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Clinical and Laboratory Manifestations of Purulent-Septic Complications of Odontogenic Inflammatory Diseases

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ABSTRACT

Diagnosis and treatment of purulent-inflammatory diseases of the maxillofacial region are currently one of the most pressing problems. This is evidenced by numerous scientific publications, conferences, symposia, congresses devoted to these issues. In the last decade, there has been a significant increase in the number of purulent-inflammatory diseases of the maxillofacial region. According to a number of authors, inflammatory diseases of the face and neck account for 10% to 30% of surgical patients who go to dental clinics, and about 50-60% of patients hospitalized in specialized dental clinics. Among them, the greatest danger to the health and life of patients is phlegmons of the maxillofacial region. In recent years, the clinical course of odontogenic purulent-inflammatory diseases has changed significantly. On the one hand, there was a significant shift in the structure of morbidity towards the prevalence of cellulitis. Progressive, including fulminant forms of purulent-inflammatory processes, spreading to several cell spaces, began to occur more frequently. The number of severe complications of purulent-inflammatory diseases of the face and neck, such as acute sepsis, toxic-infectious shock, septic meningoencephalitis, brain abscess, cerebral sinus thrombosis, arrosive bleeding, mediastinitis, septic endo- and myocarditis, which pose a threat to the life of patients, has increased. This article provides information on the clinical and laboratory manifestations of purulent-septic complications of odontogenic inflammatory diseases.

Keywords: odontogenic inflammatory diseases, sepsis, multiple organ dysfunction

INTRODUCTION

Odontogenic inflammatory diseases include pathological processes of an infectious and inflammatory nature that affect the jaw bones and adjacent soft tissues (cellular spaces, regional lymph nodes, etc.), and the main cause of their occurrence is dental diseases [1].

The analysis of literature sources, including resolutions of international conferences and symposia on the problem of odontogenic inflammatory diseases, showed that many aspects in the randomization of the entire group of these pathological processes are still far from being solved [2, 3, 4].

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Until now, the approach to determining the types of complications of odontogenic inflammatory diseases is reduced to the separation of anatomical structures and areas of infection [5].

Nevertheless, complications of odontogenic inflammatory diseases with damage to both distant organs and anatomical formations are distinguished as a separate group [6]. This is the basis for local generalization of infection (mediastinitis, facial vein thrombophlebitis, dural sinus thrombophlebitis, etc.) and for the general generalization of infection, i.e., the development of sepsis [7].

The collection of literature data on the diagnosis and treatment of purulent complications of odontogenic inflammatory diseases has revealed a clear trend towards an increase in the number of publications over the past decades devoted to this problem, which indicates the relevance of this direction in maxillofacial surgery [8].

The prevalence of cellulitis of the maxillofacial region of odontogenic origin increases from year to year. With the spread of the process to the neck and mediastinum, the mortality rate reaches 60%, and with generalization of the infection leading to septic shock, it increases to 90% [9].

In recent years, there has also been a steady increase in the number of progressive cellulitis, often complicated by such formidable conditions as contact mediastinitis, cavernous dura sinus thrombosis, brain abscess, sepsis, as well as atypical and asymptomatic cellulitis [10].

The clinical picture of cellulitis of the maxillofacial region is quite often manifested by a disorder of numerous links in the homeostasis system, some of which are: immunity, detoxification, hemostasis, rheology, etc. [11].

The development of endogenous intoxication syndrome in purulent-inflammatory diseases is characterized by gross disorders of regulation and metabolism, which lead to a violation of homeostasis, a "breakdown" of protective functions and systems, and the formation of vicious autocatalytic circles, which create conditions for the preservation and progression of endotoxemia [12].

The nature of the formation and severity of endogenous intoxication, on the one hand, depends on the intensity of free-radical oxidation reactions, and on the other hand, the level of endotoxemia determines the degree of imbalance of the pro-antioxidant system. Treatment of patients with inflammatory processes of the maxillofacial region and neck is based on comprehensive surgical interventions and conservative measures [13].

A significant proportion of patients with acute purulent-inflammatory diseases of the face and neck most often have a pronounced secondary immunodeficiency [14].

MATERIAL AND METHODS

When patients went to the clinic in order to identify purulent-septic complications, we assessed the presence and number of signs of the systemic inflammatory response syndrome.

Among 44 patients, we registered 133 clinical and laboratory signs of systemic inflammatory response syndrome. On average, there were 3 clinical and laboratory signs per 1 patient.

At the same time, out of 44 patients, in 31.8% of cases, the patients had 2 clinical and laboratory signs of the systemic inflammatory response syndrome, in 34.1% of cases – 3 signs, and in another 34.1% of cases – 4 clinical and laboratory signs.

The most common combination of clinical and laboratory signs of systemic inflammatory response syndrome was the presence of tachycardia, hyperthermia, and leukocytosis.

Damage to distant organs and systems in the form of organ dysfunction or insufficiency was detected in 21 (47.7%) patients. In the remaining patients (52.3%), the presence of signs of sepsis was without damage to distant organs and systems.

Accordingly, for the randomization of patients with purulent-septic complications of odontogenic inflammatory diseases, we divided all of them into 2 groups: the first group consisted of 23 patients (52.3%) who were diagnosed with sepsis syndrome without signs of impairment of distant organs, and 21 patients (47.7%) who were diagnosed with severe sepsis with signs of organ dysfunction or insufficiency.

Among the patients of the first group, cases prevailed (30.4%) with three clinical and laboratory signs of the systemic inflammatory response syndrome, while among the patients of the second group (61.9%) – with four signs of the disease.

Patients with no clinical and laboratory sign of systemic inflammatory response syndrome or the presence of only one sign were not included in our studies.

In general, 133 signs of the systemic inflammatory response syndrome were revealed in 44 patients, and on average 3 signs were observed per 1 patient. In patients of the first group, 1 patient had 2.5 signs of systemic inflammatory response syndrome, and 1 patient of the second group had 3.6 signs.

RESULTS AND DISCUSSION

Most patients (54.5%) presented to the clinic within the first week after the onset of the disease. In 45.5% of cases, patients were admitted to our clinic after ineffective treatment in other clinics at the place of residence, where, as a rule, they had already undergone an autopsy of cellulitis. However, due to the lack of effectiveness of treatment and deterioration of the condition, as well as the development of generalization of the infection, the patients were hospitalized to us.

6 (13.6%) patients were hospitalized within 3 days from the onset of the disease, 8 (18.2%) patients were hospitalized from 4 to 5 days, 10 (22.7%) patients were hospitalized from 6 to 7 days, 11 (25%) patients were hospitalized from 8 to 9 days, 6 (13.6%) patients were hospitalized from 10 to 14 days, and 3 (6.8%) patients were hospitalized within 2 weeks from the onset of the disease. Among the patients of the first group, in 73.9% of cases, the patients were hospitalized within 7 days from the onset of the disease, while among the patients of the second group, the main part (66.7%) were patients with late hospitalization – from 8 days and longer.

The main odontogenic inflammatory diseases complicated by sepsis were exacerbation of chronic periodontitis (79.5%) and acute pericoronitis (20.5%). Moreover, such a variance of values was noted both among the patients of the first group (73.9% and 26.1%, respectively) and among the patients of the second group (85.7% and 14.3%, respectively).

In most cases, the development of cellulitis was preceded by the extraction of the affected tooth. At the same time, due to the acceleration of the inflammatory process, patients took analgesics, rinsed the oral cavity, various thermal procedures and even made incisions in the gum area and the bed of the extracted tooth. At the same time, as our analytical data of patients show, this approach was ineffective and led to the rapid development of submandibular phlegmon.

Diagnosis of purulent-necrotic complication of odontogenic inflammatory diseases was carried out during the initial examination. In 38.6% of cases, cellulitis initially formed in the submandibular region. It can be noted that this area was the most vulnerable to the development of purulent-necrotic complications of odontogenic inflammatory diseases, since among the patients of the first group it was noted in 9 (39.1%) patients, and in the patients of the second group it developed in 8 (38.1%) patients.

Cellulitis of the floor of the oral cavity was present in 6 (13.6%) patients (3 patients in the first and second sub-

groups). The cellular fascial space of the chin region was affected by a purulent necrotic process in 5 (11.4%) patients. In 3 (13.0%) patients, it was in the first group, and in 2 (9.5%) patients, it was in the second group.

Cellulitis of the buccal, parotid-masticatory and pterygoid-mandibular regions was observed in an even degree in both patients of the first and second groups (27.3%). Also, the same proportion was found to be affected by the purulent-necrotic process of the circumpharyngeal and masticatory spaces (9%).

Such a distribution of patients, of course, represented the results of the primary, preoperative, diagnosis. However, the final diagnosis of the prevalence of the purulent-necrotic process could be made only after surgery. This made it possible not only to carry out surgical treatment of the purulent focus, but also to identify the boundaries of the spread of the purulent-necrotic process and the amount of damage to the cellular fascial spaces of the maxillofacial and cervical regions, as well as the mediastinum.

The spread of the purulent-necrotic process, as a complication of odontogenic inflammatory diseases, was mainly (68.2%) within 4 cellular fascial spaces of the maxillofacial region and neck.

In 34.1% of cases (15 patients), the process was spread within 1 cellular fascial space. All of them were patients of the first group. Two cellular fascial spaces were affected in 6 (13.6%) patients, with 5 (83.3%) patients in the first group and 1 patient (16.7%) in the second group.

The spread of the purulent-necrotic process along the three cellular fascial spaces was revealed in 3 (6.8%) patients, and in the majority (66.7%) of cases it was noted among the patients of the first group.

Four cellular fascial spaces were affected in 6 (13.6%) patients, which were mainly noted among the patients of the second group (83.3%), while among the patients of the first group there were only 1 such cases (16.7%). The same number of patients had lesions of six cellular fascial spaces, but all of them were represented by patients of the second group. In other cases, when seven, eight or more cellular fascial spaces were affected, all of them were noted among patients of the second group.

In general, from 1 to 3 cellular fascial spaces were affected by the purulent-necrotic process in 95.7% of cases among the patients of the first group, while among 90.5% of the patients of the second group, the purulent-necrotic process spread to 4 or more cellular fascial spaces of the maxillofacial region and neck.

Analysis of the degree of involvement in the inflammatory process of the cellular spaces of the maxillofacial region, neck and mediastinum showed that in 54.5% of cases (24 patients) the lesion was deep. At the same time, in 85.7% of cases (18 patients) such damage was due to patients of the second group. In 17 patients of the first group, in 73.9% of cases, the purulent-necrotic process was superficial.

When assessing the intensity of caries and its components in patients with purulent-septic complications of odontogenic inflammatory diseases, we found that the index of carious teeth, filled teeth and extracted teeth averaged 13.47 ± 4.21 units, while among the patients of the first group it was 11.08 ± 3.63 units, and among the patients of the second group - 15.87 ± 4.81 units.

A detailed analysis of this index showed that the average number of caries foci was 3.38 ± 0.25 units (3.24 ± 0.32 units among patients of the first group and 4.52 ± 0.92 units among patients of the second group).

The average number of teeth with fillings was equal to 4.68 ± 0.58 units (4.23 ± 0.64 units among the patients of the first group and 5.13 ± 0.53 units among the patients of the second group). The mean number of extracted teeth was equal to 4.91 ± 0.71 units (3.61 ± 0.21 units among the patients of the first group and 6.22 ± 1.1 units among the patients of the second group).

Analysis of the obtained laboratory blood parameters in patients with purulent-septic complications of odontogenic inflammatory diseases revealed a significant difference ($p < 0.05$) between patients of the first and second groups in such parameters as ALT, AST, prothrombin index, heparin tolerance, D-dimer level and leukocyte index of intoxication. All of them can indirectly indicate the intensity of the purulent-inflammatory process. An increase in transferase enzymes in the blood was associated with the presence of lesions of distant organs, in particular the liver, in patients of the second group.

In the dynamics of the treatment, we paid attention to the degree of manifestation and disappearance of the signs of the systemic inflammatory response syndrome of the body, as well as the frequency of lethal outcomes. Thus, if on the 1st day of treatment in 68.2% of cases (30 patients) 3-4 signs of the systemic inflammatory response syndrome of the body were diagnosed, then on the 3rd day of the treatment there was a decrease in the number of patients with 3 signs of generalization of infection to 27.3% of cases. At the same time, the number of patients with 4 signs of generalization of infection was still at a stable level of 34.1% of patients.

On the 5th day of treatment, 4 (9.1%) patients died due to the progression of sepsis. The number of patients with 4 signs of systemic inflammatory reaction syndrome decreased to 20.5%, and 3 signs to 22.7%. Against this background, the number of patients with 2 signs of generalization of infection increased from 34.1% to 36.4% and with 1 sign - from 4.5% to 11.4%.

On the 7th day of treatment, another 3 (6.8%) patients died due to progression of damage to distant organs. The number of patients with 4 signs of systemic inflammatory response syndrome decreased to 6.8% (3 patients), with 3 signs - to 18.2% (8 patients), with 2 signs - to 27.3% (12 patients). Against this background, in 14 (31.8%) patients, relief of purulent-septic complications was achieved.

On the 10th day of the traditional treatment, another 1 (2.3%) patient died. Of the remaining patients in the study, patients without septic disease prevailed (47.7%). In other cases, the patients still had 2 (27.3%) and 3 (6.8%) clinical and laboratory signs of the systemic inflammatory response syndrome.

In general, for the entire period of treatment of patients with purulent-septic complications of odontogenic inflammatory diseases, the mortality rate was 18.2% (8 patients), the main causes of which were the progression of lesions of distant organs against the background of low efficiency of local and general therapy. Proof of this judgment can be found in the high level of lethal outcomes (up to 75%) among patients of the second group. Lethality among patients of the first group was noted by us in 2 cases.

CONCLUSION

Analysis of purulent-septic complications of odontogenic inflammatory diseases in 68.2% of cases are manifested by 3-4 signs of the syndrome of a systemic inflammatory response of the body. At the same time, for patients with purulent-septic complications of odontogenic inflammatory diseases with damage to distant organs, such a nature of clinical and laboratory manifestations is noted in 100% of cases and is characterized by high mortality (6 out of 8 patients).

Conflict of interest – none

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Ethical component – was observed

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ODONTOGEN YALLIG'LANISH KASALLIKLAR- INING YIRINGLI-SEPTIK ASORATLARI KLINIK VA LABORATOR KO'RINISHLARI

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Maxillofacial mintaqaning yiringli yallig'lanish kasalliklarini tashxislash va davolash hozirgi kunda eng muhim muammolardan biridir. Buni ko'plab ilmiy nashrlar, konferentsiyalar, simpoziumlar, ushbu masalalarga bag'ishlangan kongresslar ko'rsatib turibdi. So'nggi o'n yil ichida maxillofacial mintaqaning yiringli yallig'lanish kasalliklari soni sezilarli darajada oshdi. Bir qator mualliflarning fikriga ko'ra, tish-tirnog'i dispanserlariga boradigan xirurgik bemorlarning 10% dan 30% gacha yuz va bo'yinning yallig'lanish kasalliklari, maxsus tish klinikalarida kasalxonaga yotqizilgan bemorlarning 50-60% ga yaqinini tashkil etadi. Ular orasida bemorlarning sog'lig'i va hayoti uchun eng katta xavf - bu maxillofacial mintaqaning flegmonlari. So'nggi yillarda odontogen yiringli yallig'lanish kasalliklarining klinik kursi sezilarli darajada o'zgaradi. Bir tomondan, morbidlik strukturasi selulit tarqalishiga nisbatan sezilarli o'zgarish bo'ldi. Progressiv, shu jumladan yiringli yallig'lanish jarayonlarining fulminant shakllari, bir nechta hujayra bo'shlig'iga tarqalib, tez-tez sodir bo'ldi. Yuz va bo'yinning o'tkir sepsis, toksik-infektsion shok, septik meningosefalit, miya xo'ppozi, bosh miya sinus trombozi, arroviv qon ketishi, mediastinit, septik endo- va mitokardit kabi og'ir asoratlari soni ko'paydi, bu bemorlarning hayotiga xavf tug'diradi. Ushbu maqolada odontogen yallig'lanish kasalliklarining yiringli-septik asoratlarining klinik va laboratoriya ko'rinishlari haqida ma'lumot berilgan.

Tayanch iboralar: odontogen yallig'lanish kasalliklari, sepsis, ko'p a'zolar disfunktsiyasi

КЛИНИКО-ЛАБОРАТОРНЫЕ ПРОЯВЛЕНИЯ ГНОЙНО-СЕПТИЧЕСКИХ ОСЛОЖНЕНИЙ ОДОНТОГЕННЫХ ВОСПАЛИТЕЛЬНЫХ ЗАБОЛЕВАНИЙ

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Диагностика и лечение гнойно-воспалительных заболеваний челюстно-лицевой области в настоящее время являются одной из самых актуальных проблем. Об этом свидетельствуют многочисленные научные публикации, конференции, симпозиумы, конгрессы, посвященные этим вопросам. В последнее десятилетие наблюдается значительный рост числа гнойно-воспалительных заболеваний челюстно-лицевой области. По данным ряда авторов, воспалительные заболевания лица и шеи составляют от 10% до 30% хирургических больных, которые обращаются в стоматологические клиники, и около 50-60% пациентов, госпитализированных в специализированные стоматологические клиники. Среди них наибольшую опасность для здоровья и жизни пациентов представляют флегмоны челюстно-лицевой области. С одной стороны, произошел существенный сдвиг в структуре заболеваемости в сторону преобладания флегмоны. Прогрессирующие, в том числе фульминантные формы гнойно-воспалительных процессов, распространяющиеся на несколько клеточных пространств, стали протекать чаще. Возросло число тяжелых осложнений гнойно-воспалительных заболеваний лица и шеи, таких как острый сепсис, токсико-инфекционный шок, септический менингоэнцефалит, абсцесс головного мозга, тромбоз мозгового синуса, аррозивное кровотечение, медиастинит, септический эндо- и миокардит, которые представляют угрозу для жизни больных. В данной статье приводятся сведения относительно клинико-лабораторным проявлениям гнойно-септических осложнений одонтогенных воспалительных заболеваний.

Ключевые слова: одонтогенные воспалительные заболевания, сепсис, полиорганная дисфункция