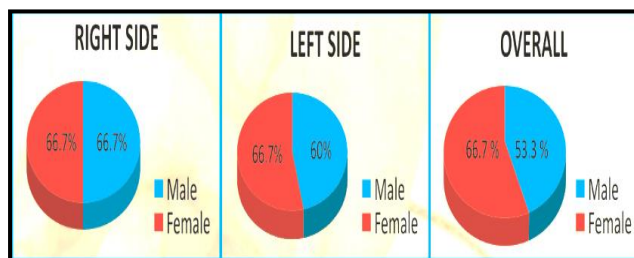
## RESULTS

In the present study we observed that maxillary sinus exhibited anatomic variability between both the genders. Mean value with standard deviations in relation to length, width and height are tabulated in the table 1. A significant difference in the length and height of maxillary sinus on both sides was observed with respect to males and females (p<0.05).

PARAMETER	MALE (n=25)	FEMALE (n=25)	p VALUE
Width right maxillary sinus	22.79±4.9	22.17±3.5	0.698
Height right maxillary sinus	34.82±5.7	30.76±4.4	0.038*
Length of maxillary sinus	34.35±3.2	30.72±4.7	0.046*
Width left maxillary sinus	23.49±5.3	22.21±4.2	0.472
Height left maxillary sinus	34.35±7.1	30.36±4.1	0.043*
Length of maxillary sinus	34.41±3.3	30.98±4.6	0.034*

**Table 1.** Mean values in relation to length, width and height as recorded in study population

In the present study, accuracy rates as observed showed that from right side 66.7% males and females were correctly identified, from left side 66.7% females and 60% males were identified correctly. Overall, the accuracy rate of the both right and left maxillary sinus together was 66.7% in females and 53.3% in males (figure 2).



**Figure 2.** Accuracy rates observed in the present study

## DISCUSSION

One of the major criteria of forensic identification is sex determination. The primary step to identification in medico-legal analysis is gender determination in both injured and mutilated dead bodies or from skeletal remains. Matching unique characteristics detected on dead bodies with data documented during an individual's life is a significant feature of forensics, and is accomplished using various techniques among which anthropological methods facilitate age and gender determination.

Results from the present study reveal that when height, length and width were compared between both the sexes, we observed that both height and length of right side were significantly greater among males in comparison to females. Even though the width of the sinus was greater in males in comparison to females, the difference was not significant.

Fernandes CL et al.<sup>8</sup> from their study revealed that the volume of the maxillary sinuses was greater in the Males rather than females, and with a precision of 79 percent. Maxillary sinuses of males, were found to be larger, but narrower in men than in women in Europe. Kim HJ et al.<sup>9</sup> reported that the maxillary sinuses are significantly larger in males as in comparison to females. Szilvassy J et al.<sup>10</sup> from their results showed that left maxillary sinus was greater in dimensions in comparison to right sinus in both males and females.

Teke HY et al.<sup>3</sup> aimed to enquire whether or not the

various dimensions of the maxillary sinuses can be used to determine gender in their study population. Their analysis revealed that the ability of the maxillary sinus size to identify gender-was around 69.4% in relation to females and it was around 69.2% in relation to males. Hence they concluded that dimensional evaluation of maxillary sinuses on CT can be helpful for gender determination in forensic medicine; however, with a relatively low-accuracy rate (less than 70%).

In yet another study by Farias GA et al.<sup>11</sup>, overall, different dimensions of maxillary sinuses were considerably greater in males. No statistically significant difference was observed between both the sides i.e the right and left side, within each study group. The most dimorphic measurement was the height, with a precision of 77.7% regarding gender estimation. They posted a gender estimate of 87.8% among women and 80% among males, with an accuracy level of 84%. They concluded that the formula developed using CBCT scans via calculations in the maxillary sinus showed an accuracy of 84 percent for sex estimation and can be applied in the Brazilian population as a complementary tool for human identification.

In 2013, 30 dry skulls of southern Indian origin were examined by Vidya CS et al.<sup>12</sup> The maxillary sinus height, weight, width and volume on each side were determined. The findings revealed that the measurements and the maxillary sinus volume of males were significantly greater relative to females. Statistically important values were shown by left width and right-sided volume.

## CONCLUSION

We conclude from the present study that both height and length of maxillary sinuses along with observations of other bones can be used during the process of gender determination in forensic studies especially when the complete skeletal remains are not available.

## REFERENCES

1. Nagare SP, Chaudhari RS, Birangane RS, Parkarwar PC. Sex determination in forensic identification, a review. *J Forensic Dent Sci.* 2018;10(2):61-6. [https://doi.org/10.4103/jfo.jfds\\_55\\_17](https://doi.org/10.4103/jfo.jfds_55_17)
2. Cameriere R, Ferrante L, Mirtella D, Rollo UF, Cingolani M. Frontal sinuses for identification: quality of classifications, possible error and potential corrections. *J Forensic Sci.* 2005;50(4):1-4.
3. Teke HY, Duran S, Canturk N, Canturk G. Determination of gender by measuring the size of the

- maxillary sinuses in computerized tomography scans. *Surg Radiol Anat.* 2007;29:9-13
4. Plenk JR, Tschabitscher M. (1986) Entwicklung, makro und mikromorphologie der kieferhöhlen. In: Watzek G, Matejka M (eds) *Erkrankungen der Kieferhöhlen*. Springer-Verlag, Wien, New York, pp 1-12
  5. Jovanic S, Jelacic N, Kargovska-Klisarova A. Le développement post-natal et les rapports du sinus maxillaire. *Acta Anat.* 1984;118:122-8.
  6. Kaptanoglu K, Ozdemir B. (2001) Gender dimorphism from skull thickness: a preliminary study (in Turkish). In: Annual forensic medicine meeting proceeding, \_ Istanbul, pp 153-156
  7. Karakas S, Kavaklı A. Morphometric examination of the paranasal sinuses and mastoid air cells using computed tomography. *Ann Saudi Med.* 2005;25(1):41-5.
  8. Fernandes CL. Forensic ethnic identification of crania: The role of the maxillary sinus - A new approach. *Am J Forensic Med Pathol.* 2004;25:302-13.
  9. Kim HJ, Yoon HR, Kim KD, Kang MK, Kwak HH, Park HD, Han SH, Park CS. Personal computer based three dimensional reconstruction and simulation of maxillary sinus. *Surg Radiol Anat.* 2002;24:393-9.
  10. Szilvassy J. The importance of the roentgenologic methods for the prehistoric and recent history excavation areas. In: *Up-to-date problems of the human evolution*. U. B. Bremer-Mus Bremen 1989;9:79-128.
  11. Farias GA, de Gamba OT, Yamasaki MC, Groppo FC, Haiter Neto F, Possobon RF. Development and validation of a formula based on maxillary sinus measurements as a tool for sex estimation: a cone beam computed tomography study. *Int J Legal Med.* 2019;133(4):1241-9. <https://doi.org/10.1007/s00414-018-1869-6>.
  12. Vidya CS, Shamasundar NM, Manjunatha B, Raichurkar K. Evaluation of size and volume of maxillary sinus to determine gender by 3D computerized tomography scan method using dry skulls of South Indian origin. *Int J Curr Res Rev.* 2013;5:97-100.

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**AUTHOR AFFILIATIONS:** (\*Corresponding Author)

1. Reader, Department of Oral Pathology, Swami Devi Dyal Hospital and Dental College, Barwala, Panchkula, India
2. Senior Lecturer, Department of Oral Pathology, Swami Devi Dyal Hospital and Dental College, Barwala, Panchkula, India
3. MDS (Oral Pathology), Consultant Dental Surgeon, Panchkula
4. MDS (Oral Pathology), Consultant Dental Surgeon, Jammu

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**Contact Corresponding Author at:** mahajan.amani8 [at]gmail[dot]com