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ORTHODONTIC TREATMENT AND CHEMICAL AGENTS IN CONGENITAL MALFORMATIONS OF CEPHALIC REGION

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ABSTRACT

The state of health of the dento-maxillary apparatus presupposes the morpho-functional integrity and the harmonious, proportional development of all the component elements, so that the relations between teeth, between arches and jaws are within the limits of phylogenetic variables, and their functioning is coordinated, automated through an integrated adjustment system that stimulates the consolidation of shapes. The ideal in orthodontics is to obtain an optimal morpho-functional function of the dento-maxillary apparatus. In order to better understand and be able to explain some aspects of intrauterine development, growth and differentiation, modern physiology has sought to decipher the most intimate aspects of the plantar filter, the way through which all the influences of the external environment, represented by the mother's body, are transmitted to the fetus. Malformation is invalidated by its consequences on multiple levels: aesthetic, psychological, speech, nutrition, associated malformations. Material and method:
The study includes 54 cases of cleft lip and palate: 36 are male and 18 are female. Results and discussions: The causal factors act in the first 10 weeks of pregnancy in the organogenesis phase of the embryo, when the structures of the middle part of the face are formed. The condition can be diagnosed from the fifth month of pregnancy, by ultrasound examination, but this is not always possible, depending on the position of the fetus, but also on the performance of the device, as well as the experience of the doctor performing ultrasound. Conclusions: Risk of splitting labiale- maxillo-palatine, is approximately equal for untreated maternal epilepsy or under treatment. Regarding maternal age, the study revealed a maximum risk in young mothers.

Keywords: labio-maxillo-palatine splitting, malformations, orthodontic treatment.

INTRODUCTION

The cleft lip and palate are the most common congenital malformations of the cephalic region and involve a variety of abnormalities in the upper lip and upper jaw, sometimes in the nose and hearing, involving a lack of uni- or bilateral substance in the cephalic affected area.

The oro-maxillo-facial territory is frequently the site of congenital malformations that take on different anatomical-clinical forms, in relation to the structures concerned[1-4].

They may be limited to the soft parts, may also affect the skeleton of the visceral skull and may also be associated with malformations of the neurocranium, limbs,

etc. The malformations are due to disorders of embryological development of the brachial arches I and II; some are very rare and even exceptional, others have a special frequency and pose difficult treatment problems.

The etiopathogenesis of the clefts has been studied in detail but is still poorly elucidated, it is considered to be the result of the interaction between different genetic factors and the environment (exogenous).

The teratogenic action depends on the so-called embryological schedule. After the end of the critical period specific to each organ, the period in which it is formed, the teratogenic agents no longer have any malformative action. The same teratogen can cause various malformations, depending on when it acts[5-7].

Among the chemical agents, an important role is played by drugs. The interest of the medicinal action on the embryo has increased after the impact caused by the use of thalidomide. Aminopterin and other folic acid antagonists (such as Dilanthine) also have a teratogenic action. A number of antibiotics (Hadacidin) or antimitotics (cytostatics) are capable of producing malformations. Although he did not notice the appearance of malformations in humans, Trasler recommends avoiding aspirin, which has caused cracks in mice.

The influence of physical factors, radiation on cell division is due to the discoverer of uranium radioactivity, H. Becqerel. The effect of radiation depends on: the ability to penetrate; energy absorbed by irradiated tissue; relative ionization density; cell radiosensitivity which is directly proportional to the ability to proliferate and inversely proportional to the degree of differentiation and varies depending on the species.

Regarding the sources of contamination of the human body, they can be grouped into two categories: natural radiation and artificial radiation[8-12].

Throughout history, literary and artistic documents, coming from various ancient and mediaeval civilizations and cultures, attest to the presence of different peoples, the presence of facial malformations and especially cleft lip and palate (DLMP). They are the most common congenital malformations of facial structures, known as 'rabbit lip' or 'wolf mouth'. It comes in the form of dehiscences or continuity solutions that cross the upper lip sagittally, the nasal floor, the alveolar ridge, the palatal arch and the palatal veil and interests these structures on different stretches. The causes of these malformations are multifactorial, involving both genetic factors, maternal diseases (diabetes, obesity, folic acid deficiency) and environmental factors (drugs, chemicals, smoking, alcohol consumption, virusal infections).

The appearance of fissures is due to disorders in the embryonic development of the buds from which the lip, upper jaw and palatine vault are formed. It is known that the organogenesis of the oral cavity ends in the 3rd embryonic month, malformations occurring through disorders[13-17].

The finding that sometimes cleft lip and palate are accompanied by both antecedents and collaterals, with malformations of other segments of the body, may prove the involvement of genetic 'nodules', with somatic consequences at different levels. Thus, the clefts can be included in some chromosomal abnormalities that cause general syndromes, such as Treacher-Collins, Pierre-Robin and Klippel-Fiel.

Treacher-Collins syndrome, or mandibulo-facial dysostosis, has an autosomal dominant substrate. It is characterized by hypoplasia of the zygomatic bone and mandible, which has a retrognathic position, along with eyelid

fissures, malformations of the ear structure and hearing impairments; 30% of cases have cleft lip and palate.

In some familial cases, mutations of the MSX1 gene have been identified that associate with dental abnormalities, with autosomal-dominant transmission, mutations of the TBX22 gene, with X-linked transmission. In the occurrence of cleft lip or palate may be involved the VAX1, FGFR2, BMP4, IRF6, too. As the causes of these malformations are not yet fully known, it is certain that during embryogenesis, fusion abnormalities of the five facial buds (fronto-nasal buds, two maxillary buds and two mandibular buds) appear, with various phenotypic expressions.

Fragmentation of the upper lip (cheilodisrafiesof the lip, cleft lip), also known as the "rabbit lip" can involve partly or wholly lip, (keilon – rim, lip and schizis - separate). Labial fragmentation is more common in males, due to the lack of welding between the maxillary and medial nasal muscles; it is usually unilateral on the left side, but can also be bilateral, especially in some syndromes or trisomies. Fragmentation labio -maxilar (cheilo-gnato-disrafia, labio-maxillary cleft) occurs when the lip is associated with the division of al or part of the previously palate; it can be uni- or bilateral[18-21].

Fragmentation of the posterior palate can also be isolated, without labial fragmentation, can interest the entire hard palate or partially and are called velo-palatine fragmentation (staphylurano-dysraphy, palatal splits); if you are interested in only the soft palate (velum and palate), at ounce this type of fragmentation are called divisions velars (stafilo-disrafii, velum bifida). Velo-palatine fragmentation, vomer palate can be attached to a blade (fragmentation palate-sided), and the division of bilateral palate remains free, not adherent. The fragmentation also interests the totality of the hard and soft palate and the upper lip, it is called labio-maxillo-palatine division (cheylo-gnato-palato-dysraphy); it can be unilateral or bilateral, being also known as "wolf's mouth" the oral cavity can communicate with the nasal cavity, prevents sucking in infants, fluids flow through the nose, there is a risk of aspiration, and frequent upper respiratory infections occur ; the cause of bone diastasis, the anatomical ratios are altered, the Eustachian tube is shorter and more horizontal, making it easy for microbial communication between the pharynx and the middle ear, with an increased risk of otic infections. Schizocephaly or fragmentation of the upper lip is due to fusion of the medial nasal buds and lack of intermaxillary bone formation. It is a rather rare malformation, being a pathognomonic symptom of Mohr syndrome, a syndrome that is transmitted autosomal recisively → rabbit lip.

Labio-maxillo-palatine clefts are a current medical problem, particularly with regard to surgical recovery. An early surgical recovery restores the integrity of anatomical structures, restores disordered functions, creates favorable conditions for speech education and social adaptation of the child according to age.

The procedure is applied before primary suture above the lip and palate, in order to minimize the dislocation of the arch segments maxilar. If the pacient with complete unilateral cleft is examined after birth, it will be seen that the greater portion of the segment is rotated premaxilarly above and to the healthy side. The correction can be done with a plaster cast of the jaw and palate. The model will be sectioned, and the obtained segments will be distributed so as to obtain a more correct (almost normal) configuration of the region.

MATERIAL AND METHOD

The study aims to perform a statistical analysis on a group of patients with cleft lip and palate, hospitalized in the OMF Surgery Clinic during August 2019-July 2020 , in order to establish plastic surgery or interventions plastics at the level of postoperative sequelae.

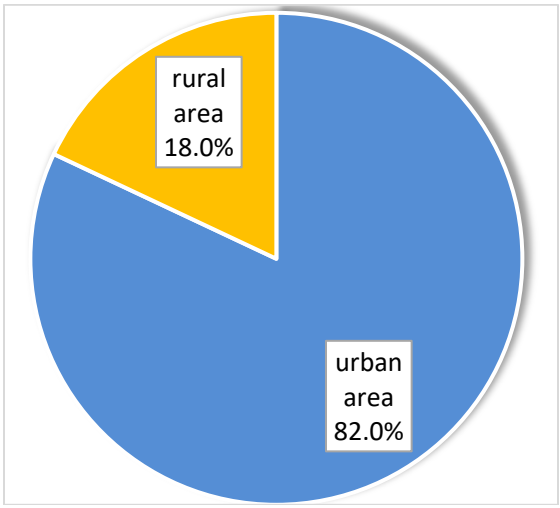

Fig. 1 Distribution of patients according with the environment of origin

In the studied group, the frequency distribution of the anatomical-clinical forms of cleft lip and palate, the highest percentage being recorded by the total bilateral clefts - cleft lip 39 %; Regarding the environment of origin, urban or rural, their percentage is the urban environment-82%; rural environment - 18%(Fig. 1).

RESULTS AND DISCUSSIONS

The study group consisted of 54 patients with cleft lip and palate, of which 38 boys and 18 girls, who presented to the clinic for the establishment of specialized treatment(Fig. 2).

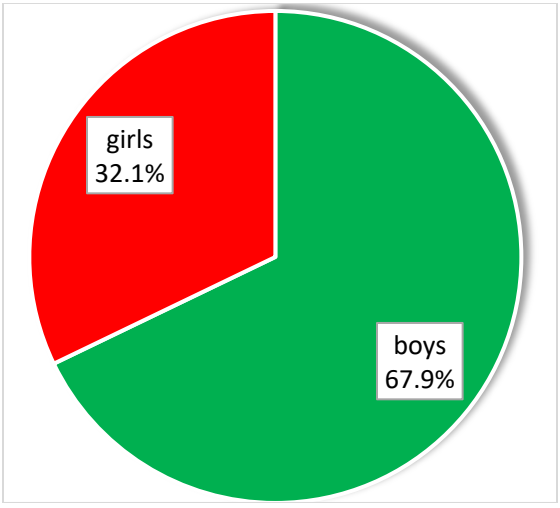

Fig. 2 Distribution of patients according with gender

The malformation is disabling due to its consequences on multiple levels: aesthetic, psychological, speech, nutrition, associated malformations, so therapeutic management begins with antenatal diagnosis and continues with postnatal.

The cleft lip and palate are the most common congenital malformations of the cephalic region and the second most common congenital malformation in newborns, involving a variety of abnormalities in the upper lip and upper jaw.

The clinical picture is dominated by the mutilating appearance given by the malformation characteristic of each type of cleft and by the functional disorders that manifest immediately from birth or that become evident with the growth of the child.

In incomplete anterior clefts, functional disorders are small, breast sucking is possible; in complete anterior clefts sucking is difficult, sometimes impossible, so children should be fed with a teaspoon.

In total clefts, eating disorders are more serious, natural breastfeeding is impossible, children can not suck, unable to achieve oral vacuum, and food flows back through the cleft palate, passing into the nose. Children have severe swallowing disorders, so feeding can only be done with difficulty, requiring a long time: swallowing disorders are gradually improved by adaptation, children come to balance their ability to eat, however food, especially liquids, flow back into the nose, even in people with age splits adult.

Phonation disorders are very pronounced in the splits of the vault and the veil. The defects are of particular interest to the labial, dental, palatal phonemes which are pronounced completely defective, sometimes even unintelligible. Speech impairment specific to posterior cleft is the most important and alarming disorder, along with the physiognomic defect.

There is a hypertrophy of the tonsils, which can be considered a compensatory process, narrowing the pharyngo-palatal gap and thus improving phonation.

Alveolo-palatal clefts are accompanied by disorders in the development and eruption of teeth; position abnormalities, vicious, ectopic eruptions occur, the development of the jaw is influenced (micrognathia, endogenation, endalveolia).

Cleft lip and palate are a current medical problem, especially in terms of surgical recovery. An early surgical recovery restores the integrity of anatomical structures, restores disordered functions, determines favorable conditions for speech education and social adaptation of the child according to age.

Orthodontic treatment in the studied cases consisted in expanding the upper arch to achieve a normal occlusion, followed by the alignment of the teeth; this expansion will not be stable, requiring permanent restraint.

The procedure is applied before the primary suture of the lip and the anterior palate, to minimize the dislocation of the segments of the maxillary arch.

Correction of the malformation of the maxillary arch in the case of bilateral clefts is much more difficult, but it is of increasing importance due to the difficulty of reconstructing the muscular plane and severe deformities, which will persist if the segments cannot be aligned.

In bilateral clefts, the lateral segments are displaced medially and the median segment is protruding. The purpose of preoperative orthodontic treatment is to reposition the lateral segments so that the middle segment can be coaxed between them as a keystone of the maxillary arch[22-26].

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The antenatal and immediately postnatal diagnosis is continued by the orthodontic treatment.In practice, there are three situations in which preoperative orthodontic treatment is extremely necessary: unilateral labio-palatal splits complete with collapse of the small maxillary segment; unilateral labio-maxillary clefts with small segment obliquity; bilateral splits complete with collapse of the lateral segments and moderate protrusion of the middle segment. However, the treatment is complex and the following stages are mainly related to specialists with dental training, which is why one considers that the most complete and competent treatment can be given by oro-maxillo-facial surgeons, in accordance with European norms[32-36].

Orthodontic treatment, if necessary, should be started from the age of 3 months, all medical and surgical interventions aim to restore an aesthetic and morphological aspect as close as possible to normal, as well as ensuring normal psychosomatic and emotional development, evolving on favorable long-term.Early orthodontic treatment refers to the alignment of the teeth and the correction of cross occlusions or reverse gears in the decidual dentition or mixed dentition. The goals of orthodontic treatment at this time are to correct any frontal reverse gears, posterior lateral reverse occlusion.

Speech therapy (phoniatric) is more intense between 6-11 years, but can begin even earlier this age. The most affected disorder that occurs and causes poor phonation is the emission of air through the nose during speech (open rhinolalia). Appearance occurs when the palatal veil cannot come into contact with the posterior wall of the pharynx, or when it has mobility disorders or in the presence of oronasal fistulas[37-40].

The role of chemicals was highlighted later and it is not yet possible to establish a definitive list of chemicals, drugs, toxins and hormones that can cause malformations.

The pathophysiological hypotheses regarding ovarian lesions due to maternal intoxication are largely based on experiments performed on animals. Through these experiments, many substances have been shown to have a teratogenic effect, although agents recognized as dangerous to humans are rarer. There is a claim that a drug that has no pathological effects on the offspring of different species of laboratory animals is not dangerous to the human embryo. In reality, things are completely different.

The genetic constitution of an individual determines his sensitivity to a toxic agent. An agent can cause a malformation in one species and not influence another. Even within the same species there are great variations from individual to individual[41,42].

If the human embryo is usually less vulnerable than the animal embryo, we must not forget that 10,000 malformations occurred in Europe by extrapolation to the human species of experimental teratogenesis researchers proving the safety of Thalidomide. The only convincing data for the species human are the findings made by man. Thus, a drug will be considered safe for the human embryo, only after it has been

administered to several thousand pregnant women.

Among the industrial toxins we must consider the following: benzene, causes anemia with leukopenia, coagulation disorders, miscarriages and premature births or hemorrhages in delivery, lead, harmful to placental villi; mercury causes abortions and perinatal deaths by directly touching the egg or as a result of maternal nephropathy.

Carbon monoxide poisoning is committed by suicide, or accidentally, is common and does not spare the pregnant woman.

CONCLUSIONS

Malformations defects is a major problem of public health and complex to be addressed systematically and interdisciplinary modern principles.

The treatment of cleft lip and palate includes a surgical as well as an orthodontic stage which consists in the application of specific orthodontic appliances that can be prefabricated or made individually.

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