

Chemical Study of Antibiotics in Treatment of Non-septic Perimaxillary Suppurations in Pregnancy

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Physiological changes caused by pregnancy favor the onset or aggravation of preexisting buccal dental lesions, which, untreated, may evolve into infectious complications. Perimaxillary should be treated immediately due to the risk of infection spread or disseminated at a distance. Pain relief is an important reason for immediate treatment, as the particular state of nervousness can trigger a neuro-hormonal reflex followed by a break in pregnancy. The treatment of perimaxillary suppurations involves two main aspects: surgical management and medical management. Surgical management will apply as well as outside the pregnancy, recommending local or loco-regional anesthesia with 2% xylin and vasoconstrictor at very low doses. In medical management, it should be noted that the upcoming mother's ingestion of various drug substances is a matter of maximum responsibility. Drug administration during pregnancy should be an exceptional attitude, but strict application of this principle could deprive pregnant women of the use of useful drugs resulting in maternal complications and embryo-fetal suffering. The study is a retrospective and was performed on a batch of 70 pregnant women who presented themselves in the Oral and Maxillofacial Surgery Clinic during 2014-2017, presenting perimaxillary suppurations. Surgical treatment (opening and evacuation of the purulent collection), performed in all patients, was preceded by anesthesia, local or loco-regional. Preventive dental care should prevail over curative care in the case of dental treatments of women pregnant women, because all physiological changes caused by pregnancy aggravate the pre-existing oro-dental lesions. Prophylactic attitude will not allow the emergence of infectious complications of dental origin.

Keywords: physiological changes, pregnancy, oro-dental lesions, perimaxillary suppurations, surgical management, medical management

The morpho-functional changes of the maternal body during pregnancy are the consequence of adapting it to the new conditions created by the presence and necessity of the egg, causing a special physiological state. Adaptation of the human body to the pregnancy and to the hormonal invasion it performs is not done without putting some problems. Without touching the dimensions of a real pregnancy pathology, these disorders can induce an indisputable functional embarrassment. Body physiological changes during pregnancy are multiple and affect almost all organs and systems. The hormonal, metabolic and immunological system of pregnancy determines transient changes in oral tissues that may influence the onset and progression of dental conditions [1-3]. This influence is largely dependent on pre-existing oral health and consciousness with which prophylactic measures have been used both prior to conception, as well as during the gestation period [4-6].

Gingival changes caused by excess steroid hormones during pregnancy are consistent compared with those of the vaginal mucosa. Thus, the oral mucosa of the pregnant woman undergoes early changes marked by thickening of the corion and epithelium, hypervascularization, significant desquamation, and tendency to edema. These changes increase the receptivity of the gum to the action of irritating local factors: bacterial plaque, tartar, root remnants, improper prostheses or prosthetic work, sometimes reaching true pregnant gingivitis. Salivary changes seen in the pregnant woman are sialorrhea, decreased salivary pH (6.5-6.85), diminished saliva buffering power, decreased phosphorus and fluoride, increased phosphatase. Odontal changes are manifested by increased tooth relaxation due

to relaxin, increased incidence of caries, worsening and complication of pre-existing dental lesions [7-9].

During pregnancy there is the possibility of occurrence of oro-maxillo-facial infections. During pregnancy, a number of factors act, which in the presence of an oro-maxillo-facial pathology (dento-periodontal lesions, traumatic lesions, jaw osteomyelitis, salivary lithiasis, tumors of jaws, foreign bodies accidentally penetrated through the mucosa or tegument, pharyngeal-amygdalial infections, furunculus and pyoderma of the face, throat or head skin) or iatrogenic (non-compliance with the aseptic rules during anesthetic puncture, hot dental extractions, the possibility of alveolar drainage of the collection, traumatic extractions, incorrect dental treatments) lead to the evolution of the already existing diseases to perimaxillary septic complications. These favorable factors present during pregnancy are: hormonal, metabolic and immunological status of the pregnancy, abandoning oral hygiene, chosen in the first trimester pregnancy due to nausea, taste of toothpaste or brushing maneuver, is often followed by gingivitis, decreased salivary pH; neglect of dental treatments for the following reasons: pregnant women focus their attention on medical problems related to pregnancy and sometimes neglect other illnesses that seem to be secondary; it tends to postpone dental treatments that they consider to be disagreeable or even contraindicated to the normal development of the conceptional product; the recitment of some obstetricians or dentists to the dental treatments performed in the pregnant woman.

During pregnancy, some nonspecific or specific suppurations may occur in the perimaxillary soft tissues, which have various aspects depending on the anatomo-

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pathological form, localization, virulence of the causal germs, and the resistance of the organism to microbial aggressions[10-13].

The pathogenic mechanisms by which the suppurative processes of the soft parts are formed follow some paths, depending on their cause:

- the transosseous pathway, especially in processes that cause apical dental affections: periapical infection spreads progressively along the ventricles of the Havers (endosomal phase); the pathogenic germs, along with the pus, cross the jawbone and reach the periostasis, which initially takes it off (the subperiosteal phase) and then erodes it, opening its way into the perimaxillary soft tissues (the submucosal or diffusion phase in the perimaxillary lotions) ;

- the submucosal pathway encountered in suppurative processes due to periodontal disease, tooth eruption, maxillary fractures: the infection develops at the level of a pyorrheic sac under the mucous membrane or between the mucosa and the bone; the mucosa is decolorized, the suppurative process localizing superficially and even having the possibility of spontaneous opening;

- Lymphatic and venous routes, a situation found in cases where pharyngeal-amygdala, dento-periodontal or bone infection diffuses through the lymphatic vessels, localizing in perimaxillary lymph nodes, or via veins performing phleboplegmonous sowing.

- the direct path, encountered in the suppurations due to septic puncture, the presence of foreign bodies.

The pathways of germination are largely related to dento-periodontal and oropharyngeal diseases, tegumentary and rarely conjunctival, causative microorganisms present in perimaxillary suppurations originating in most cases from primary outbreaks. The evolution of a suppurative process is preceded and followed by ecological disturbances, which explains the variety of oral microbiogenesis[14-16]. Typically, the microbial flora is nonspecific, mixed, the presence of a pure culture in a perimaxillary infectious process being a sign of gravity. The most common are streptococci, bacteroids, fusobacteria, Veillonella, staphylococci, yeasts, clostridium, perfringens, etc. A noteworthy element is that sporadic anaerobic bacteria, of external origin, especially of tellurium, intervene in the traumatic pathology. Whenever wounds are associated with the infiltration of foreign bodies, vascular and muscular destruction, fractures, etc., favorable conditions for the development of histotoxic clostridiums are created and, fortunately, fever, tetanus and gangrene rarely occur[17-19]. Perimaxillary suppurations may have anatomopathological and clinical variation in different forms: the abscess constituting circumflexed suppuration in the form of a purulent content collection; the phlegmon diffuse form of suppurative processes; laryngeal lymph nodes, ganglion ruptures, parenchyma becomes brittle, small intraglandular inflamed outbreaks, perimaxillary fistulae, clinical manifestations of chronic, tremulous suppuration [20-22]. These suppurations begin in the form of small circumscribed abscesses with chronic evolution that give a minimum painful symptom; have a chronic evolution and spontaneously open, eliminating a small amount of pus.

Clinically, the non-specific infectious processes of the perimaxillary soft parts are systematized as follows: periosteal abscesses, abscesses of the superficial vessels; abscesses of superficial tiles; abscesses of deep lodges; phlegmones (diffuse suppurations), suppressed adenite, chronic fistula or mucous fistula. Perimaxillary suppurations are urgent and

therefore immediately intervene with curative treatment, due to the risk of extension of infection or dissemination at distance, causing various diseases of variable importance: endocarditis, pulmonary infections, digestive manifestations (gastritis, colitis), rheumatic manifestations, skin, eye, kidney, sinusitis, meningitis or even sepsis, with severe, sometimes fatal, development. Pain relief is an important reason for prompt treatment, as the particular state of nervousness can trigger a neuro-hormonal reflex followed by a break in pregnancy. Current therapies allow treatment under comfort conditions with minimal risk of spontaneous abortion or premature birth[23-25].

The curative treatment will be applied as well as outside the pregnancy, with the following statement: emergency interventions will be performed regardless of the age of pregnancy; calling for psychoprophylaxis is useful and important, aimed at removing pregnancy anxiety, usually overreacting by fear of intervention or physical pain; it is recommended to use premedication in all anxious patients (a minor tranquilizer from the group of benzodiazepines - Diazepam, Librium - orally, approximately 30-40 min preoperatively), the therapeutic indication will be analyzed with the obstetrician or generalist, to decide on the place, date and particular measures that are necessary for the case (diabetic field, anemia, cardiopathy, chronic nephritis, dystyria, etc.): laborious interventions will be avoided, short treatment sessions being preferred, avoiding fatigue and stress pregnant women; the radiological exam will be removed; the position of the pregnant woman during treatment is very important[26-28]; as the load is closer to the term, the prolonged dorsal decubitus and even the semi-sitting position should be avoided due to the possibility of the hypotensive decay syndrome occurring through the permanent compression of the inferior vena cava by the pregnant uterus; the occurrence of this complication requires the placement of the pregnant woman in the left lateral decubitus and the raising of the right hip by means of a pillow or a roller; local or loco-regional anesthesia with 2% xylene (max 4 ml) and a vasoconstrictor at very low doses; general anesthesia may be recommended at any time of pregnancy evolution, but second trimester is preferred; antibiotics and anti-inflammatory drugs should be avoided as far as possible, remembering that any medication given to the mother is also transmitted to the fetus; after surgery, the doctor must follow a patient's time to take prompt action in the event of a post-surgical bleeding; it is recommended to apply compressing meshes or additional sutures and gelspon sponges.

Curative conduction in perimaxillary suppositories involves a local-operator and postoperative treatment and a general, medical one[29-32].

The primary surgical treatment of the infection is to purge the purulent collection. This surgical treatment may have different degrees of difficulty.

In order to achieve a good evacuation of the purulent collections, both in endooral evolving and in those evolving in perimaxillary loops and requiring an exooral approach - it is necessary to make large incisions and necessarily to discover the purulent collection. Simply mucosal pricking in the endooral approach without "falling over" on the purulent collection, or paroxionic exooral incisions can aggravate the evolution of the septic process or, even more unpleasantly, after the gradual modification of the subjective and objective septic phenomena, it can lead to relapses and even the extension of the suppuration. Local, well-managed postoperative therapy is necessary to be associated with the surgical opening of suppurative

processes in the soft perimaxial parts, until the complete extinction of local and general phenomena.

Secondary surgery involves the removal of the causal cavern and can be done radically by extraction or by a method that allows the tooth to be preserved. This causal outbreak will only intervene in principle after the manifestation of perimaxial inflammation after surgical opening. First, it is necessary to support and stimulate the body. It will rebalance the hydroelectrolytic, carbohydrate, and antidiarrhoeal disease by appropriate nutrition, which will initially be mild with liquid and soft foods. When swallowing does not allow, parenteral administration should be used. The dysmorphic or teratogenic effect characterizes certain drugs and is conditional upon the dose, embryonic development stage, its genetic particularities, the physiological or pathological state of the mother.

As any toxic effect, teratogenicity occurs when the drug achieves high concentrations in the target tissues or embryo respectively.

During pregnancy, it is necessary to establish active dental care, predominantly prophylactic, early, planned, systematic and obligatory.

The purpose of the work is to specify the therapeutic behavior of perimaxillary suppositories during pregnancy.

Experimental part

The study is retrospective and was performed on a batch of 70 pregnant women who presented themselves at the Oral and Maxillofacial Surgery Clinic during 2014-2017, presenting perimaxial suppositories.

The respective pregnant group was taken into account: the age, the environment of origin, the pathological manifestations with which they were presented: diagnosis, therapeutic measures, the evolution of the pregnancy after the treatment. Registered cases, grouped by type of pathology, are systematized, with the specificity that there was no case of phlegmon.

Results and discussions

In the studied group, looking at the infectious pathology encountered by age groups, it was found that it occurs at all ages, however prevailing in the age group 21-35 years, which coincides with that of the woman's maximum fertility.

Analyzing the pregnancy environment, the predominance of perimaxial suppositions with those in rural areas (62.85%) compared to urban ones (37.14%) was found, revealing a deficiency of health education for women in rural areas. There was an increased incidence of maxillofacial infectious pathology in the third trimester of pregnancy (48.57%), which is evidence of ineffective dispensarization of periodontal status and worsening of this pathology during pregnancy evolution. The small incidence in the first trimester of pregnancy is also explained by the fact that many women in the first weeks of pregnancy do not know they are pregnant. Therefore, the doctor should consider the possibility of pregnancy in women from 15 to 45 years of age outside these age limits is rare but possible. Patients who are not yet safe if they are pregnant will be treated as pregnant as long as there is no contrary finding by the obstetrician.

Infectious maxillo-facial pathology encountered in the studied group was represented by:

- 24 cases of periosteal abscesses, representing 34.28%;
- 38 cases of superficial suppurations, representing 54.28%;
- 4 cases of deep lodge suppurations, associated with surface topsoil suppurations, representing 5.71%

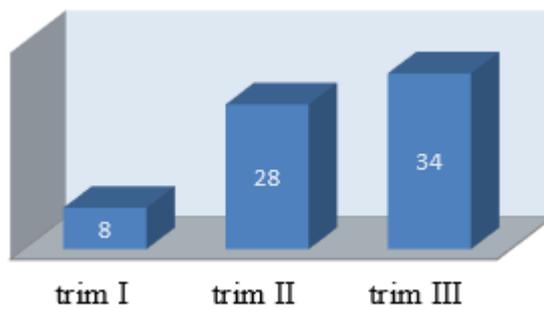


Fig. 1. Distribution of cases by load periods

- 2 cases of adenitis, representing 2.85%
- 2 chronic perimaxillary fistula cases, representing 2.85%;
- There was no case of phlegmon.

All patients were treated both surgically and medically, except for one that did not require medication.

Surgical treatment involves a main intervention, which follows the drainage of the purulent-incision collection, evacuation, drainage - and secondary intervention, removal of the cause - either conservative (apical resection, periapical curettage, radical amputation) or radical (dental extraction). The pregnant woman with perimaxillary perforation required urgent, surgical and medical treatment.

The surgical treatment (opening and evacuation of the purulent collection), performed in all patients, was preceded by anesthesia, local or loco-regional, performed with 1-2% xylene without vasoconstrictors.

Medical treatment involved the administration of antibiotic, anti-inflammatory drugs, non-steroidal anti-inflammatory drugs - generally, taking into account the patient's particular gravity, where a number of drugs are contraindicated.

Among the most commonly used antibiotics were ampicillin (34.28%), penicillin (22.85%), amoxicillin (20% and cefotaxime (17.14%).) Because ampicillin was used in a percentage of 34, 28%, we will present its chemical status.

Chemical ampicillin study

Penicillin has the chemical formula $C_{9}H_{11}N_2O_4S$, is an antibiotic with a relatively reduced bactericidal spectrum against Gram-negative germs, which has led to its derivatives as ampicillin having a bactericidal spectrum against gram negative and gram-positive.

Penicillin is used in oral infections with Gram-positive and Gram-negative germs, treponema palidum, periodontal-ulcer-necrotic gingivitis, juvenile periodontitis, refractory periodontitis.

Ampiciline: Peniciline A

Ampicillin is a broad spectrum penicillin antibiotic, indicated in various respiratory-localized bacterial infections and otorhinolaryngologic infections (bronchitis, pharyngitis, sinusitis), digestive and urogenital infections.

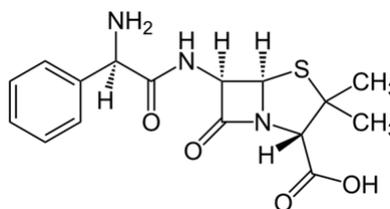


Fig. 2. Structural formula of ampicillin
Chemical formula
 $C_{16}H_{19}N_3O_4S$
Molar mass 349.41 g/mol

The majority of the antibiotics (penicillins and cephalosporins) administered belong to the category of drugs allowed during pregnancy. Only three cases were administered an antibiotic with possible fetal risk (gentamicin), situations motivated by the general altered condition of the pregnant women; balancing the fatal risk of pregnant women with teratogenic risk.

No complications of pregnancy evolution during the treatment were reported in any patient, and no complications or malformations after treatment could be identified.

In relation to the often phobic preoccupation for the future of the pregnancy, for its result, the dental problems remain psycho-affective at the second level, the concern for the oro-dental health in this context is also dependent on the social and family environment from which she is pregnant, their/ her degree of education and his / her health education.

From this point of view, the pregnant woman needs to be hospitalised; a thorough health education on nutrition, oro-dental hygiene and the need for dental control will have to be carried out at least quarterly.

Conclusions

In the third trimester of pregnancy, the prevalence of maxillofacial infectious pathology in pregnant women in rural areas was 21-35 years old.

From infected pathology, a higher percentage was the periosteal abscess (34.28%) and suppurations in the superficial deposit (54.28%):

Particular emphasis should be placed on systemic dental control and treatment in preconceptions and prenatal counseling, possibly including these procedures in the minimum scale set by Romanian insurance houses.

Oral hygiene is very important to prevent the occurrence of odon and gingival/gum lesions. Therefore, except gentle and correct brushing, fluoride mouthwash, fluorinated gels and a rational diet rich in protein, vitamins, mineral salts and lower hydrocarbon compounds are recommended

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