CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.1321263

Available online at: http://www.iajps.com Research Article

EXPERIENCE IN THE USE OF PHOTOACTIVATED DISINFECTION OF CARIOUS CAVITIES BY TOLONIUM CHLORIDE IN THE TREATMENT OF DEEP CARIOUS LESIONS OF DENTIN

[1]Razumova S.N., [2]Aymaletdinova Z.T., [3]Ivanova E.V., [4]Saleeva G.T., [5]Saleev R.D.

[1] Professor, Peoples Friendship University of Russia, Moscow

[2]Peoples Friendship University of Russia, Moscow

[3]Russian Medical Academy of Postgraduate Education, Therapeutic Dentistry Department, Moscow

[4]Professor, Kazan State Medical University of the Ministry of Health of the Russian Federation, Prosthetic Dentistry Department, Kazan

[5]Professor, Kazan State Medical University of the Ministry of Health of the Russian Federation, Prosthetic Dentistry Department, Kazan

Abstract:

The prevalence of caries among the adult population of the Earth, according to WHO, exceeds 90% and, as a rule, teeth of the chewing group are primarily affected because of their anatomical structure. A pilot study of the use of photoactivated disinfection of carious cavities with a solution of tolonium chloride showed high efficiency in the prevention of complications in the treatment of deep carious lesions of dentin.

Key words: *tooth decay, photoactivated disinfection, prevention, dentistry*

*** Corresponding author:**

Aymaletdinova Z.T,

Peoples Friendship University of Russia, Moscow

QR code

Please cite this article in press Aymaletdinova Z.T et al., ***Experience in the Use of Photoactivated Disinfection of Carious Cavities By tolonium Chloride in the Treatment of Deep Carious Lesions of Dentin.,*** *Indo Am. J. P. Sci, 2018; 05(07).*

INTRODUCTION:

The prevalence of caries among the adult population of the Earth, according to WHO, exceeds 90% and, as a rule, teeth of the chewing group are affected primarily because of their anatomical structure. Among the new methods of treatment of dental diseases, photodynamic therapy occupies a well-deserved place. Photodynamic therapy is based on the use of various photobiological effects caused by the combined use of light, oxygen and a photosensitizer. In the clinic of therapeutic dentistry, the use of photodynamic therapy is due, first of all, to the need to influence various microorganisms that cause or contribute to the development of various inflammatory diseases. Also, the physiotherapeutic effect of laser radiation, realized by means of a mild localized rise in temperature, makes it possible to improve the efficiency of treatment.

Figure 1: The device of photodynamic therapy

The **aim** of the study was to determine the effectiveness of using the Lazurit diode laser device in the treatment of unspecified (deep) caries (K02.9).

MATERIALS AND METHODS:

The study involved 40 patients aged 25-55 years who underwent treatment for deep caries without pulpitis symptoms (K02.9 caries, unspecified) in 1st Black class on molars of the lower jaw with EPT not exceeding 15 μA. All patients before the start of treatment were assessed functional status (assessment of heart rate, blood pressure). Exclusion criteria were: acute pulpitis (K04.0) of the teeth; decompensated states; refusal to participate in the study; oncological diseases.

Evaluation of the efficiency of photoactivated disinfection was determined according to the Citotest system: the immediate after the etching step, the cytological material was taken from the surface of the prepared carious cavity, and after irradiation with the Lazurit system. The results were counted in absolute scale.

Figure 2: Transport environment

Lazurit PAD® is a photoactivated disinfection that is used to improve the long-term results of restorations in the treatment of caries and in endodontic treatment by destroying all kinds of bacteria in the oral cavity, which allows to preserve demineralized tooth tissues and accelerate natural remineralization. This technology includes two elements: a medical solution of tolonium chloride in low concentration and the device is a source of red light radiation of a certain wavelength for activation of the solution. Once introduced into the tooth tissues, molecules from the solution of tolonium chloride attach to all the pathogens located there. After the solution is activated by light, the molecules of tolonium chloride begin to release extremely active atomic oxygen, which "breaks through" the walls of pathogens, penetrating into the nucleus of the cell, destroying them.

After the formation of the cavity, etching was carried out and, according to a standard procedure, the prepared cavity was irradiated with a Lazurit apparatus at a power of 60 sec / 100 mW, the washing of the cavity after disinfection was performed with sterile water. Further restoration was carried out using an adhesive technique followed by restoration with a nanohybrid composite "Restavrin" (Technodent). Evaluation of the viability of the tooth was carried out with EPT after 1,2,3 and 6 months. The data were statistically processed using the Medstat program.

RESULTS OF THE STUDY:

It was shown that in normotonics (22 patients-55%) the parameters of EPT in unspecified caries were 10 ± 0.2 μA; in hypertensive patients (11 patients - 27.5%) - 14 μA; in hypotonic patients (7 patients - 17.5%) - 9 ± 0.1 μA. Thus, on average, the EPT indices in case of unspecified caries before treatment were 11 μA.

In the evaluation of the biomaterial before the use of photoactivated disinfection in 37 patients (92.5%), the cases were determined S. mutans and L. Casei. The data obtained by us on the viability of cultures after treatment with this method allows us to draw the following conclusions: Lazurit technology has a pronounced antimicrobial effect on S. mutans and L. Casei, since when the test was repeated after irradiation, the result was negative.

The dynamics of the change in EPT indices made up the reduction of indicators by 6 months in 38 patients (95%). Two patients with high blood pressure experienced a negative result in the form of classical pulpitis symptoms one day after treatment and an increase in EPT values to 45 ± 0.4 μA. Indirectly, this may indicate a restriction of the use of this method for deep dentin damage in patients with elevated blood pressure, but a small sample does not allow reliable results.

CONCLUSION:

A pilot study of the use of photoactivated disinfection of carious cavities with a solution of tolonium chloride showed high efficiency in the prevention of complications in the treatment of deep carious lesions of dentin.

REFERENCES:

1. Rabinovich S.A., Razumova S.N., VasilievYu.L.. Functional cardiovascular assessment in dentists performing local anesthesia in out-patient settings. Stomatologiya. 2017. T. 96. № 1. C. 20-22. DOI: 10.17116/stomat 201796120-22
2. Разумова С.Н., Гапочкина Л.Л., Брагунова Р.М., Браго А.С., Хасханова Л.М., Манвелян А.С. Оценка влияния антимикробной добавки на свойства композита. Медицинский алфавит. 2017. Т. 4. № 36 (333). С. 24-27.
3. Vasil'evYu.L et al., The effectiveness of the use

of therapeutic toothpastes in order to increase the humidity of the mouth in patients with radio-induced xerostomia, Indo Am. J. P. Sci, 2018; 05(07).

4. Ornellas PO, Antunes LS, Motta PC, Mendonça C, Póvoa H, Fontes K, Iorio N, Antunes LAA. Antimicrobial photodynamic therapy as an adjunct for clinical partial removal of deciduous carious tissue: a minimally invasive approach. Photochem Photobiol. 2018 Jun 20. doi: 10.1111/php.12966
5. Разумова С.Н., Селифанова Е.И., Васильев Ю.Л., Слюсар О.И., Аймалетдинова З.Т., Фомина А.Д. Сравнение степени насыщения фтором эмали зуба после применения различных фторидсодержащих препаратов аналитическим методом. Современные проблемы науки и образования. 2017. № 5. С. 20.
6. Pockpa AD, Soueidan A, Louis P, Coulibaly NT, Badran Z, Struillou X. Twenty years of full-mouth disinfection: the past, the present and the future. Open Dent J. 2018 May 31;12:435-442. doi: 10.2174/1874210601812010435
7. Madani L, Sarkisians E, Kiomarsi N, Fard MJK, Chiniforush N. Effect of antimicrobial photodynamic therapy on microleakage of class v cavities restored with composite resin. Photodiagnosis Photodyn Ther. 2018 Jun 12. pii: S1572-1000(18)30042-5. doi: 10.1016/j.pdpdt.2018.06.010.