

Research Article

Clinical and Biochemical Features of the Use of Black Cumin Oil in the Treatment of Chronic Generalized Periodontitis of Moderate Severity

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Abstract: This article provides data on the use of black cumin oil (Arkady) in the treatment of chronic generalized periodontitis of moderate severity. The data of clinical, radiological and biochemical research methods are presented. As a result of the study, it was found that clinical improvements (bleeding, bad breath, tooth mobility, periodontal pocket) occur already 2-3 days from the start of treatment, and in the comparison group, where traditional therapy was used, the improvements begin after 8-10 days from the moment of treatment. X-ray data (orthopantomography) allows us to conclude that there is an improvement in cortical plates, a decrease in the foci of osteoporosis by 2-3 months after the start of treatment. Moreover, in the comparison group there was an alternation of foci of osteosclerosis with osteoporosis. Biochemical parameters also indicate an improvement in antioxidant defense processes in patients of the main group than in the comparison group. The results are presented, the corresponding conclusions are made.

Keywords: patchwork operations; open curettage; black cumin oil (Arcaday); chronic generalized periodontitis.

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RELEVANCE:

Periodontal disease is a common inflammatory disease that, with progressive destruction of the supporting tissues of the tooth, forms periodontal pockets between the teeth and the surrounding gum tissue. As you know, periodontitis has a multifactorial etiology, with pathogenic bacteria in the gum region being the primary etiological agents. Among all bacteria, *Porphyromonas gingivalis*, *Aggregatibacter actinomycetemcomitans* are considered important periodontal pathogens that cause destructive periodontal disease (Akalm, F. A. *et al.*, 2007).

The goal of periodontal therapy is not only to prevent periodontitis, but also to restore the lost form, function, aesthetics. Standard periodontal therapy is aimed at reducing the total bacterial load and changing environmental conditions of microbial niches (Albander, J. M., & De Nardin, E. 1999; & Artese, L. *et al.*, 2010).

Although mechanical processing (Scaling Root Planing) reduces the level of subgingival bacteria,

it does not destroy all pathogens that are deep in the connective tissue that destroy bone (Blasco-Baque, V. *et al.*, 2017). To overcome these limitations of this conventional treatment, chemical agents such as antibiotics and antiseptics have been successfully used to treat moderate to severe chronic periodontitis. Systemic antibiotics require the use of a large dose to obtain an appropriate concentration in the area of inflammation, which potentially contributes to the development of bacterial resistance, drug interaction with gingival tissue compliance. Since the systemic administration of antibiotics has the listed disadvantages, then the local administration of antibiotics should solve such problems. Local delivery systems of therapeutic agents to the site of inflammation should not affect systemic effects.

In dentistry, namely in periodontics, for many years 10% doxycycline, 2% minocycline, 10% lincomycin, metronidazole and chlorhexidine bigluconate have been successfully used, but no local pharmaceuticals can do without side effects (Carranza, F.A.J., & Newman, M.G. 2012).

Research is being conducted on the use of natural products instead of chemical agents. Since the time of Avicenna (Abu Ali ibn Sino), medicinal plants have been used as a traditional remedy for the treatment of many diseases.

One of the natural products that has medicinal value is black cumin oil. Black cumin oil in oriental medicine is one of the most popular traditional medicine. The first mention of it dates back to the time of the Prophet Muhammad, who called this plant "salvation from all diseases except death."

However, in the literature there is no information on the use of black cumin oil in the complex treatment of periodontal diseases, therefore, we consider it relevant to conduct such a study.

Purpose of the study

Conduct a comparative randomized study on the use of black cumin oil in the treatment of chronic generalized periodontitis of moderate severity.

MATERIALS AND METHODS

To achieve this goal, 40 patients with moderate generalized chronic periodontitis were examined and treated. All patients were divided into 2 groups: group 1 - the main - 20 patients who underwent open curettage using patchwork operations, who were prescribed black cumin oil (Alkhadaya) in the amount of 1-2 capsules 2-3 times a day as therapeutic support, Group 2 - comparison group - 20 patients who underwent closed curettage technique (traditional treatment). All patients were examined clinically, before the operation, x-rays (orthopantomography) were obtained, and biochemical studies of saliva were also obtained. All patients gave written consent to participate in the experiment. Clinical, radiological and biochemical studies were performed before the study, the day after surgery, after 3 months.

Statistical processing of the results was carried out using the STATISTICA 12.0 program.

THE RESULTS OF THE STUDY

When examining patients with chronic generalized periodontitis of moderate severity on the 7th day after patchwork, open curettage and the use of black cumin oil (Alkhadaya) (main group) and closed curettage (control group), there was a positive trend, as indicated by a decrease in the RMA index up to $19.7 \pm 6.4\%$ (in the main group) and up to $11.3 \pm 4.2\%$ (control group), OHI-S 1.8 times (in the main group) and $32.4 \pm 3.6\%$ (control group). On day 30, the OHI-S index decreased by 31.6% (in the main group) and by 12.4% (control group) - $p \leq 0.05$, and after 6 months the decrease in this index in the main group was 4 times, in

the control - 1.5 times. The value of the PI index decreased on the 7th day to 3.4 ± 2.5 (in the main group) and to 4.3 ± 1.2 (in the control group), but a significant decrease in the index was determined 1 and 6 months after surgical treatment, respectively, up to 2.6 ± 0.7 and 3.0 ± 0.2 ($p \leq 0.05$).

A study of tooth mobility indicators on the Miller scale showed a positive trend.

It was found that on the 14th day, tooth mobility increased in both clinical groups (in the main group it was 0.95 ± 0.05 ($p \leq 0.05$) and in the control group it was 1.05 ± 0.07 ($p \leq 0.01$).

1 month after the operation, the value of this indicator returned to its original level and remained stable for 6 months. 1 year after surgery, it turned out that tooth mobility became less than in the initial measurements - in the main group this indicator was 0.60 ± 0.03 ($p \leq 0.001$), in the control group - 0.76 ± 0.03 ($p \leq 0.001$).

The average depth of periodontal pockets in all patients before surgery was 6.4 ± 0.3 mm. In the dynamics of observation, 87% of the main group and 65% of the control group showed a significant decrease.

The results of the study showed that as early as 1 month after surgical intervention and therapeutic use of black cumin oil (Alkhadaya) in all patients, a decrease in the depth of periodontal pockets was observed. However, this decrease was mainly due to gum retraction. A significant decrease in the depth of periodontal pockets was noted starting from 3 months after the operation, which was confirmed by clinical and radiological studies. The magnitude of the decrease in the indicator depended on the conditions of the operation (depending on the class of the bone defect) and the severity of the inflammatory-destructive process in the intervention site.

It should be noted that in 12 patients of the control group in the long-term follow-up, the effectiveness of the treatment was determined to be unsatisfactory. In the main group, 87% of patients showed a complete absence of osteoplastic material in the periodontal pocket 1 month after surgery, which was confirmed by x-ray examination. In 13% of patients of the main group, 6 months after surgery, repeated examination revealed signs of catarrh of the gum, recurrence of periodontal pocket in the operated area. All of these patients had poor oral hygiene, a large amount of soft plaque and tartar.

According to X-ray research methods in patients with chronic generalized periodontitis of moderate severity, 1 month after treatment, patients of the main group noted restoration of the cortical plate, a finely patchy bone pattern was observed, foci of osteoporosis remained in some areas. After 6 months

after treatment, a repeated x-ray examination showed a pronounced stabilization of the process in the main group, there were no bone pockets, an increase in the height of the alveolar ridge was observed. Persistent remission was observed in 86% of patients.

At the same time, in the control group 1 and 6 months after surgery, an alternation of foci of osteosclerosis with foci of osteoporosis was observed. The cortical plate was not observed in all areas of the alveolar ridge, the contour of the alveolar bone was fuzzy, intermittent. The smoothness of the peaks of the alveolar septa was observed. The depth of periodontal

pockets remained unchanged or decreased slightly. After 6 months, the x-ray picture did not improve. In addition, there was a progressive decrease in bone tissue and an increase in bone pockets in the area of individual teeth. Relapse was noted in 78% of patients; no signs of remission were observed.

The study of biochemical parameters characterizing the state of the oral cavity, allows you to set markers that indicate the early stages of periodontal damage, objectively evaluate the results of treatment of such patients.

Table 1. Some biochemical indicators of oral fluid in chronic generalized periodontitis of moderate severity before surgery.

Indicators	Main group	Comparison group
Ca, mmol / l	2,24 [1,85-2,87]	2,12 [1,68-2,64]
Mg, mmol / l	0,69 [0,66-0,78]	0,75 [0,62-0,79]
P, mmol / l	3,24 [2,84-4,74]	3,60 [3,14-3,94]
Total protein, g / l	1,84 [1,50-2,54]	2,66 [2,07-2,87]
SOD u / mg protein	32,1±1,1	30,9±1,0
Catalase mcat / L	0,39±0,01	0,37±0,01*
GPO u / mg protein	0,21±0,02*	0,20±0,02*

*-p≤0,01 SOD - superoxide dismutase

GPO - glutathione peroxidase

After the patchwork and open curettage in combination with black cumin oil (Arkhaday), a significant improvement in the biochemical parameters of saliva occurred. So, the content of SOD after complex treatment (surgical + therapeutic) in the main group improved to 57.8 ± 2.9 , the catalase content decreased to 0.09 ± 0.01 ($p \leq 0.01$), the GPO content decreased to $0, 13 \pm 0.05$ ($p \leq 0.01$), which corresponds to normal indicators.

CONCLUSIONS:

1. Clinical and radiological data indicate the positive use of black cumin oil (Arkady) as an adjuvant therapy for chronic generalized periodontitis of moderate severity
2. Due to the presence of black cumin (Arkhadai) thymoquinone in the oil, the number of free radicals decreases, the respiratory explosion becomes controlled, which suggests that black cumin oil has a beneficial effect on the antioxidant defense system of the body and restores immunity.
3. The use of black cumin oil (Arkady) in the complex treatment of periodontal diseases requires additional studies as a promising replacement for traditional pharmacological drugs with long-term side effects.

REFERENCES:

1. Akalun, F. A., Baltacıoğlu, E., Alver, A., & Karabulut, E. (2007). Lipid peroxidation levels and total oxidant status in serum, saliva and gingival crevicular fluid in patients with chronic periodontitis. *Journal of clinical periodontology*, 34(7), 558-565.
2. Albander, J. M., & De Nardin, E. (1999). Serum Ig G level to P. Gingivalis in healthy and early-onset periodontitis individuals. *J. Dent. Res*, 78, 250-255.
3. Artese, L., Piattelli, A., de Gouveia Cardoso, L. A., Ferrari, D. S., Onuma, T., Piccirilli, M., ... & Shibli, J. A. (2010). Immunoexpression of angiogenesis, nitric oxide synthase, and proliferation markers in gingival samples of patients with aggressive and chronic periodontitis. *Journal of periodontology*, 81(5), 718-726.
4. Blasco-Baque, V., Garidou, L., Pomié, C., Escoula, Q., Loubieres, P., Le Gall-David, S., ... & Azalbert, V. (2017). Periodontitis induced by Porphyromonas gingivalis drives periodontal microbiota dysbiosis and insulin resistance via an impaired adaptive immune response. *Gut*, 66(5), 872-885.
5. Carranza, F.A.J., & Newman, M.G. (2012). *Clinical periodontology*. - 9th ed. : W.B. Saunders Co.,-1033 p.