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## PRIMENA MEKIH LASERA U TERAPIJI HERPES LABIALISA pilot studija

### APPLICATION OF SOFT LASER IN THE TREATMENT OF HERPES LABIALIS - pilot study

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#### Sažetak

**Uvod:** Zbog pozitivnih biostimulativnih efekata, meki laser se koristi za lečenje brojnih bolnih stanja u usnoj duplji. Jedna od njih je herpes labialis.

**Cilj:** Cilj ovog rada bio je ispitati efikasnost mekih lasera u terapiji herpes labialis.

**Materijal i metod rada:** U ispitivanju je učestvovalo 43 pacijenta. Kod 23 pacijenta primenjena je laseroterapija, a kod preostalih 20 standardna terapija Aciclovikom u obliku masti.

**Rezultati:** Nivo statističke značajnosti razlika srednjih vrednosti bola između grupa bio je maksimalan ( $p < 0,001$ ). Pacijenti sa herpesnim lezijama imali su koristi od laseroterapije u smislu skraćivanja progresije oboljenja, simptomi u vidu bola, peckanja, žarenja svedeni su na minimum. Ispitanici tretirani laserom imali su statistički značajno manju srednju vrednost bola u odnosu na ispitanike tretirane Aciclovikom ( $p < 0,05$ ).

**Zaključak:** Na osnovu dobijenih rezultata može se zaključiti da se meki laser pokazao kao efikasna terapijska metoda u lečenju herpes labialis, pa se preporučuje u tretmanima.

**Ključne reči:** meki laser, terapija, herpes labialis

#### Abstract

**Introductio:** Soft laser could be used for the treatment of different painful diseases and conditions in the oral cavity. One of them is Herpes labialis.

**The aim** of the paper was to study the efficiency of soft laser in the treatment of Herpes labialis.

**Material and method:** The study included 43 patients. Laser therapy was applied in 23 patients, whereas 20 patients were treated by Ung. Acyclovir.

**Results:** The level of statistical significance of differences in mean values of pain between the groups was maximum ( $p < 0.001$ ). Patients with herpetic lesions benefit from laser therapy in terms of shortening the progression of the disease, pain, tingling and burning. The patients treated with laser had significantly lower mean value of the pain compared to those treated with Ung. Acyclovir ( $p < 0.05$ ).

**Conclusion:** Based on the obtained results, it can be concluded that the soft laser proved to be an effective therapy in the treatment of Herpes labialis, and, therefore, is recommended in its treatment.

**Key words:** soft laser, therapy, Herpes labialis

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## Uvod

Herpes labialis je virusno oboljenje izazvano Herpes simplex virusom (HSV) koji pripada grupi DNK virusa. Prirodni domaćin HSV je čovek, koji je rezervoar i prenosilac infekcije. Virus se prenosi direktnim kontaktom sa čoveka na čoveka. Period inkubacije je 5-15 dana. Incidencija infekcije HSV je visoka, zahvata preko 90% populacije<sup>1</sup>.

Posle prvog naleta oboljenja, koje može biti neprimetno ili sa blagom kliničkom slikom po tipu tonzilofaringealnih infekcija, HSV može da perzistira u trigeminalnom ganglionu. Mogu da ga aktiviraju brojni faktori, uključujući i groznicu koja prati neka infektivna oboljenja, sunčanje, mehaničku traumu, menstruaciju i psihički stres. Češće oboljevaju žene nego muškarci i odnos je 2:1, gornja ili donja usna su podjednako zahvaćene u 1-2% populacije<sup>1,2</sup>.

Bolest počinje prodromnim simptomima u vidu peckanja, žarenja ili diskretnog bola tamo gde se razvija herpesna lezija. U roku od nekoliko sati javlja se eritem, na kome se razvija buket vezikula. U jednoj grupi može biti 50, pa i do 100 vezikula različite veličine. One su ispunjene bistrim seroznim sadržajem, koji može da se zamuti. Posle par dana vezikule prskaju i iz njih izlazi serozni eksudat koji pravi žućkastu krustu. Po otpadanju kruste ostaje laka hiperpigmentacija, koja se vremenom gubi. Sledeća epizoda može biti na istom ili nekom drugom delu semimukoze.

Sa terapijom je najbolje početi u prodromalnom stadijumu, lokalnom aplikacijom virostatika ili laserom<sup>3-6</sup>.

## Cilj rada

Cilj rada bio je ispitati efikasnost primene mekih (soft, niskoenergetskim, male snage) lasera u terapiji herpesa labialis u poređenju sa tradicionalnom metodom lečenja – Aciklovir mast.

## Materijal i metode rada

Istraživanje je sprovedeno na Klinici za stomatologiju Medicinskog fakulteta Univerziteta u Nišu, na Odeljenju za oralnu medicinu i parodontologiju.

## Introduction

Herpes labialis is a viral disease caused by Herpes simplex virus (HSV), which belongs to a group of DNA viruses. The natural host of HSV is a human who is a reservoir and carrier of the infection. The virus is transmitted by direct contact from person to person. The incubation period is 5-15 days. The incidence of HSV infection is high in over 90% of the population<sup>1</sup>.

After the first wave of the disease, which may be undetectable, or could manifest as tonsil-pharyngeal infection, HSV can persist in Ganglion trigeminale. Numerous factors could be a trigger, including fever, which accompanies some infectious diseases, sun-screen, mechanical injuries, menstrual cycle, psychological stress. Women are affected more than men, in ratio 2:1. The upper or lower lip are equally affected in 1-2% of the population<sup>1,2</sup>.

The disease begins by prodromal symptoms such as itching, burning or pain on the area where the herpetic lesions will develop. Within a few hours, erythema develops, followed by formation of vesicles. In a group, there can be 50 to 100 vesicles different in size. After a few days, vesicles burst, exudate comes out, and a yellowish crust is formed. After crustation, mild hyperpigmentation remains, which disappears over time. The next episode could recur on the same or some other site of mucosa.

For the treatment, local application of viral medicaments as well as soft laser could be used<sup>3-6</sup>.

## The aim of the study

The aim of the study was to examine the efficacy of soft laser in the treatment of herpes labialis in comparison to traditional methods of treatment - acyclovir ointment.

## Material and method

This study was carried out at the Faculty of Medicine University of Niš, Clinic of Dentistry, Department of Oral medicine and Periodontology. Out of 43 patients, 23 patients were diagnosed with Herpes labialis, which was treated by soft laser, and 20 patients were treated by standard, conventional therapy.

U istraživanju je učestvovalo 23 ispitanika sa herpesom labialis, tretiranih niskoenergetskim laserom i 20 pacijenata kod kojih je korišćena standardna, konvencionalna terapija mašću Aciclovir (kontrolna grupa).

U istraživanju je korišćen GaAlAs niskoenergetski laser snage 5mW, talasne dužine 670nm, sa prečnikom sonde od 2mm, koji radi u kontinuiranom režimu. Vreme ekspozicije je četiri minuta.

Vizuelno-analognom skalom za bol (VAS) kod svih pacijenata meren je bol od prvog dana tretmana, ali i kliničko smanjenje eritema, kao i krustracija.

Pored osnovnih statističkih parametara (% , aritmetička sredina, standardna devijacija i standardna greška) korišćen je t-test i  $\chi^2$  test.

### Rezultati rada

Od 43 pacijenta koji su učestvovali u ovom ispitivanju, 28 (65,11%) bilo je ženskog roda, a 15 (34,89%) muškog - tabela 1.

Prosečna starost ovih ispitanika je  $37,86 \pm 15,60$ , uz medijanu od 34,00 godina.

Na početku terapije, studijska i kontrolna grupa se nisu razlikovale u vrednostima bola, definisanom na osnovu VAS skale. Bol je opadao već nakon druge terapijske seanse u obe grupe, da bi u vreme pete seanse potpuno nestao u obe grupe. Evidentno je da je kod oba tipa lezija u periodu od treće do šeste seanse bol znatno izraženiji u kontrolnoj u odnosu na studijsku grupu. Poređenjem vrednosti bola statistički značajno manja vrednost bola je u studijskoj grupi u periodu 3. ( $p < 0,01$ ) i 4. ( $p < 0,05$ ) terapijske seanse.

In the study, we used the GaAlAs soft laser-strength 5mW, wavelength 670nm, with a probe of 2mm in diameter, continuous regime, exposure time of 4 minutes. The pain was "measured" by the Visual Analogous Scale for pain, as well as clinical reduction of erythema and crustration. The basic statistical parameters (% , means, standard deviation and standard error) were used, as well as the t-test and  $\chi^2$  test.

### Results

Out of the 43 patients who participated in this study, 28 (65.11%) were females and 15 (34.89%) were males (Table 1).

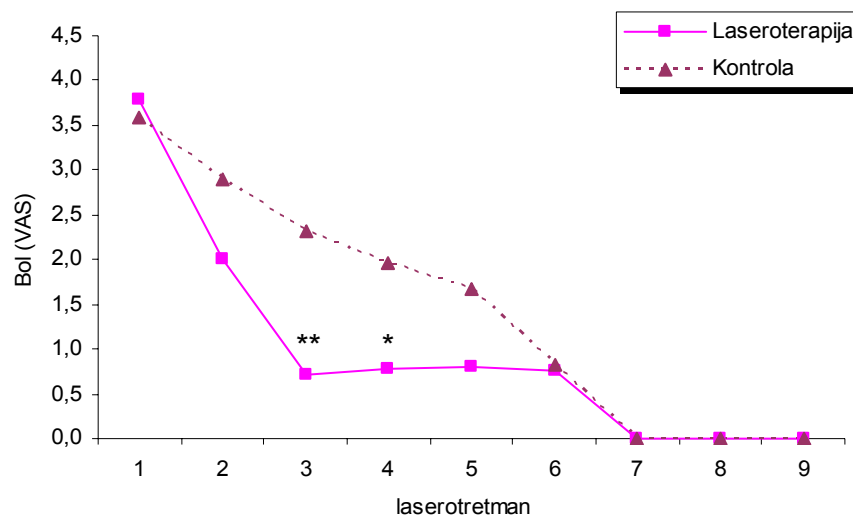
The average age of these patients was  $15,60 \pm 17,86$  years, with a median of 34.00 years.

At the beginning of therapy, the study and control groups did not differ in the value of pain defined using the VAS scale. Pain decreased after the second therapy session in both groups, and at the time of the fifth session completely disappeared in both groups. It is evident that in the period from the third to the sixth session, the pain was significantly more pronounced in the control compared to the study group.

Significantly lower values of pain in the study group were recorded in the third ( $p < 0.01$ ) and fourth ( $p < 0.05$ ) therapy sessions.

Tabela 1. Polna struktura ispitanika  
Table 1. The gender of the respondents

Pol/Gender	Broj pacijenata/Number of Patients
Ženski/Female	28 (65,11%)
Muški/Male	15 (34,89%)
Ukupno/Total	43 (100%)



Herpes labialis (\*  $p < 0,05$ , \*\*  $p < 0,01$ )

**Grafikon 1.** Vrednosti VAS između laseroterapije i standardne terapije kod pacijenata sa labijalnim herpesom.

**Graf 1.** VAS values between laser therapy and standard therapy in patients with herpes labial

## Diskusija

Brojni su podaci iz literature o primeni mekih lasera kod oboljenja mekih tkiva kao što su aphtae, herpes labialis, ulcusi itd.<sup>5-10</sup> Herpes simplex virus-1 infekcija, kao što je već pomenuto, prolazi kroz nekoliko faza. Zanimljivi su rezultati dobijeni primenom lasera u prodromnoj fazi<sup>11</sup>. Tada laseroterapija može izazvati supresiju infekcije i lezije se ne mogu videti<sup>12</sup>. Čak i kada se koristi u kasnijim fazama infekcije, laseroterapija obezbeđuje smanjenje simptoma bola i ubrzava proces zarastanja<sup>11,13-16</sup>. Smatra se da za vreme faze vezikula laseroterapija može ubrzati proliferaciju virusa<sup>17</sup> i izazvati negativan efekat na proces zarastanja lezija.<sup>18</sup> Pošto virusi u ovoj fazi ubrzano proliferišu, a laser povećava sintezu ATPa i nukleinskih kiselina u virusima, preporučeno je da se u ovoj fazi laser ne koristi<sup>19</sup>.

Sa druge strane, ne treba zaboraviti da se imuni sistem takođe nalazi pod uticajem lasera<sup>17,20</sup>. Neki autori sugerišu da imune ćelije protiv HSV-1 virusa takođe proliferišu i aktivne su protiv virusne infekcije<sup>21,22</sup>. De Carvalho et al<sup>21</sup> koriste laseroterapiju nezavisno od faze bolesti i pokazuju prisutno smanjenje edema i veličine lezije. Vélez-González et al<sup>25</sup> primenjuju laser posle dijagnostike i potvrđuju da nema nuz efekata posle zračenja bez obzira na fazu bolesti.

## Discussion

Literature data relating to the application soft lasers in soft tissue diseases such as aphtae, herpes labialis, ulcer, etc. are extensive<sup>5-10</sup>. Herpes simplex virus 1 infection passes through several phases. Interesting results were obtained when the laser was used in the prodromal phase<sup>11</sup>. Then, laser therapy can cause suppression of infection and lesions cannot be seen<sup>12</sup>. Even when it is used in the later stages of infection, laser therapy provides a pain reduction, and accelerates the healing process<sup>11,13-16</sup>. It is believed that during the vesicle phase, laser therapy can accelerate the virus proliferation<sup>17</sup> and cause an adverse effect on the process of healing of the lesion<sup>18</sup>. As the viruses rapidly proliferates at this stage, and laser increases the synthesis of ATP and nucleic acids in viruses, the use of laser is not recommended in this stage<sup>19</sup>.

On the other hand, one should bear in mind that the immune system is also under the influence of the laser<sup>17,20</sup>. Some authors suggest that immune cells against the HSV-1 virus are also proliferating, and they are active against a viral infection<sup>21,22</sup>. De Carvalho et al<sup>21</sup> used laser independently of the stage of the disease and the results showed the reduction of edema, and the size of the lesion. Vélez-González et al<sup>25</sup> applied laser after establishing the diagnosis and

Rezultati ovog rada pokazuju dobar analgetski efekat mekih lasera, što je u saglasnosti sa rezultatima drugih autora<sup>5,7-10</sup>. Naime, ispitanici tretirani laserom imali su statistički značajno manju srednju vrednost bola u odnosu na ispitanike tretirane Acicloviro (p<0,05).

Kada su u pitanju preventivni efekti laseroterapije, ona se može koristiti za vreme latentne faze kada nema prisutnih znakova infekcije, a povećanje intervala između pojave novog herpetičnog napada se povećava<sup>23,24</sup>. Dakle, laserska svetlost se koristi kako u prodromalnoj fazi da bi se smanjila ekstenzija lezija tako i u latentnoj fazi za povećanje intervala između dva recidiva. Laser se može koristiti i u fazi krusta kako bi se ubrzalo zarašćivanje. Glavna prednost laserske terapije je što nema sporednih i negativnih efekata, interakcije sa lekovima, te je naročito primenljiv kod starih i imunokompromitovanih osoba.

### **Zaključak**

Ispitanici tretirani mekim laserom imali su statistički značajno manju srednju vrednost bola u odnosu na ispitanike tretirane Acicloviro (p<0,05). Na osnovu dobijenih rezultata može se zaključiti da se meki laser pokazao kao efikasna terapijska metoda u terapiji herpesa labialis, pa se preporučuje u tretmanima.

showed no side effects after radiation regardless of the stage of the disease.

The results of this study show good analgesic effect of soft laser which is in accordance with the results of other authors<sup>5,7-10</sup>. In fact, the subjects treated with the laser had significantly lower mean value of the pain as compared to subjects treated with aciclovir (p<0,05). When it comes to preventive effects of laser treatment, it can be used during the latent phase when there are no signs of infection, and the interval between the appearance of a new herpetic attack extends<sup>23,24</sup>. Therefore, laser light is used in prodromal stage in order to reduce the extension of lesions, as well as in the latent phase in order to increase the interval between two recurrences. Laser can be used in the phase of crust to accelerate the healing. The major advantage of laser treatment is that it does not have negative side effects and drug interactions; it is particularly applicable in the elderly and immunocompromised individuals.

### **Conclusion**

The subjects treated by soft laser had significantly lower mean value of the pain when compared to subjects treated with acyclovir (p<0,05). Based on the obtained results it can be concluded that the soft laser proved to be an effective therapy in the treatment of Herpes labialis, and therefore is recommended for its treatment.

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