

Odontogenic abscesses in the maxillo-facial area in children from less than 3 years of age: a clinical study on 20 cases in Bulgaria

P. F. Pechalova*, A. D. Zheleva, N. V. Pavlov

Department of Maxillofacial Surgery, Faculty of Dental Medicine, Medical University
 66, Pestersko shosse Street, Plovdiv, Bulgaria

*Corresponding author: 00359888254906. E-mail: pechalova@abv.bg
 Manuscript received August 31, 2011; revised December 05, 2011

Introduction: Inflammatory processes of odontogenic origin in the maxillo-facial area are rare in children less than 3 years of age. **Aim:** The aim of this study was to present the structure and specific characteristics of odontogenic inflammatory processes in the maxillofacial area in children less than 3 years of age. **Material and methods:** Data was collected from patient's medical files from the Clinic of Maxillofacial Surgery at "St. George" University Hospital in Plovdiv, Bulgaria between January 1996 and April 2008. Data processing was performed with software SPSS 11.0. **Results:** Inflammatory processes were mainly in the maxilla rather than the mandible (1/0.05). Surgical treatment was etiological and included intraoral incision (all patients), extraction of the deciduous tooth that caused the inflammation (in 95% of the patients), or conservative dental medication (in 5% of the patients). Operative treatment was under general anesthesia (in 80% of the patients), local anesthesia with premedication (in 5% of the patients), or local anesthesia (in 15% of the patients). On average 2.3 teeth per patient were extracted. The microorganisms most frequently found were *E. coli*, *Str. α-haemol.*, *Enterococcus*. Cephalosporins were most frequently applied. The patients spent in a hospital an average of 3.3 days. **Conclusion:** Odontogenic abscesses and phlegmons are found in early childhood (less than 3 years of age), even though the denture is still forming; and there is a tendency of a rise in their frequency.

Key words: facial abscess, odontogenic origin, early childhood.

Одонтогенные абсцессы в челюстно-лицевой области у детей до 3-х летнего возраста: клиническое изучение воспалительных процессов одонтогенного происхождения 20 случаев в Болгарии

Введение: Воспалительные процессы одонтогенного происхождения челюстно-лицевой области редко встречаются у детей 3 лет. **Цель:** Описание структуры и характерных клинических признаков одонтогенных воспалительных процессов челюстно-лицевой области у детей младше 3-х лет. **Материал и методы:** Были собраны данные медицинских карт пациентов Клиники Челюстно-лицевой хирургии "St. George" в Университетской больнице г. Пловдив, Болгария, в период с января 1996 года по апрель 2008 года. Обработка данных проводилась с помощью программы SPSS 11.0. **Результаты:** Воспалительные процессы в основном были выявлены в верхней челюсти, а не в нижней (1/0.05). Хирургическое лечение являлось этиологическим методом и включало внутриротовой разрез (все пациенты), экстракцию больных зубов, которые вызвали воспаление (у 95% пациентов) или консервативное медикаментозное лечение (у 5% пациентов). Оперативное лечение было проведено под общей анестезией (у 80% пациентов), местной анестезией с премедикацией (у 5% больных), или местной анестезией (у 15% пациентов). В среднем были удалены 2, 3 зуба на одного пациента. Наиболее часто встречающиеся микроорганизмы были *E. coli*, *Str. α-haemol.*, *Enterococcus*. Цефалоспорины – наиболее часто применяемые антибиотики. Число дней, проведенных в больнице, составляло в среднем 3,3 дня. **Вывод:** Одонтогенные абсцессы и флегмоны выявляются в раннем детском возрасте (у детей менее 3 лет), несмотря на развитие зубной ткани. И это является тенденцией роста их частоты.

Ключевые слова: лицевой абсцесс, одонтогенное происхождение, раннее детство.

Introduction

The increasing of incidence of head and neck abscesses is reported in the literature [1, 2]. Facial swelling – an obligatory symptom of maxillo-facial abscesses, is a common clinical problem in the pediatric population and may have a wide variety of causes [3]. This fact either inflammatory processes of odontogenic origin in the maxillo-facial area are rare in children up to the age of 3 as compared to the number of citizens, may cause misdiagnosis. These bring problems in treatment, due to the difficult identification of etiology [4, 6] and the specific characteristics of the organism of the child; and this can bring about life-threatening complications.

Aim

The current study aims to present the structure and specific characteristics of odontogenic inflammatory processes

in the maxillo-facial area in children less than 3 years of age – namely etiology, localization, findings of the microbiological tests, treatment scheme, and length of stay in hospital and outcome of the condition.

Material and methods

The study protocol was approved by the Committee of Ethics in Research from the Faculty of Dental Medicine, Medicine University, Plovdiv, Bulgaria.

Twenty children less than 3 years of age were treated in the Clinic of Maxillo-facial Surgery at "St. George" University Hospital in Plovdiv, Bulgaria between January 1996 and April 2008. They all had inflammatory processes of odontogenic origin in the maxillo-facial area, with no accompanying diseases. Boys/girls ratio is 1/0.8. Patients included in the study were on average 2 years 3 months old (from 1 year to 2 years 11 months). One child had been brought from another hospital

after unsuccessful treatment for the same disease, while the others were taken as emergency cases. As there is no statistically significant difference in age and sex ($p > 0.05$), further in our study patients will be discussed as a whole. Data was processed with SPSS 11.0.

Treatment key points were:

- locating the process and the affected anatomical area;
- finding the etiology;
- paraclinical tests/blood; imaging diagnostics;
- medication;
- choice of anesthetic to be applied in surgery;
- surgical treatment – taking away the inflammatory infiltrate by means of incision and draining; etiologial treatment;
- microbiological tests to determine the cause;
- constant control of the condition till all is normal.

Results

Inflammatory processes of odontogenic origin in the maxillo-facial area in children less than 3 years of age represented 0.52% of all patients with inflammations for the period of the study. No patients were under 1 year of age, and 65% of the totals were between 2 and 3 years old. Fig. 1 shows the tendency of a rising number of inflammatory processes of odontogenic origin for the time of the study. The maxilla area was affected more frequent than mandible - maxilla: mandible ratio was 1: 0.05, which is statistically significant. The most frequently affected zones in the maxilla were fosse canine and the infraorbital area (73.7%). The origin of the inflammations

was complications of tooth caries. An average of 2.45 teeth was found to be the cause, 73.5% of them were maxillary incisors. Ratio of operations under general anesthesia to those with local anesthesia and premedication was 1: 0.06. The ratio of operations under general anesthesia to those with local was 1: 0.2. All patients were treated with intraoral incision, and 95% of them underwent tooth extraction (tab. 1). Forty six deciduous teeth were extracted – 78.3% of them were maxillary incisors, 13% - maxillary molars, 6.5% - maxillary canines, and 2.2% mandibulary molars.

In this study 55% of the cases had positive microbiological tests. *E. coli*, *Str. α-haemol.*, *Enterococcus*, was most frequently isolated. The other 45% of the cases had negative microbiological tests.

Ninety five per cent of patients in this study were treated with antibiotics – ratio of peroral antibiotics to parenteral was 1: 0.9. Five per cent of the children were were treated with more than one antibiotic at the same time. Cephalosporins were most frequently applied (fig. 2). The patients spent in hospital an average of 3.3 days.

All patients in the group were discharged in better condition, later checkups found them clinically healthy. None of them was redirected to other hospitals or other clinics in our hospital.

Discussion

Early childhood is the period when the temporary denture is formed [7]. The current study found out that inflammatory process of odontogenic origin in the maxillo-facial area

Table 1

Odontogenic inflammatory processes in the maxillofacial area in children less than 3 years of age

Sex		Location of inflammation		Anaesthetic used			Caused by teeth in						Teeth causing inflammation extracted		Teeth causing inflammation treated conservatively	
							Upper jaw			Lower jaw						
boys	girls	in upper jaw area	in lower jaw area	narcosis	local anaesthetic with premedication	local anaesthetic with premedication	incisors	canines	molars	incisors	canines	molars	in upper jaw	in lower jaw	in upper jaw	in lower jaw
11	9	19	1	16	1	3	36	4	8	0	0	1	45	1	3	0

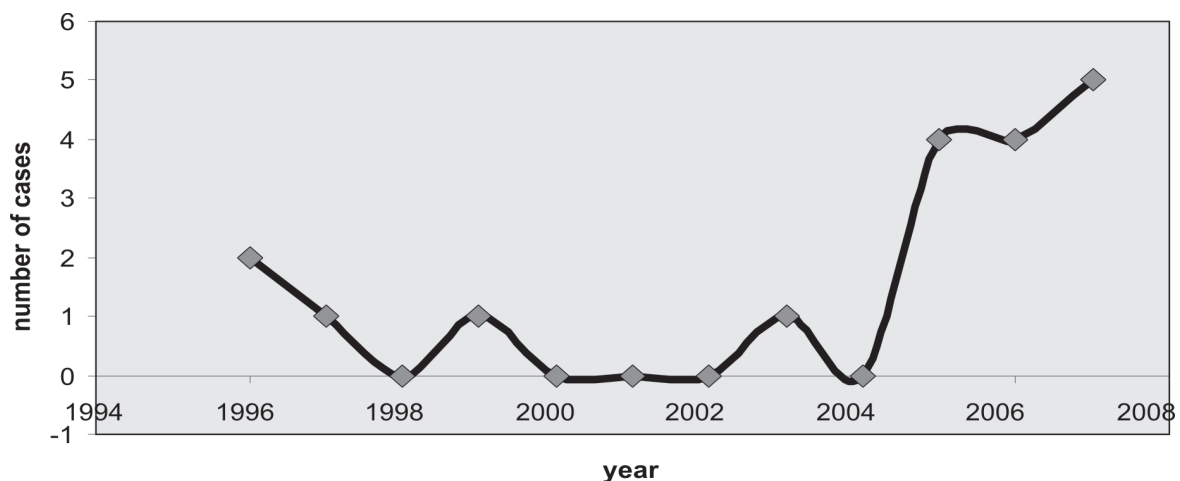


Fig. 1. Dynamics of odontogenic inflammatory processes in the maxillo-facial area in children less than 3 years of age.

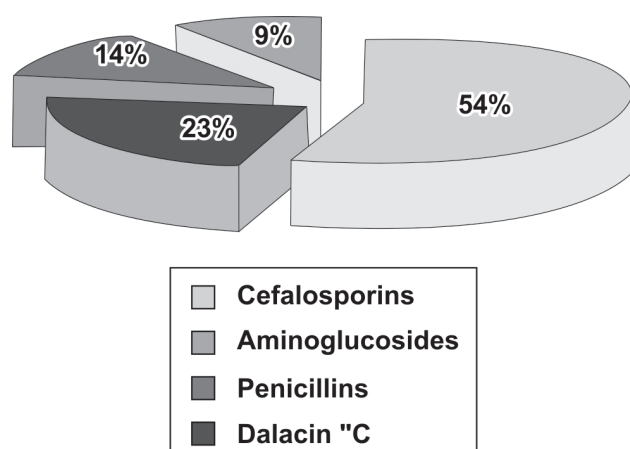


Fig. 2. Most commonly used antibiotics in the treatment of children less than 3 years of age with inflammatory processes in the maxillofacial area.



Fig. 3. Intraoral status of the patient with left intraorbital abscesses.

in children less than 3 years of age represented 0.52% of the total number of cases. There are other publications estimating this number to be 18% [8]. Still others claim that 32% of all analyzed cases are with children and adolescents aged 0 – 19 [9]. A kind of peak in the development of maxillo-facial inflammations as compared to the total number of people is found in patients up to the age of 12 [10]. The high frequency of the condition is related to the frequency of caries of the temporal teeth [11].

The standard procedure for taking anamnesis of patients with inflammatory processes in the maxillo-facial area cannot be applied to children under 3 years, as they are uneasy, nervous and traumatized by the unpleasant experiences accompanying the condition. Worried by the disease of their children, parents often do not give the necessary information at the examination. That is why diagnosing is mainly on the basis of clinical tests. The doctor looks for painful infiltrate with craniofacial soft tissue fluctuation. Examinations of the mouth focuses on teeth with caries, or with changed colour of the corona, or fractured by some trauma, teeth whose pulp vitality is questionable. It is especially important to evaluate the condition of the surrounding soft tissue, which, in case of inflammation, is seen to be swollen, hyperemic (fig. 1) and painful; their palpation brings very unpleasant feelings, children reacting strongly with uneasy movements and cries.

This study found a much higher frequency of cases in the upper jaw area, while other publications have reported more cases in a lower jaw [8, 10]. Voorsmith report that in most cases of abscesses caused by deciduous teeth the mandibular deciduous molars were involved [12].

The patients from our group spent an average of 3.3 days in hospital. Other sources vary significantly as to that – 3.7 days [14]; 4 days [14]; 8.6 days [15]; 9.2 days [16].

In 55% of cases of our series we received positive microbiological tests. The most common isolated microorganisms were *E. coli*, *Streptococcus α-haemolyticus*, *Enterococcus*. Rustom et al. reports that *Staphylococcus aureus* was the commonest organism cultured in their series of 64 children

with neck abscesses and mean age 3.68 years [13]. Rush et al. isolated most common aerobes *Streptococcus viridans*, *Neisseria*, *Eikenella* and anaerobes *Prevotella*, *Peptostreptococcus* in their series of 60 children with facial cellulitis of odontogenic origin [17]. Other researchers claim that not all odontogenic abscesses need microbiological tests, but whenever antibiotics are administered parenterally there should be an antibiogram to verify the microorganisms [18].

Our findings were that in treating inflammations 95% of the patients were given antibiotics – mainly cephalosporins (54%). In the series of Rustom et al. Flucloxacillin was the most common antibiotic used (57.8%) [13]. Rush et al. recommended the usage of Unasyn (ampicillin plus a beta-lactamase inhibitor) or Clindamycin because the polymicrobial aerobic/ anaerobic nature of infection [17]. The other antibiotics recommended for use are penicillin, azythromycin, metronidazol [19].

Conclusions

Odontogenic inflammations can occur in the age group less than 3 years of age, even though the denture is still forming. Any inflammation in the upper jaw area with children under 3 years demands immediate consulting of a dental expert – oral or maxillo-facial surgeon. The observed tendency of rise of odontogenic inflammations in this age group shows the level of prophylactic of dental conditions.

Bibliography

1. Cabrera CE, Deutsch ES, Eppes S, et al. Increased incidence of head and neck abscesses in children. *Otolaryngol Head Neck Surg.* 2007;136(2):176–181.
2. Carter LM and Layton S. Cervicofacial infection of dental origin presenting to maxillofacial surgery units in the United Kingdom: a national audit. *Br Dent J.* 2009;206(2):73–78.
3. Khanna G, Sato Y, Smith RJH, et al. Causes of facial swelling in pediatric patients: correlation of clinical radiologic findings. *RadioGraphics.* 2006;26:157–171.
4. Roginskij VV, Vaylert VA, Kremenetskaya LE. Inflammatory infiltrates of the soft tissues in the craniofacial area of different origin in children. *Stomatology (Moscow).* 1984;63:43–46. (Article in Russian)

5. Roginskij VV, Ilina SB. Inflammatory processes in the craniofacial area in children. *Stomatology* (Moscow). 1983;62:30–32. (Article in Russian)
6. Roginskij VV, Korinskaya NN. Specific characteristics of the clinical course of inflammatory processes in the craniofacial area in children. *Stomatology* (Moscow). 1996;75:48–52.
7. Mateeva HT, Petkova EK, Indzhova KN. Propedeutics and prophylactics in child stomatology (coursebook). *Medicina i fizikultura*(Sofia). 1993;77. (in Bulgarian)
8. Vutov M, Krumova E. Treatment of dental conditions in children. *Medicina i fizikultura* (Sofia). 1988;43–68. (in Bulgarian)
9. Neychev D, Kirova D, Chenchev I. Clinical-statistical study of abscesses and phlegmons in the craniofacial area with children. Works of the Union of Bulgarian scientists Plovdiv /collected papers/. 2003;285–289. (Article in Bulgarian)
10. Neychev D, Kirova D, Pechalova P, et al. Clinical-statistical study of patients with inflammations in the mouth and craniofacial area 1990 – 1999. Works of the Union of Bulgarian scientists Plovdiv /collected papers/ 2002;369–374. (Article in Bulgarian)
11. Mateeva H, Krumova E, Stoilova R, et al. Epidemiology of deciduous teeth caries with children 3 – 10 of age. *Stomatology* (Sofia). 1996;1:10–13. (Article in Bulgarian)
12. Voorsmith RA. Abscesses caused by deciduous teeth. *Ned Tijdschr Tandheelkd*. 1999;106(1):4–9. (Article in Dutch)
13. Rustom IK, Sandoe JA, Makura ZG. Paediatric neck abscesses: microbiology and management. *J Laryngol Otol*. 2008;122(5):480–484.
14. Krishnan V, Jonson JV, Helfrick JF. Management of maxillo-facial infections: A review of 50 cases. *J Oral Maxillofac Surg*. 1993;51:868–873.
15. Neychev D, Pechalova P. A survey of the stay in hospital and period from clinical manifestation of symptoms to hospitalization of patients with inflammations and phlegmons in the mouth and craniofacial area. Works of the Union of Bulgarian scientists Plovdiv/collected papers/. 2003;290–294. (Article in Bulgarian)
16. Tom MB, Rise DH. Presentation and management of neck abscesses: a retrospective analysis. *Laryngoscope*. 1988;98:877.
17. Rush DE, Abdel-Haq N, Zhu JF, et al. Clindamycin versus Unasyn in the treatment of facial cellulitis of odontogenic origin in children. *Clin Pediatr*. 2007;46(2):154–159.
18. Gill Y, Scully C. The microbiology and management of acute dentoalveolar abscess: views of British oral and maxillofacial surgeons. *Br J Oral Maxillofac Surg*. 1988;26:452–457.
19. Sands T, Pynn BR, Katsikeris N. Odontogenic infection: Part two. Microbiology, antibiotics and management. *Oral Health*. 1995;85:11–14;17–21;23.

Modificările ontogenetice ale glicoproteinelor țesutului osos în condiții fiziologice, osteopatia experimentală și la remedierea cu substanțe autohtone

O. Tagadiuc

Biochemistry Laboratory, Nicolae Testemitanu State Medical and Pharmaceutical University
165, Stefan cel Mare Street, Chisinau, Republic of Moldova

Corresponding author: +37322205136. E-mail: olgatagadiuc@gmail.com

Manuscript received July 08, 2011; revised December 05, 2011

Ontogenetic changes in bone tissue glycoproteins in physiological conditions, experimental osteopathy and after correction with local remedies

An experimental study was done of ontogenetic changes in the carbohydrate components of glycoproteins and proteoglycans of bone tissue in rats under physiological conditions, in the experimental osteopathy, induced by the introduction of carbon tetrachloride, and after correction with cyanobacterial drug BioR, coordination compounds of copper CMT-28 and CMT-67 and their combinations. The study showed that maximum levels of the studied compounds have been reported in young and adult intact animals with a gradual decrease in the later stages of ontogeny. Statistically significant changes in the concentrations of hexoses, uronic acids, hexosamines and N-acetylneuraminic acid, which depended on the ontogenetic stage and the sex of the animal, were revealed in experimental osteopathy as a mechanism of bone adaptation. The study of the local drugs identified their protective effects, which were expressed in the preservation of high concentrations, and even increase of the content of the studied compounds. The effects depend on the drug used, the type of carbohydrate component, and ontogenetic stage of development.

Key words: bone tissue, ontogenesis, hexoses, uronic acids, hexosamines, ketoses, fucose, N-acetylneuraminic acid, cyanobacterian remedy, coordination compounds.