

Importance of Photodynamic Therapy (PDT) in the Endodontic Treatment of Deciduous Teeth

Georgios K Schwarz*

Department of Periodontology, Cariology and Preventive Dentistry, University of Bonn, Bonn, Germany

Received: 19-Aug-2022, Manuscript No. OHDM-22-18215; **Editor assigned:** 22-Aug-2022, Pre QC No. OHDM-22-18215 (PQ); **Reviewed:** 05-Sep-2022, QC No. OHDM-22-18215; **Revised:** 12-Sep-2022, Manuscript No. OHDM-22-18215 (R); **Published:** 19-Sep-2022, DOI: 10.35248/2247-2452.22.21.1016.

Description

With the development of laser therapy, children now have an access to quicker, more comfortable, and effective dental operations. It is quickly gaining acceptance and has completely changed how restorative and surgical dentistry are practised. Another area where its significance is quickly growing is the endodontic treatment of deciduous teeth. Laser therapy has a specific place in the endodontic care of deciduous teeth because it not only preserves the health of the teeth and supporting tissues but also the structural integrity of the dental arch until its natural exfoliation. It is very difficult to get maximally sterile root canals before obturation, which is practically impossible with merely instrumentation and irrigation, during the endodontic treatment of deciduous teeth.

When Oscar Raab reported on the fatal effects of acridine hydrochloride on *Paramecia caudatum*, it was more than 100 years ago that the use of Photodynamic Therapy (PDT) for the inactivation of microorganisms was first proven. Photodynamic therapy is used to treat various diseases based on the idea of nontoxic photosensitizers that can be preferentially localised in specific tissues and then activated by light of the right wavelength to produce singlet oxygen and free radicals that are cytotoxic to cells of the target tissue. Despite of efforts in the direction and awareness of significance in the deciduous dentition's health, and improvements in prevention, the incidence and prevalence of tooth decay have decreased there are still a lot of deep carious lesions in children where the disease is polarised and involves the pulp. Around 75% of primary teeth with moderate to severe carious process have pulp involvement. This is caused by primary teeth having weaker dentin and enamel compared to permanent teeth, as well as less enamel mineralization. There are also noticeable pulp horns under the cusps, a reduced vestibular-lingual distance between them, and significant neck constriction in these teeth.

In fact, paediatric dentistry sees a high occurrence of traumatic injuries, particularly to the anterior teeth. This became a major concern because of the pulpal involvement that typically results, along with the patient's emotional well-being and professional futures. Due to the unique pulpal biological cycle and internal structure of primary teeth, which are characterised by caries or damage, their maintenance can be of significant therapeutic challenge in pediatric dentistry. As a result, there is a need for sanitizers for root canal procedures that have a high performance in eliminating bacteria, since this leads to success. The majority of endodontic treatment

failures are caused by microorganisms that persisted after the chemomechanical preparation, medicines, and dressings. Based on the idea that a non-toxic dye known as photosensitizer can be activated by modest quantities of visible light and an appropriate wavelength to generate singlet oxygen and free radicals which are deadly to bacterial cells, the photodynamic antimicrobial therapy was developed. When combined with a low-intensity laser, blue dyes, particularly toluidine and methylene blue, are efficient at killing germs. In some trials, photodynamic treatment has been utilised in combination with mechanical-chemical root canal preparation to support the removal of bacteria. The PDT can then be used as an adjunct therapy in the endodontic treatment of deciduous teeth to diminish the microbiota. These highly reactive chemical species have the potential to harm biological components such as proteins, lipids, nucleic acids, and others.

In deciduous teeth, the pathological pulp processes are frequently discovered. In these processes Streptococci were measured 96.7% of cases, black-pigmented bacilli in 35.5% of cases, aerobic microorganisms in 93.5% of cases, and *S. mutans* in 48.4% of cases, forming a polymicrobial etiology infection. The presence of irregular root resorption, microbial resistance following endodontic treatment, the presence of accessory foramina, a lower tolerance for prolonged treatment, movement of the child during access to the canal, lack of cooperation from child during care, instrumentation, and filling are common challenges in conventional endodontic treatments. Additionally, some studies have shown that removing germs from the infection process is insufficient when simply mechanical instruments and root canal irrigation are used. Therefore, it's crucial to employ extra methods that could boost antibacterial action. According to various studies, photodynamic therapy can help endodontists treat deciduous teeth, significantly reducing the amount of bacteria found in deciduous teeth with necrotic pulp.

Conclusion

In addition to traditional endodontic therapy, the use of photosensitizing dye with a low-intensity laser looks to be a effective, inexpensive, and painless alternative. A considerable decrease in the overall number of germs in primary teeth with necrotic pulp can also be achieved by using antimicrobial photodynamic therapy as an adjunct in the endodontic treatment of primary teeth. Applications of PDT in dentistry are expanding quickly, including therapy for bacterial and fungal infections along with the treatment of oral cancer.