Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 1267 - 1281
Received 16 February 2021; Accepted 08 March 2021.

Healozone: A New Way to Treat Dental Caries - A Review

Ritya Mary Jibu
Saveetha Dental College and Hospitals
Saveetha Institute of Medical and Technical Sciences, Saveetha University
Chennai
Tamil Nadu,India.
Email Id: rityajc25@gmail.com
Phone number: 6362759602

Leslie Rani S
Department of pathology
Saveetha Dental College and Hospitals
Saveetha Institute of Medical and Technical Sciences, Saveetha University
Chennai
Tamil Nadu, India
Mail id: leslieranis.sdc@saveetha.com
Mobile no: 9360293308

R. V. Geetha
Department of microbiology
Saveetha Dental College and Hospitals
Saveetha Institute of Medical and Technical Sciences, Saveetha University
162, Poonamallee High Road
Chennai- 600077
Tamil Nadu,India
Email :geetha@saveetha.com
Phone number : 9710456203

Corresponding author

Leslie Rani S
Department of pathology
Saveetha Dental College and Hospitals
Saveetha Institute of Medical and Technical Sciences, Saveetha University
Chennai
Tamil Nadu, India
Mail id: leslieranis.sdc@saveetha.com
Mobile no: 936029330

ABSTRACT

In most industrialized countries, dental caries (tooth decay) is a major oral health problem. Healozone is an oxygen generating system that adds ozone to the part of the tooth that is damaged by decay. A thorough literature search was performed using the database like PubMed,

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 1267 - 1281
Received 16 February 2021; Accepted 08 March 2021.

Google scholar, BioRxiv, MESH, Google Cochrane database using the keywords ‘healozone’ and ’ dental caries’ with no date and year restrictions. The language is restricted to English. 16 articles with similar data have been found which were analyzed and have been included in this study. The recent articles discussed in this study help us in gaining further knowledge about ‘healozone’ and their application in dental caries. The usage of healozone has been discussed in this article and has been widely used by dental practitioners with a 100% success rate. Healozone treatment is more in contrast to the current traditional therapeutic modalities as it is a minimally invasive and conservative approach, a very inexpensive, painless therapy that increases patient acceptance and compliance with minimal adverse effects. The main aim of the study is to fathom the application of healozone in the treatment of dental caries which is a significant area of focus in a majority of the countries since it affects the population on a vast scale.

Keywords

Healozone(x4) ; Dental caries ; Plaque ; Ozone therapy ; bacteria, treatment ; pain ; tooth loss

INTRODUCTION

In most industrialized countries, dental caries (tooth decay) is a major oral health problem affecting 60–90 percent of schoolchildren and the vast majority of adults.(Fejerskov and Kidd, 2009) Tooth decay, also known as dental caries or cavities, is a deterioration of teeth caused by bacteria-formed acids(Diesendorf, 1986; Mitchell, 2003). The cavities can range from yellow to black in several different colors. Symptoms may involve discomfort and feeding difficulties(Lewis, 1985; Pashley, 1985). At this stage, the tooth decay can be stopped or reversed. Enamel is able to fix itself using saliva minerals, and toothpaste fluoride or other sources(Pellico, 1988). The enamel gets damaged and eroded over time, thereby creating a cavity. A cavity is a permanent damage that a dentist is needed to fix with a fill(Li *et al.*, 2014). While some study suggests that ozone therapy's beneficial effects are consistent and effective, other sources suggest there is insufficient evidence to determine its true efficacy or safety(Tian*et al.*, 2015). HealOzone converts ambient oxygen into ozone oxide, which is an incredibly effective disinfectant. Healozone is a perfect tool for identifying and getting rid of any early signs of tooth decay before it progresses further(Brazzelli *et al.*, 2006). Healozone is an oxygen generating system that adds ozone to the part of the tooth that is damaged by decay. The ozone is working to destroy the bacteria that cause the tooth to deteriorate(Dukić, Dukić and Milardović, 2009). Research has shown that 99 percent of oral bacteria can be destroyed by as little as ten seconds of ozone therapy. Healozone has been used as a potent disinfectant; to guard against bleeding, to cleanse bone and soft tissue wounds and to improve healing by boosting local oxygen supply to the wound area in the field of dentistry.(Lynch *et al.*, 2004; Libonati *et al.*, 2019)

Tooth decay is the destruction of your tooth enamel, the hard, outer layer of your tooth. It can be a problem for children, teens, and adults. Plaque, a sticky film of bacteria, constantly forms on your teeth. When you eat or drink foods containing sugars, the bacteria in plaque produce acids that attack tooth enamel(Marsh, 1994). The stickiness of the plaque keeps these acids in contact with your teeth and over time the enamel can break down. The acid produced by the bacteria breaks down food debris or sugar on the surface of the tooth(Bibby, Volker and Van Kersteren, 1942; Chandrabhan *et al.*, 2012). Simple sugars in food are the primary source of energy for these bacteria and so a diet high in simple sugar is a risk factor(Kmietowicz, 2014).

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 1267 - 1281
Received 16 February 2021; Accepted 08 March 2021.

If mineral degradation is greater than building up from sources such as saliva, the result will be dental caries(Kidd, 2005; Silva da Cruz *et al.*, 2020). This is when cavities can form. Cavities are more common among children, but changes that occur with aging make cavities, an adult problem, too. Children with dental anomalies are at higher risk of caries(Harsha and Brundha, 2017). The recession of the gums away from the teeth, combined with an increased incidence of gum disease, can expose tooth roots to plaque(Febres, Echeverri and Keene, 1997; Cheng *et al.*, 2009). The cavities may vary from yellow to black in a variety of different colors. Symptoms can include discomfort and eating difficulties. Complications may include tissue inflammation around the tooth, tooth loss, and the development of infection or abscess(Cooper, 2015). Risk factors include disorders that contribute to lower saliva such as: diabetes mellitus, syndrome of Sjögren and certain drugs. Medicinal products that reduce the production of saliva include antihistamines and antidepressants.(MohammadSadeghi *et al.*, 2020) Dental caries are also associated with deprivation, inadequate mouth hygiene, and receding gums leading to exposure of the teeth 's roots(Pitts, 2016).

Dental caries prevention requires daily teeth washing, a low sugar diet, and small quantities of fluoride. Brushing the teeth twice a day and flossing between the teeth once a day is recommended(Kaur, 2019). Fluoride can be obtained from water, salt, or toothpaste, among other sources. Treatment of a mother's dental caries may decrease the risk in her children by reducing the amount of such bacteria that she can transmit to them(Ziskin, 1926; Лукашевич *et al.*, 2017). Screening can lead to earlier detection. Depending on the severity of the damage, various procedures can be used to return the tooth to proper function or extract the tooth. There is no known method to grow large amounts of the tooth back(Murata, 2003). Treatment availability is often poor in developing countries. Paracetamol (acetaminophen) or ibuprofen are given to treat pain(Mp, Brundha and Nallaswamy, 2019). Radiation treatment to cancer therapy can cause xerostomia leading to dental decay (Balaji, Brundha and Path, 2016)
Treatments with Fluoride, i.e if your cavity has just begun, a fluoride treatment can help repair the enamel of your tooth, and even in very early stages, it can cure cavities which have undergone fillings, crowns, root canals, and tooth extractions(Brundha, Pathmashri and Sundari, 2019). Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Ariga *et al.*, 2018; Basha, Ganapathy and Venugopalan, 2018; Hannah *et al.*, 2018; Hussainy *et al.*, 2018; Jeevanandan and Govindaraju, 2018; Kannan and Venugopalan, 2018; Kumar and Antony, 2018; Manohar and Sharma, 2018; Menon *et al.*, 2018; Nandakumar and Nasim, 2018; Nandhini, Babu and Mohanraj, 2018; Ravinthar and Jayalakshmi, 2018; Seppan *et al.*, 2018; Teja, Ramesh and Priya, 2018; Duraisamy *et al.*, 2019; Gheena and Ezhilarasan, 2019; Hema Shree *et al.*, 2019; Rajakeerthi and Ms, 2019; Rajendran *et al.*, 2019; Sekar *et al.*, 2019; Sharma *et al.*, 2019; Siddique *et al.*, 2019; Janani, Palanivelu and Sandhya, 2020; Johnson *et al.*, 2020; Jose, Ajitha and Subbaiyan, 2020).
Our institution is passionate about high quality evidence based research and has excelled in various fields ((Pc, Marimuthu and Devadoss, 2018; Ramesh *et al.*, 2018; Vijayashree Priyadharsini, Smiline Girija and Paramasivam, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019; Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Chandrasekar *et al.*, 2020; Mathew *et al.*, 2020; R *et al.*, 2020; Samuel, 2021)

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 1267 - 1281
Received 16 February 2021; Accepted 08 March 2021.

Oral Microbes

The mouth contains a large range of oral bacteria, but it is known that only a few different species of bacteria cause dental caries: Streptococcus mutans and Lactobacillus among them(Timothy, Samyuktha and Brundha, 2019). Streptococcus mutans are gram-positive bacteria which make up biofilms on the teeth's surface. After fermentation of dietary sugars these organisms can produce high levels of lactic acid and are resistant to the adverse effects of low pH, essential properties for cariogenic bacteria(Prashaanthi and Brundha, 2018). As root surface cement is more easily demineralized than enamel surfaces[Citation error], root caries can be caused by a wider variety of bacteria, including Lactobacillus acidophilus, Actinomyces spp., Nocardia spp. and Streptococcus mutans(Kumar, Ashok Kumar and Brundha, 2016). Bacteria accumulate in a sticky, creamy-colored mass called plaque around the teeth and gums which serves as a biofilm(Preethikaa and Brundha, 2018; Hannah *et al.*, 2019). For example, sites with a low salivary flow rate (molar fissures) gather plaque[Citation error] more frequently than others. Grooves on the occlusal surfaces of molar and premolar teeth provide plaque bacteria with microscopic retention sites, as do the interproximal sites(Shreya and Brundha, 2017). Plaque can also accumulate above or below the gingiva where, respectively, it is referred to as the supra or subgingival plaque. These strains are bacterial, most notably S.Mutans can be acquired from a caretaker's kiss or by premasticated feeding(Kalaiselvi and Brundha, 2016). These microorganisms also cause eye infection and abscess (P Jannathulferdioz, no date). Mycobacterium species like Mycobacterium leprae affects the nervous system and produce parasthesia(Brundha, 2015)

The mutans streptococci, most notably Streptococcus mutans and Streptococcus sobrinus, and lactobacilli are the most common bacteria associated with dental cavities. However, cariogenic bacteria (the ones that may cause the disease) are found in the dental plaque(Swetha and Brundha, 2017), but they are typically too small to cause complications[Citation error] unless a balance change occurs. This is caused by local changes in the environment, such as the regular intake of sugar or insufficient removal of biofilm (toothbrushing). If left untreated, the disease can lead to discomfort, tooth loss and infection(John and Brundha, 2016).

Typically, dental caries can be spotted on two specific[Citation error] areas of the teeth: occlusal caries, which form at the topmost of the tooth where food particles repeatedly come into direct contact[Citation error] with the teeth and interproximal caries, which are dental caries forming between the teeth[Citation error].

Availability of ozone

Ozone (O_3) is a highly reactive gas that consists of three oxygen atoms. It is both a natural and a man-made product that occurs in the upper molecule of ozone (the stratosphere) and lower atmosphere (the troposphere) of the Earth. Ozone affects life on Earth in either good or bad ways, depending upon where it is in the atmosphere(Alpan and Bakar, 2018).

Stratospheric ozone is produced naturally by the interaction with molecular oxygen (O_2) through ultraviolet solar (UV) radiation.The "ozone layer", about 6 to 30 miles above the surface of the planet, decreases the amount of harmful UV radiation entering the surface of the Earth.

Tropospheric or ground-level ozone- what we breathe- is formed primarily from photochemical reactions between two major classes of air pollutants, volatile organic compounds (VOC) and nitrogen oxides (NOx). Traditionally, these reactions were seen as relying on the presence of heat and sunshine, resulting in higher concentrations of atmospheric ozone in summer months. However, in the last decade, high concentrations of ozone were also observed in cold months

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 1267 - 1281
Received 16 February 2021; Accepted 08 March 2021.

under specific circumstances; where a few high elevated areas in Western America have(Brundha and Saivignesh, 2019) formed ozone with high levels of local VOC and NOx emissions when the snow is on the ground and temperatures are near or below freezing. Ozone leads to what we usually perceive as "smog" or haze, which often happens most often throughout the summer, but does occur in some Southern and Mountain regions throughout the year(Brundha and Visha, 2019).

Ozone therapy

Our institution is passionate about high quality evidence based research and has excelled in various fields ((Pc, Marimuthu and Devadoss, 2018; Ramesh *et al.*, 2018; Vijayashree Priyadharsini, Smiline Girija and Paramasivam, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019; Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Chandrasekar *et al.*, 2020; Mathew *et al.*, 2020; R *et al.*, 2020; Samuel, 2021)

Ozone therapy is a common method in alternative medicine, using ozone gas to combat disease. Ozone is anoxygenic in shape. Ozone therapy professionals use gas or liquid formulations of ozone in alternative medicine for treating medical problems and as a topical disinfectant(Jain *et al.*, 2013). Ozone therapy refers to the use of ozone gas in medical practice. Ozone gas is an anoxygenic type. The colorless gas consists of three atoms of oxygen. A layer of ozone gas, in the upper atmosphere, protects the earth from UV radiation from the sun.Nevertheless, ozone is "a dangerous pollutant to the soil" at ground level(Yalavarthi, Nallaswamy and Jain, 2018).
Ozone gas is dangerous when a person inhales it, causing inflammation of the lungs and throat, coughing and aggravating symptoms of asthma. High exposure can cause damage to the lungs, which can be fatal. Nevertheless, some researchers suggest that, in medical conditions, ozone may have therapeutic effects(Feng *et al.*, 2020). One 2011 study, for example, states that ozone therapy has the following uses: treating arthritis, fighting viral diseases such as HIV and SARS, disinfecting wounds, activating the immune system, treating ischemic heart disease, macular degeneration, cancer.
Currently, researchers are studying the impact of ozone therapy on the human body to find any possible therapeutic benefits. Until now, however, no work has been conducted on the true efficacy and health of ozone therapy. For that reason, its use is not currently recognized by official organizations. The new HealOzone X4 is a radically different approach for quick and effective disinfection in the oral cavity. They have been used as virucidal treatment, bactericidal treatment, fungicide. For certain dental applications, high dose ozone can be used. For certain dental applications, high dose ozone can be used(McKenna, Borzabadi-Farahani and Lynch, 2013).

Healozone

HealOzone converts ambient oxygen into ozone oxide, which is an incredibly effective disinfectant. This ozone gas is then channeled to the target surfaces of the teeth through a handpiece(Babando, 2017). The revolution in the treatment of caries dependent on ozone is going forward: in recent years, HealOzone paved the way for highly successful, pain-free caries treatment and safe root canal care. This groundbreaking definition of treatment has now been applied to new indications that they are precise, gentle and confident(Lynch, 2004).

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 1267 - 1281
Received 16 February 2021; Accepted 08 March 2021.

Healozone in treatment of dental caries and its various applications in dentistry: Mixed in water or plant extracts, ozone allows dentists and patients to use a mouth rinse or agent that prevents bacteria in the mouth, encourages healthy gum tissue and accelerates surgical healing.
HealOzone is an oxygen-producing system that adds ozone to the part of the tooth that is damaged by decay. The ozone is working to kill the bacteria that cause the tooth to deteriorate. Research has shown that 99 percent of oral bacteria can be destroyed by as little as ten seconds of ozone therapy. Thanks to its undisputed power of disinfection over other antiseptics, ozone is a very effective substitute and/or supplementary disinfectant to regular antiseptics.
Aqueous ozone can be used according to Krammer, a German dentist: As a potent disinfectant; to guard against bleeding, to cleanse bone and soft tissue wounds, to improve healing by boosting local oxygen supply to the wound area, the temperature in the wound region should be increased to improve the metabolic processes related to wound healing as ozonated water should(Baysan and Lynch, 2006).
In cases of gingivitis, oral thrush or stomatitis, ozonated water may be used as a mouth rinse, as a spray for cleaning the affected area, and as a water jet for treating painful gingivitis and stomatitis. Diagnostics tool in testing vitality of pulp, prosthodontics and restorative coronary dentistry disinfection, disinfection of cavities,(Vieira *et al.*, 2020) dental disorders-caries, fistula splits, root canal treatment, tooth whitening, hypersensitivity to the dentine, abscess, granuloma, fistulae, aphthae, herpes infection, stomatitis like candidiasis. In surgeries like implantation, replantation, extraction, cure of wounds, bleeding prolonged with coagulopathy, and in orthodontics for temporomandibular joint dysfunctions, trism, relaxation, myo arthropathy. While treating patients dentists are advised to wear personal protective equipments(Ravichandran and Brundha, 2016)

Other applications

Product photo (Prozone) by W and H
Prozone is easy to use and safe to administer as the tissue-compatible dosages can be configured according to the endodontitis and periodontitis indication areas. A hygienic technique is maintained during the gassing of the pockets as the plastic attachments (Perio tips or Endo tips) are exchangeable. The expense ranges from 5000 rs. to 10,000 rs(Murphy, Jin and Zehnder, 2020).

Ozotop
It is a lightweight tabletop device that is easy to use and has a free flow ozone delivery system that uses corona discharge. It is a lightweight table top device that is easy to use and has a free flow ozone delivery system that uses corona discharge. Ambient air that is filtered and dried before passing over a ceramic plate is used in this method, later high voltage is applied which finally produces ozone(Zanjani *et al.*, 2015).

Customized thermoformed dental appliance
A hard-or medium-soft thermoformed dental appliance which extends 2-3 mm beyond the affected gingival area and leaves a free space for gas circulation could be prepared for application of ozone gas. 2 ports should be connected at distal and mesial of the treatment area, respectively, for the gas inlet and exit.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 1267 - 1281
Received 16 February 2021; Accepted 08 March 2021.

Irrigation with ozonated water

Given that ozone water is highly effective in killing both Gram-positive and negative microorganisms, areas affected during and after scaling may be irrigated with ozone water by root planing and non-surgical pocket curettage. The bactericidal activity of ozone water against bacteria is high in plaque biofilm.

Ozone Nanobubble water

Since the half-life of ozonated water is only about 20 min because of which it degrades back into oxygen, its potency must therefore be guaranteed by using it within the first 5-10 minutes after development(‘“Ozone Nano Bubble Water: A Magic Wand for the Treatment of Periodontal Disease”’, 2016).

In 2008 CHIBA and TAKAHASHI created ozone Nano bubble water (NBW3) to solve such a problem. NBW3 is used as an adjunctive antiseptic in periodontal treatment due to its bactericidal efficacy and usability.If secured against exposure to UV rays, NBW3 's oxidation potential is maintained for more than 6 months as aqueous ozone. Because of its bactericidal efficacy and usability, NBW3 is used as an adjunctive antiseptic in periodontal treatment.

In-office and home use of ozonated olive oil

A blunt 25-G needle or some other appropriate tip may be used to fill pockets with ozonated olive oil, and repeat the procedure once a week(Piscopo and Poi, 2012).

Peri-implantitis

In peri-implantitis cases, the gaseous or aqueous form of ozone may be used. Cutting a matching piece of PVC or silicone cap fully covers the abutment. There should be proper sealing of the gingival borders around the implant. In this case, infiltrations of ozone gas may be used. The irrigation is provided with ozonated water during debridement and curettage.On the treated areas it may also be advisable to add ozonated oil 3-4 times daily(Wisdom *et al.*, 2020).

Desensitization of sensitive root necks

Repeated ozone spray application for 60 secs followed by mineral wash on the exposed dentine provides rapid and prompt relief from root sensitivity. Smear layer present over the exposed root surfaces prevents the penetration of ionic calcium and fluorine deep into the dentinal tubules.

Working principle of Healozone

Antimicrobial action

Ozone kills bacteria, fungi, and viruses. The mechanism of action includes firstly, the damage to the cytoplasmic membrane of cells as a result of ozonolysis of dual bonds and, secondly, the modification of intracellular contents due to a secondary oxidizing effect resulting in the oxidation of protein loss of organelle function. Because of the antioxidant ability of the human body cells, the action remains non-specific and selective to the microbial cells. All vital functions of bacteria (incapable of developing any autoimmunity) are stopped by the application of ozone in a few seconds. Gram-positive bacteria are more susceptible to ozone action than Gram-negative bacteria.

Immunostimulating effect

The proliferation and synthesis of immunoglobulins by immunocompetent cells are stimulated as an influence of ozone on the cellular and humoral immune systems. The role of macrophages is

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 1267 - 1281
Received 16 February 2021; Accepted 08 March 2021.

triggered as a result of which microorganisms are more responsive to phagocytosis. This further contributes to cytokine development as a consequence of the activation of other immune cells. Ozone synthesizes biologically active substances such as interleukins, prostaglandins, and leukotrienes that help reduce inflammation and cure wounds(Jie *et al.*, 2020).

Anti-hypoxic effect

Ozone leads to a change in cellular metabolism by elevating partial oxygen pressure in tissues and improving oxygen transport in the blood. Some enzymes like dehydrogenase, superoxide dismutases, glutathione peroxidases, and catalases are activated by repeated low doses of ozone.

Biosynthetic effect

Ozone induces protein synthesis pathway activation with increased concentrations of mitochondria and ribosomes in cells resulting in increased cellular activity and ability for tissues and organs to regenerate.

Pros and cons of ozone use

Ozone is used to secrete vasodilators (nitric oxide), which are responsible for the dilation of arterioles and venules. Ozone intensifies the remineralization ability of mineralized tooth tissue as it works on the organic material and often enables the diffusion of calcium and phosphorus ions by opening the dentinal tubules to the deeper layers of carious cavities

Advantages: Fast, non-invasive, it reduces dental phobia with less time consumption.

Disadvantages: Ozone toxicity if the level increases, not readily available, to 0.0007 percent per application.

Contraindications:Acute intoxication with alcohol, pregnancy, severe anemia, recent myocardial infarction, hyperthyroidism, active bleeding and thrombocytopenia

Recent advances in dentistry

HealOzone is a fast, simple, and painless way to get rid of tooth decay. HealOzone is effective because it contains ozone (O_3), a rising natural gas that destroys bacteria and fungus effectively. HealOzone is a perfect tool for identifying and getting rid of any early signs of tooth decay before it progresses further.

Healozone treatment is more in contrast to the current traditional therapeutic modalities as it is a minimally invasive and conservative approach, very inexpensive, painless therapy which increases patient's acceptance and compliance with minimal adverse effects. Nevertheless, further work is still needed to support daily ozone uses in dentistry. The main aim of our study is to know the use of healozone in curing dental caries, various other applications and their mechanism of action. Many studie has to be carried out to analyse whether ozone therapy can be used in other fields to treat nerve injury and tumours and cystic lesions(Shenoy and Brundha, 2016)

CONCLUSION

Earlier people used to tremble at the thought of going to a dentist for the sake of their tooth's health and in case the situation hadn't gotten worse into a dental cavity, it had turned into a nightmare for the patients. But with the introduction of the new and unique method of treating dental caries with the use of ozone has put such traumatizing thoughts of dental visits to rest.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 1267 - 1281
Received 16 February 2021; Accepted 08 March 2021.

Healozone is one such ozone therapy in dentistry that does not cause any pain or restlessness during the treatment of dental caries. It's not just painless, it's inexpensive too. Hence an ideal option to the patients when compared to the unbearably painful drilling of the affected tooth. Because of Healozone being such a perfect option comparatively it is practiced widely among many established dentists to provide a better treatment experience for the patients.

REFERENCES

1. Alpan, A. L. and Bakar, O. (2018) 'Ozone in Dentistry', Ozone in Nature and Practice. doi: 10.5772/intechopen.75829.
2. Ariga, P. et al. (2018) 'Determination of correlation of width of Maxillary Anterior Teeth using Extraoral and Intraoral Factors in Indian Population: A systematic review', World journal of dentistry, 9(1), pp. 68–75. doi: 10.5005/jp-journals-10015-1509.
3. Babando, P. (2017) 'Ozone therapy in dentistry: clinical experiences', Ozone Therapy. doi: 10.4081/ozone.2017.7083.
4. Balaji, S., Brundha, M. P. and Path, D. N. B. (2016) 'Awareness of About Breast Cancer among Dental Surgeons', Research journal of pharmaceutical, biological and chemical sciences, 8(8), p. 797. Available at: https://pdfs.semanticscholar.org/63f4/4173d90b35bffa33eed0aeb52ac547ef1567.pdf.
5. Basha, F. Y. S., Ganapathy, D. and Venugopalan, S. (2018) 'Oral hygiene status among pregnant women', Journal of advanced pharmaceutical technology & research, 11(7), p. 3099. doi: 10.5958/0974-360x.2018.00569.3.
6. Baysan, A. and Lynch, E. (2006) 'The Use of Ozone in Dentistry and Medicine. Part 2. Ozone and Root Caries', Primary Dental Care, pp. 37–41. doi: 10.1308/135576106775193897.
7. Bibby, B. G., Volker, J. F. and Van Kersteren, M. (1942) 'Acid Production and Tooth Decalcification By Oral Bacteria'', Journal of Dental Research, pp. 61–72. doi: 10.1177/00220345420210011001.
8. Brazzelli, M. et al. (2006) 'Systematic review of the effectiveness and cost-effectiveness of HealOzone for the treatment of occlusal pit/fissure caries and root caries', Health technology assessment , 10(16), pp. iii–iv, ix–80. doi: 10.3310/hta10160.
9. Brundha, M. P. (2015) 'A Comparative Study-The Role of Skin and Nerve Biopsy in Hansen's Disease', Research journal of pharmaceutical, biological and chemical sciences. Available at: https://www.researchgate.net/profile/Brundha_Mp/publication/283561218_A_comparative_study-_the_role_of_skin_and_nerve_biopsy_in_hansen's_disease/links/5892ba5d458515aeac946451/A-comparative-study-the-role-of-skin-and-nerve-biopsy-in-hansens-disease.pdf.
10. Brundha, M. P., Pathmashri, V. P. and Sundari, S. (2019) 'Quantitative Changes of Red Blood cells in Cancer Patients under Palliative Radiotherapy-A Retrospective Study', Research Journal of Pharmacy and Technology, p. 687. doi: 10.5958/0974-360x.2019.00122.7.
11. Brundha, M. P. and Saivignesh, S. (2019) 'Myeloid sarcoma', International Journal of Clinicopathological Correlation, p. 41. doi: 10.4103/ijcpc.ijcpc_11_19.
12. Brundha, M. P. and Visha, M. G. (2019) 'A review on ankylosing spondylitis', International Journal of Clinicopathological Correlation, p. 44. doi: 10.4103/ijcpc.ijcpc_12_19.

13. Chandrabhan, D. et al. (2012) 'Isolation of Dental Caries Bacteria from Dental Plaque and Effect of Tooth Pastes on Acidogenic Bacteria', Open Journal of Medical Microbiology, pp. 65–69. doi: 10.4236/ojmm.2012.23009.
14. Chandrasekar, R. et al. (2020) 'Development and validation of a formula for objective assessment of cervical vertebral bone age', Progress in orthodontics, 21(1), p. 38. doi: 10.1186/s40510-020-00338-0.
15. Cheng, R. et al. (2009) 'Dental erosion and severe tooth decay related to soft drinks: a case report and literature review', Journal of Zhejiang University. Science. B, 10(5), pp. 395–399. doi: 10.1631/jzus.B0820245.
16. Cooper, L. F. (2015) 'Prosthodontic complications related to non-optimal dental implant placement', Dental Implant Complications, pp. 539–558. doi: 10.1002/9781119140474.ch24.
17. Diesendorf, M. (1986) 'The mystery of declining tooth decay', Nature, 322(6075), pp. 125–129. doi: 10.1038/322125a0.
18. Dukić, W., Dukić, O. L. and Milardović, S. (2009) 'The influence of Healozone on microleakage and fissure penetration of different sealing materials', Collegium antropologicum, 33(1), pp. 157–162. Available at: https://www.ncbi.nlm.nih.gov/pubmed/19408619.
19. Duraisamy, R. et al. (2019) 'Compatibility of Nonoriginal Abutments With Implants: Evaluation of Microgap at the Implant-Abutment Interface, With Original and Nonoriginal Abutments', Implant dentistry, 28(3), pp. 289–295. doi: 10.1097/ID.0000000000000885.
20. Ezhilarasan, D., Apoorva, V. S. and Ashok Vardhan, N. (2019) 'Syzygium cumini extract induced reactive oxygen species-mediated apoptosis in human oral squamous carcinoma cells', Journal of oral pathology & medicine: official publication of the International Association of Oral Pathologists and the American Academy of Oral Pathology, 48(2), pp. 115–121. doi: 10.1111/jop.12806.
21. Febres, C., Echeverri, E. A. and Keene, H. J. (1997) 'Parental awareness, habits, and social factors and their relationship to baby bottle tooth decay', Pediatric dentistry, 19(1), pp. 22–27. Available at: https://www.ncbi.nlm.nih.gov/pubmed/9048409.
22. Fejerskov, O. and Kidd, E. (2009) Dental Caries: The Disease and Its Clinical Management. John Wiley & Sons. Available at: https://play.google.com/store/books/details?id=fZfXWhSmG1UC.
23. Feng, X. et al. (2020) 'Corrigendum to "Au/SBA-15 catalyst prepared by ozone treatment and importance of negatively charged gold in CO oxidation by DRIFTS"[Chemosphere 250 (2020) 126274]', Chemosphere, 253, p. 126956. doi: 10.1016/j.chemosphere.2020.126956.
24. Gheena, S. and Ezhilarasan, D. (2019) 'Syringic acid triggers reactive oxygen species-mediated cytotoxicity in HepG2 cells', Human& experimental toxicology, 38(6), pp. 694–702. doi: 10.1177/0960327119839173.
25. Hannah, R. et al. (2018) 'Awareness about the use, ethics and scope of dental photography among undergraduate dental students dentist behind the lens', Journal of advanced pharmaceutical technology & research, 11(3), p. 1012. doi: 10.5958/0974-360x.2018.00189.0.
26. Hannah, R. et al. (2019) 'Liquid Paraffin as a Rehydrant for Air Dried Buccal Smear', Research Journal of Pharmacy and Technology, p. 1197. doi: 10.5958/0974-360x.2019.00199.9.

27. Harsha, L. and Brundha, M. P. (2017) 'Prevalence of dental developmental anomalies among men and women and its psychological effect in a given population', Research journal of pharmaceutical, biological and chemical sciences, 9(6), p. 869. Available at: http://search.proquest.com/openview/1f488cc6e377096f44a87e509aceab79/1?pq-origsite=gscholar&cbl=54977.
28. Hema Shree, K. et al. (2019) 'Saliva as a Diagnostic Tool in Oral Squamous Cell Carcinoma - a Systematic Review with Meta Analysis', Pathology oncology research: POR, 25(2), pp. 447–453. doi: 10.1007/s12253-019-00588-2.
29. Hussainy, S. N. et al. (2018) 'Clinical performance of resin-modified glass ionomer cement, flowable composite, and polyacid-modified resin composite in noncarious cervical lesions: One-year follow-up', Journal of conservative dentistry: JCD, 21(5), pp. 510–515. doi: 10.4103/JCD.JCD_51_18.
30. Jain, A. R. et al. (2013) 'Full mouth rehabilitation of a patient with reduced vertical dimension using multiple metal ce ramic restorations', Contemporary clinical dentistry, 4(4), pp. 531–535. doi: 10.4103/0976-237X.123066.
31. Janani, K., Palanivelu, A. and Sandhya, R. (2020) 'Diagnostic accuracy of dental pulse oximeter with customized sensor holder, thermal test and electric pulp test for the evaluation of pulp vitality: an in vivo study', Brazilian dental science, 23(1). doi: 10.14295/bds.2020.v23i1.1805.
32. Jeevanandan, G. and Govindaraju, L. (2018) 'Clinical comparison of Kedo-S paediatric rotary files vs manual instrumentation for root canal preparation in primary molars: a double blinded randomised clinical trial', European archives of paediatric dentistry: official journal of the European Academy of Paediatric Dentistry, 19(4), pp. 273–278. doi: 10.1007/s40368-018-0356-6.
33. Jie, D. et al. (2020) 'Immunostimulating effect of polysaccharides isolated from Ma-Nuo-Xi decoction in cyclophosphamide-immunosuppressed mice', International journal of biological macromolecules, 146, pp. 45–52. doi: 10.1016/j.ijbiomac.2019.12.042.
34. John, D. A. and Brundha, M. P. (2016) 'Awareness of Vitamin A Deficiency among Middle Aged Men-Research', Vitamins & Minerals. doi: 10.4172/2376-1318.1000144.
35. Johnson, J. et al. (2020) 'Computational identification of MiRNA-7110 from pulmonary arterial hypertension (PAH) ESTs: a new microRNA that links diabetes and PAH', Hypertension research: official journal of the Japanese Society of Hypertension, 43(4), pp. 360–362. doi: 10.1038/s41440-019-0369-5.
36. Jose, J., Ajitha and Subbaiyan, H. (2020) 'Different treatment modalities followed by dental practitioners for Ellis class 2 fracture – A questionnaire-based survey', The open dentistry journal, 14(1), pp. 59–65. doi: 10.2174/1874210602014010059.
37. Kalaiselvi, R. and Brundha, M. P. (2016) 'Prevalence of hysterectomy in South Indian population', Research Journal of Pharmacy and Technology, p. 1941. doi: 10.5958/0974-360x.2016.00398.x.
38. Kannan, A. and Venugopalan, S. (2018) 'A systematic review on the effect of use of impregnated retraction cords on gingiva', Journal of advanced pharmaceutical technology & research, 11(5), p. 2121. doi: 10.5958/0974-360x.2018.00393.1.
39. Kaur, K. (2019) 'Brushing Teeth', Brushing Teeth, pp. 1–6. doi: 10.4324/9780429323492-1.
40. Kidd, E. (2005) Essentials of Dental Caries: The Disease and Its Management, 3rd Ed.: The Disease and Its Management. OUP Oxford. Available at: https://play.google.com/store/books/details?id=M9w6j2bli_EC.

41. Kmietowicz, Z. (2014) 'Reduce sugar intake to 3% to protect against tooth decay, say researchers', BMJ, pp. g5622–g5622. doi: 10.1136/bmj.g5622.
42. Kumar, D. and Antony, S. D. P. (2018) 'Calcified canal and negotiation-A review', Journal of advanced pharmaceutical technology & research, 11(8), p. 3727. doi: 10.5958/0974-360x.2018.00683.2.
43. Kumar, M. D. A., Ashok Kumar, M. D. and Brundha, M. P. (2016) 'Awareness about nocturia-A questionnaire survey', Research Journal of Pharmacy and Technology, p. 1707. doi: 10.5958/0974-360x.2016.00344.9.
44. Yang, G., Lucas, R., Caldwell, R., Yao, L., Romero, M., Caldwell, R.Novel mechanisms of endothelial dysfunction in diabetes(2010) Journal of Cardiovascular Disease Research, 1 (2), pp. 59-63. DOI: 10.4103/0975-3583.64432
45. Libonati, A. et al. (2019) 'Clinical antibacterial effectiveness Healozone Technology after incomplete caries removal', European journal of paediatric dentistry: official journal of European Academy of Paediatric Dentistry, 20(1), pp. 73–78. doi: 10.23804/ejpd.2019.20.01.14.
46. Li, F. et al. (2014) 'Evaluation of antibacterial and remineralizing nanocomposite and adhesive in rat tooth cavity model', Acta biomaterialia, 10(6), pp. 2804–2813. doi: 10.1016/j.actbio.2014.02.033.
47. Lynch, D. et al. (2004) 'Successful treatment of caries using the Healozone', Part1. Dental Horizons.
48. Lynch, E. (2004) Ozone: The Revolution in Dentistry. Quintessence. Available at: https://play.google.com/store/books/details?id=gxVqAAAAMAAJ.
49. Manohar, M. P. and Sharma, S. (2018) 'A survey of the knowledge, attitude, and awareness about the principal choice of intracanal medicaments among the general dental practitioners and nonendodontic specialists', Indian journal of dental research: official publication of Indian Society for Dental Research, 29(6), pp. 716–720. doi: 10.4103/ijdr.IJDR_716_16.
50. Marsh, P. D. (1994) 'Microbial ecology of dental plaque and its significance in health and disease', Advances in dental research, 8(2), pp. 263–271. doi: 10.1177/08959374940080022001.
51. Mathew, M. G. et al. (2020) 'Evaluation of adhesion of Streptococcus mutans, plaque accumulation on zirconia and stainless steel crowns, and surrounding gingival inflammation in primary molars: Randomized controlled trial', Clinical oral investigations, pp. 1–6. Available at: https://link.springer.com/article/10.1007/s00784-020-03204-9.
52. McKenna, D. F., Borzabadi-Farahani, A. and Lynch, E. (2013) 'The effect of subgingival ozone and/or hydrogen peroxide on the development of peri-implant mucositis: a double-blind randomized controlled trial', The International journal of oral & maxillofacial implants, 28(6), pp. 1483–1489. doi: 10.11607/jomi.3168.
53. Menon, S. et al. (2018) 'Selenium nanoparticles: A potent chemotherapeutic agent and an elucidation of its mechanism', Colloids and surfaces. B, Biointerfaces, 170, pp. 280–292. doi: 10.1016/j.colsurfb.2018.06.006.
54. Mitchell, T. J. (2003) 'The pathogenesis of streptococcal infections: from tooth decay to meningitis', Nature reviews. Microbiology, 1(3), pp. 219–230. doi: 10.1038/nrmicro771.
55. MohammadSadeghi, A. et al. (2020) 'Pharmacotherapy for reducing saliva and droplet production in airborne procedures may help to decrease the COVID-19 transmission: a hypothesis', Medical Hypotheses, p. 109874. doi: 10.1016/j.mehy.2020.109874.

56. Mp, B., Brundha, M. P. and Nallaswamy, D. (2019) 'Hide and seek in pathology- A research on game-based histopathology learning', International Journal of Research in Pharmaceutical Sciences, pp. 1410–1414. doi: 10.26452/ijrps.v10i2.606.
57. Murata, Y. (2003) 'A Case Report of Anterior Tooth Restoration in Combination with Minor Tooth Movement and Surgical Crown Lengthening', Nihon Hotetsu Shika Gakkai Zasshi, pp. 369–370. doi: 10.2186/jjps.47.369.
58. Murphy, C. H., Jin, J. and Zehnder, J. L. (2020) 'Antiphospholipid Antibodies in Patients With Lupus Anticoagulant Prozone Effect', American journal of clinical pathology, 153(2), pp. 229–234. doi: 10.1093/ajcp/aqz151.
59. Nandakumar, M. and Nasim, I. (2018) 'Comparative evaluation of grape seed and cranberry extracts in preventing enamel erosion: An optical emission spectrometric analysis', Journal of conservative dentistry: JCD, 21(5), pp. 516–520. doi: 10.4103/JCD.JCD_110_18.
60. Nandhini, J. S. T., Babu, K. Y. and Mohanraj, K. G. (2018) 'Size, shape, prominence and localization of gerdy's tubercle in dry human tibial bones', Journal of advanced pharmaceutical technology & research, 11(8), p. 3604. doi: 10.5958/0974-360x.2018.00663.7.
61. '"Ozone Nano Bubble Water: A Magic Wand for the Treatment of Periodontal Disease"' (2016) ARC Journal of Dental Science, 1(3). doi: 10.20431/2456-0030.0103001.
62. Pashley, D. H. (1985) 'Method of decreasing the permeability of a dental cavity', US Patent. Available at: https://patentimages.storage.googleapis.com/4f/b0/55/57a47eb2441349/US4538990.pdf (Accessed: 4 June 2020).
63. Pc, J., Marimuthu, T. and Devadoss, P. (2018) 'Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study', Clinical implant dentistry and related research. Available at: https://europepmc.org/article/med/29624863.
64. Pellico, M. A. (1988) 'Method for treating teeth with foamable fluoride compositions', US Patent. Available at: https://patentimages.storage.googleapis.com/ef/88/62/15dd4629149c27/US4770634.pdf (Accessed: 4 June 2020).
65. Piscopo, A. and Poi, M. (2012) 'Packaging and Storage of Olive Oil', Olive Germplasm - The Olive Cultivation, Table Olive and Olive Oil Industry in Italy. doi: 10.5772/51827.
66. Pitts, N. (2016) 'Understanding Dental Caries – from Pathogenesis to Prevention and Therapy', Understanding Dental Caries, pp. 3–9. doi: 10.1007/978-3-319-30552-3_1.
67. P Jannathulferdioz, B. M. (no date) 'Awareness of Stye', Int. J. Pharm. Sci. Rev. Res., 40(1), pp. 30–32.
68. Prashaanthi, N. and Brundha, M. P. (2018) 'A Comparative Study between Popplet Notes and Conventional Notes for Learning Pathology', Research Journal of Pharmacy and Technology, p. 175. doi: 10.5958/0974-360x.2018.00032.x.
69. Preethikaa, S. and Brundha, M. P. (2018) 'Awareness of diabetes mellitus among general population', Research Journal of Pharmacy and Technology, p. 1825. doi: 10.5958/0974-360x.2018.00339.6.
70. Rajakeerthi and Ms, N. (2019) 'Natural Product as the Storage medium for an avulsed tooth – A Systematic Review', Cumhuriyet Üniversitesi Diş Hekimliği Fakültesi dergisi, 22(2), pp. 249–256. doi: 10.7126/cumudj.525182.
71. Rajendran, R. et al. (2019) 'Comparative evaluation of remineralizing potential of a paste containing bioactive glass and a topical cream containing casein phosphopeptide-

amorphous calcium phosphate: An in vitro study', Pesquisa brasileira em odontopediatria e clinica integrada, 19(1), pp. 1–10. doi: 10.4034/pboci.2019.191.61.
72. Ramadurai, N. et al. (2019) 'Effectiveness of 2% Articaine as an anesthetic agent in children: randomized controlled trial', Clinical oral investigations, 23(9), pp. 3543–3550. doi: 10.1007/s00784-018-2775-5.
73. Ramesh, A. et al. (2018) 'Comparative estimation of sulfiredoxin levels between chronic periodontitis and healthy patients - A case-control study', Journal of periodontology, 89(10), pp. 1241–1248. doi: 10.1002/JPER.17-0445.
74. Ravichandran, H. and Brundha, M. P. (2016) 'Awareness about personal protective equipments in hospital workers (sweepers and cleaners)', International Journal of Pharmaceutical Sciences Review and Research, 40(1), pp. 28–29.
75. Ravinthar, K. and Jayalakshmi (2018) 'Recent advancements in laminates and veneers in dentistry', Journal of advanced pharmaceutical technology & research, 11(2), p. 785. doi: 10.5958/0974-360x.2018.00148.8.
76. R, H. et al. (2020) 'CYP2 C9 polymorphism among patients with oral squamous cell carcinoma and its role in altering the metabolism of benzo[a]pyrene', Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology, pp. 306–312. doi: 10.1016/j.oooo.2020.06.021.
77. Samuel, S. R. (2021) 'Can 5-year-olds sensibly self-report the impact of developmental enamel defects on their quality of life?', International journal of paediatric dentistry / the British Paedodontic Society [and] the International Association of Dentistry for Children, 31(2), pp. 285–286. doi: 10.1111/ipd.12662.
78. Sekar, D. et al. (2019) 'Methylation-dependent circulating microRNA 510 in preeclampsia patients', Hypertension research: official journal of the Japanese Society of Hypertension, 42(10), pp. 1647–1648. doi: 10.1038/s41440-019-0269-8.
79. Seppan, P. et al. (2018) 'Therapeutic potential of Mucuna pruriens (Linn.) on ageing induced damage in dorsal nerve of the penis and its implication on erectile function: an experimental study using albino rats', The aging male: the official journal of the International Society for the Study of the Aging Male, pp. 1–14. doi: 10.1080/13685538.2018.1439005.
80. Sharma, P. et al. (2019) 'Emerging trends in the novel drug delivery approaches for the treatment of lung cancer', Chemico-biological interactions, 309, p. 108720. doi: 10.1016/j.cbi.2019.06.033.
81. Shenoy, P. B. and Brundha, M. P. (2016) 'Awareness of polycystic ovarian disease among females of age group 18-30 years', Research journal of pharmaceutical, biological and chemical sciences, 8(8), p. 813. Available at: http://search.proquest.com/openview/a8a09e7b2e9d2f967bf3fee479c7018a/1?pq-origsite=gscholar&cbl=54977.
82. Shreya, S. and Brundha, M. P. (2017) 'Alteration of Haemoglobin Value in Relation to Age, Sex and Dental Diseases-A Retrospective Correlation Study', Research Journal of Pharmacy and Technology, p. 1363. doi: 10.5958/0974-360x.2017.00241.4.
83. Siddique, R. et al. (2019) 'Qualitative and quantitative analysis of precipitate formation following interaction of chlorhexidine with sodium hypochlorite, neem, and tulsi', Journal of conservative dentistry: JCD, 22(1), pp. 40–47. doi: 10.4103/JCD.JCD_284_18.
84. Silva da Cruz, A. J. et al. (2020) 'Dental Caries Remains a Significant Public Health Problem for South American Indigenous People', The journal of evidence-based dental practice, 20(2), p. 101418. doi: 10.1016/j.jebdp.2020.101418.

Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 3, 2021, Pages. 1267 - 1281
Received 16 February 2021; Accepted 08 March 2021.

85. Sridharan, G. et al. (2019) 'Evaluation of salivary metabolomics in oral leukoplakia and oral squamous cell carcinoma', Journal of oral pathology & medicine: official publication of the International Association of Oral Pathologists and the American Academy of Oral Pathology, 48(4), pp. 299–306. doi: 10.1111/jop.12835.
86. Swetha, S. and Brundha, M. P. (2017) 'Analysis of knowledge about the hospital warning symbols among the postgraduate dental students-A comparative study', Research Journal of Pharmacy and Technology, p. 975. doi: 10.5958/0974-360x.2017.00177.9.
87. Teja, K. V., Ramesh, S. and Priya, V. (2018) 'Regulation of matrix metalloproteinase-3 gene expression in inflammation: A molecular study', Journal of conservative dentistry: JCD, 21(6), pp. 592–596. doi: 10.4103/JCD.JCD_154_18.
88. Tian, Y. et al. (2015) 'Mechanistic insights into perovskite photoluminescence enhancement: light curing with oxygen can boost yield thousandfold', Physical chemistry chemical physics: PCCP, 17(38), pp. 24978–24987. doi: 10.1039/c5cp04410c.
89. Timothy, C. N., Samyuktha, P. S. and Brundha, M. P. (2019) 'Dental pulp Stem Cells in Regenerative Medicine – A Literature Review', Research Journal of Pharmacy and Technology, p. 4052. doi: 10.5958/0974-360x.2019.00698.x.
90. Vieira, G. C. S. et al. (2020) 'Impact of Contracted Endodontic Cavities on Root Canal Disinfection and Shaping', Journal of endodontia, 46(5), pp. 655–661. doi: 10.1016/j.joen.2020.02.002.
91. Vijayashree Priyadharsini, J. (2019) 'In silico validation of the non-antibiotic drugs acetaminophen and ibuprofen as antibacterial agents against red complex pathogens', Journal of periodontology, 90(12), pp. 1441–1448. doi: 10.1002/JPER.18-0673.
92. Vijayashree Priyadharsini, J., Smiline Girija, A. S. and Paramasivam, A. (2018) 'In silico analysis of virulence genes in an emerging dental pathogen A. baumannii and related species', Archives of oral biology, 94, pp. 93–98. doi: 10.1016/j.archoralbio.2018.07.001.
93. Wisdom, E. C. et al. (2020) 'Mitigation of peri-implantitis by rational design of bifunctional peptides with antimicrobial properties', ACS biomaterials science & engineering, 6(5), pp. 2682–2695. doi: 10.1021/acsbiomaterials.9b01213.
94. Yalavarthi, S., Nallaswamy, D. and Jain, A. (2018) 'Resistance to Oral Pathogens Among Dentures Wearers', Journal of Pure and Applied Microbiology, pp. 961–967. doi: 10.22207/jpam.12.2.59.
95. Zanjani, V. A. et al. (2015) 'Bleaching effect of ozone on pigmented teeth', Dental research journal, 12(1), pp. 20–24. doi: 10.4103/1735-3327.150295.
96. Ziskin, D. E. (1926) 'The incidence of dental caries in pregnant women', American Journal of Obstetrics and Gynecology, pp. 710–719. doi: 10.1016/s0002-9378(26)90374-8.
97. Лукашевич, И. et al. (2017) 'PECULIARITIES OF THE COURSE OF DENTAL CARIES IN PREGNANT WOMEN OF DIFFERENT AGE', Acta biomedica scientifica, pp. 23–26. doi: 10.12737/article_59f0360a019378.13188301.