

Department of Dental and Maxillofacial Surgery, Medical University of Lublin

ANNA SZYSZKOWSKA, EMMA KIWORKOWA-RĄCZKOWSKA,  
T. KATARZYNA RÓŻYŁO

*The effectiveness of topical treatment  
of odontogenic inflammatory processes*

Most of the inflammations in the oral cavity appear as a result of odontogenic infections. The development of the fully symptomatic inflammation depends first of all on the patient's general health state, his immune system abilities as well as on the virulence of the germs and the coexisting systemic diseases. The choice of the treatment method is preceded by the anamnesis, clinical examination and the supplementary examinations (for example radiography). The effective treatment in most of the odontogenic inflammations relies on appliance of the dental procedures which eliminate the local cause of the inflammation which in most cases successfully impedes the development of the infection and an inflammatory process. Although the local treatment is approved as a method of choice in the treatment of the odontogenic inflammations, it is noticed that in everyday dental practice antibiotics and chemotherapeutics are used unnecessarily (2, 6, 8, 13, 15). The results of the surveys that were carried out in European countries show a prevalent usage of antibiotics on patients that come to dental surgeries because of the pain (symptoms) caused by odontogenic inflammatory process (2). In 74% of the cases dentists in their therapeutic procedures only use the pharmacological treatment, without surgical interventions and the choice of the antibiotic is made by dentists on the preference basis of a given medicament and not on the basis of bacteriological effectiveness test.

In national literature no studies were found on the usage of antibiotics in Polish dental practice, but there are some studies concerning applications of antibiotics taken as a whole. In Poland antibiotics make the dominant group of prescribed drugs comparing to other medicaments. It is generally considered that only 20–25% of antibiotics are prescribed in reasonable cases (5). The consequences of inappropriate antibiotic treatment are not only the absence of indications and the bacteriological inefficiency but also undesirable effects of the antibiotics causing the damage of the natural bacterial flora, allergic reactions, toxic effects as well as growing bacterial resistance (4, 14).

The aim of the study was evaluation of application of topical treatment only, on patients with the odontogenic inflammatory processes without the antibiotic or chemotherapeutic treatment.

#### MATERIAL AND METHODS

The topical treatment was applied in therapy of 143 patients aged 12–65 years (table 1) that were referred to the out-patient department of the Dental and Maxillo-Facial Surgery Clinic of the Medical University of Lublin because of the pain and other symptoms of the inflammatory process of a dental origin. Before the treatment the patients' medical history was recorded and general health condition as

well as the local symptoms were evaluated by means of clinical examination. The cause of the inflammation was determined next (x-ray studies).

Table 1. Number of treated patients including gender and age groups

Age Gender	12-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	Total
F	1	4	9	28	20	14	8	5	4	-	1	94
M	-	2	7	13	9	8	4	4	2	-	-	49
Total	1	6	16	41	29	22	12	9	6	-	1	143

All of the examined patients complained of pain of different nature (pain: constant, shooting, pulsating, radiating) in many cases of high intensity. There was observed a local swelling and reddening of the mucosa in the clinical intraoral examination. Moreover the patients with postextraction complications had alveoli totally or partially lacking a normal clot while being covered by necrotic masses. The clinical observation of patients with inflammatory complications after the extractions of teeth carried out by means of an incision of a mucoperiosteal flap showed not only the abnormal healing of the alveolus but also inflammation and damage of the perialveolar soft tissues of the alveolar process. All of the patients had clinical symptoms of the proceeding inflammatory process before beginning of the treatment.

Table 2. Causes of appearance of symptoms of inflammation in the treated patients

No.	Clinical diagnosis	Number of patients
1	Infection of alveolus after extraction of a third molar tooth	18
2	Infection of alveolus after extraction of a tooth	13
3	Pericoronitis of a molar tooth with the remaining tooth	12
4	Pericoronitis of a molar tooth (the tooth qualified for extraction)	16
5	Inflammatory complication after alveolar surgery	13
6	Subperiosteal abscess	18
7	Submucosal abscess	5
8	Gingival abscess	1
9	Infected cyst	1
10	Alveolar sinus tract (with a root relict)	2
11	Dry alveolitis after tooth extraction	18
12	Tooth with signs of acute suppurative periodontitis qualified for extraction (excluding molar teeth)	12
13	Deep periodontitis	4
14	Inflammation of a bone pocket	6
15	Decubitus ulceration	4
Total		143

In 143 cases of the odontogenic inflammation the regional lymph nodes were enlarged and tender in the clinical examination. Some patients also presented extraoral swelling of the soft tissues, pain and trismus as well as increased body temperature (tab 3). The topical treatment was applied in generally healthy patients, who were not treated pharmacologically because of other diseases. The patients who required surgical interventions had the causative teeth extracted, the abscesses were incised allowing the

drainage to be done, or any other topical procedure appropriate for a given clinical case was applied. Further topical treatment was continued by applying locally an infusion of the herbal mixture on the inflamed tissues. The herbal mixture consisted of 4 components: *Anthodium Chamomillae*, *Folium Plantaginis lanceolatae*, *Herba Euphrasiae* and *Cortex Quercus* in the form of single dosed sachets. The clinical examination concerning the effectiveness of herbal drug was carried in compliance with Good Clinical Praxis. The acceptance of the Ethical Commission of the Medical University of Lublin to the study was obtained as well as patients' informed consent.

Table 3. Clinical symptoms of odontogenic inflammatory processes found in patients before the onset of the local treatment

Number of patients	Spontaneous pain	Local oedema of intraoral mucosa	Local hyperaemia of intraoral mucosa	Extraoral oedema	Partial trismus	Increase of body temperature	Enlargement and tenderness of local lymph nodes
143	143	125	143	38	15	21	143

The herbal drug in form of brew infusion was made by infusing the sachet filled with the herbs in 100 ml of boiling water then it was left for about 30 minutes covered. This way the obtained brew was used to rinse the inflamed tissues by the single-use syringe and blunt-ended needle; the cataplasm (sachet) was also locally applied for about 20 minutes. This procedure was repeated 3 times a day after the meals. The instructed patients could follow the procedure at home on their own.

## RESULTS

During the treatment of the patients daily follow-up examinations allowed to observe a systematic reduction of the inflammatory symptoms. As early as after the first 24 hours the topical treatment applied caused not only distinct decrease of pain or its total abdication but also reduction of the swelling and congestion of the mucosa. Most of the patients also showed normalization of the body temperature. Total regression of the acute symptoms was observed after 1–7 days after the beginning of the treatment (tab. 4). Symptoms that persisted for the longest time were enlargement and tenderness of lymph nodes.

Table 4. Period of regression of inflammatory symptoms in patients in the course of local treatment

Duration of observation	Number of patients
after 1 day	11
after 2 days	18
after 3 days	42
after 4 days	45
after 5 days	18
after 6 days	5
after 7 days	4
Total	143

Among 143 patients topically treated using the herbal drug, 45 patients formed a group treated because of the post-extraction complications is the healing of alveoli. The treatment by herbal drug was carried on both – patients with inflammatory complications (27 patients) mainly caused by the difficult extractions executed by surgical procedures and on those patients whose symptoms were caused by the alveolar periostitis that occurred after simple extractions (18 patients).

The group of patients that was treated because of the postextraction inflammatory complications showed systematically progressing changes in the image of the alveolus. There was observed a distinct clearing of necrotic slot fragments from the wound and the slot was losing its dirty-gray color. Every day of the treatment brought an improvement in the local condition of the alveolus. A new, bright-red granulation tissue was forming. The alveolus was getting filled with a new slot in 3–7 days from the beginning of the treatment.

## DISCUSSION

The development of the inflammatory process depends on virulence of the bacterial strains provoking the infection, efficiency of the immune system and patients' general condition. When choosing the treatment method the dynamics of the inflammatory process as well as the intensity of the systemic signs should be taken into account. In most of the odontogenic inflammations the elimination of the infection source by means of the specific topical procedure (for example, trepanning of the pulp chamber, drainage, extraction of the causal tooth) diminishes the inflammation.

The odontogenic inflammations belong to the pathologies in treatment of which dentists commonly use the empiric antibiotic treatment. The expected possibility of the reduction of the antibiotic usage in the odontogenic inflammations treatment was the reason why the study on herbal drugs was undertaken. The irrigation technique used seems to be not only efficient but also seems to dominate over the traditional method of rinsing the oral cavity by patients. The flush of the drug applied by the syringe and the needle reaches all the tissue recesses in the phase of the inflammation. This is the reason why apart from its bacteriological effectiveness it also in a mechanical way tearing the bacterial colonies off the surface thus decreasing their amount. The effectiveness of the traditional oral cavity rinsing by the patients with the bactericide solution in prevention of bacteremia following the dental procedures is impaired according to some authors because the solution does not penetrate the periodontal pockets. This means that it practically cannot prevent the germs from entering the blood stream (3, 10).

Following the extraction procedure there are often observed inflammatory complications and poor healing of the alveoli. The main cause of a poor healing process is an infection of the postextraction wound. Germs easily infect open wounds in the oral cavity and the risk of the infection is directly proportional to the amount of present germs, their virulence as well as to the personal predisposition for the complications in healing processes (dry alveolus). Particularly in poor alveoli healing (deep wounds) the used technique let the drug reach inside of the alveolus and cleanse it by rinsing out the relics of food, necrotic masses and the bacterial colonies.

In patients treatment apart from the local irrigation the herbal cataplasms were applied. The cataplasm assures a longer contact of the drug with the tissues altered by the inflammatory process, this way increasing the drug effectiveness. The direct impact of the drug hampers the germs growth while the transport of a generally applied drug to a target location is difficult and often even impossible because of the leucocyte rim forming around the inflammation. The effectiveness of the herbal drug applied in the treatment of the odontogenic inflammations depends on the biological factors of all of the herbs used. The herbs that composed the drug that was used in the topical treatment contained bioactive irydid glycosides, flavonoids, etheric oils and tannins. Owing to their pharmacological

activity the herbal drug used in treatment showed an effective antibacterial, anti-inflammatory, antimycotic, analgesic effects as well as promoted the healing process.

In dental practice as well as in all other medical fields effective limiting of the antibiotic usage should be undertaken. The decrease in chemotherapeutics usage will be possible only if the rules of the antibiotics usage will be complied in everyday medical and dental practice. In many cases of dental treatment there can be used a herbal drug that does not cause any side-effects related to a antibiotic and chemotherapeutic usage.

## CONCLUSION

1. The effectiveness of the topical treatment of the odontogenic inflammations, without a necessity in antibiotic or chemotherapeutic application, was proved.

2. The herbal mixture used in topical treatment of oral inflammations showed antibacterial, anti-inflammatory, antimycotic, analgesic effects and it promoted the healing process.

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## SUMMARY

The aim of the study evaluation of application of topical treatment only on patients with the odontogenic inflammatory processes without the antibiotic or chemotherapeutic treatment. The topical treatment was applied in therapy of 143 patients aged 12–65 years, and all of them had clinical symptoms of inflammatory process before beginning of the treatment. The herbal mixture consisted of 4 components: *Anthodium Chamomillae*, *Folium Plantaginis lanceolatae*, *Herba Euphrasiae* and *Cortex Quercus* in the form of single dosed sachets. The effectiveness of the topical treatment of the odontogenic inflammations, without a necessity in antibiotic or chemotherapeutic application, was proved. The herbal mixture used in topical treatment of oral inflammations showed antibacterial, anti-inflammatory, antimycotic, analgesic effects and it also promoted the healing process.

### Skuteczność leczenia miejscowego zębopochodnych procesów zapalnych

W pracy wykazano skuteczność leczenia miejscowego zębopochodnych procesów zapalnych u pacjentów nieobciążonych chorobami ogólnoustrojowymi. Zastosowano wyłącznie terapię miejscową u 143 pacjentów. W pierwszym etapie leczenia został wykonany odpowiedni dla danego przypadku zabieg specjalistyczny (m.in. otwarcie komory zęba, nacięcie ropnia, drenaż, ekstrakcja zęba), a w dalszym postępowaniu zastosowano na tkanki zmienione zapalnie w jamie ustnej napar mieszanki ziołowej w formie irygacji oraz okład ziołowy (kataplazm), trzy razy dziennie do czasu ustąpienia objawów zapalnych ogólnych i miejscowych.