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13.00.00 Pedagogika fanlari
13.00.01 Pedagogika nazariyasi. Pedagogik ta'limotlar tarixi
13.00.02 Ta'lim va tarbiya nazariyasi va metodikasi (sohalar bo'yicha)
13.00.03 Maxsus pedagogika
13.00.04 Jismoniy tarbiya va sport mashg'ulotlari nazariyasi va metodikasi
13.00.05 Kasb-hunar ta'limi nazariyasi va metodikasi
13.00.06 Elektron ta'lim nazariyasi va metodikasi (ta'lim sohalari va bosqichlari bo'yicha)
13.00.07 Ta'limda menejment
13.00.08 Maktabgacha ta'lim va tarbiya nazariyasi va metodikasi
13.00.09 Ijtimoiy pedagogika
07.00.00 Tarix fanlari
19.00.00 Psixologiya fanlari
01.00.00 Fizika-matematika fanlari
02.00.00 Kimyo fanlari
03.00.00 Biologiya fanlari
09.00.00 Falsafa fanlari
10.00.00 Filologiya fanlari
11.00.00 Geografiya fanlari

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MUNDARIJA СОДЕРЖАНИЕ CONTENTS

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MUNDARIJA СОДЕРЖАНИЕ CONTENTS

MUNDARIJA СОДЕРЖАНИЕ CONTENTS

RESEARCHING THE BIOCHEMISTRY AND PHYSICAL CHEMISTRY OF ORAL FLUID IN KIDS WHO ARE ACTING STRANGELY

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Abstract: The purpose of this study is to examine the physicochemical and biochemical characteristics of oral fluid in a control group consisting of healthy children and in children who have had residual issues after undergoing uranoplasty for congenital cleft palate.

In the study, there were 109 children between the ages of 6 and 12 who had congenital cleft palates and residual defects following uranoplasty. Additionally, there were fifty children of the same age who were essentially sound.

Results and discussion are included. In addition to the challenges that arose during uroplasty, there were significant physicochemical and biochemical issues that were present in the saliva of infants who were born with a congenital cleft palate.

Additionally, these data serve as a basis for later research and the development of approaches that are intended to improve the composition of oral fluid for the purpose of progress.

Salivation, gingivitis, congenital cleft palate, surgical palate deformity, and the biochemistry of intraoral fluids are some of the keywords that are associated with this topic.

Key words: salivation, gingivitis, congenital cleft palate, postoperative palate deformity, biochemistry of oral fluid.

Annotatsiya: Ushbu tadqiqotning maqsadi sog'lom bolalardan iborat nazorat guruhida va tug'ma tanglay yorig'i sababli uranoplastika o'tkazilgandan keyin qoldiq muammolari mavjud bo'lgan bolalarda og'iz suyuqligining fizik-kimyoviy va biokimyoviy xususiyatlarini o'rganishdan iborat.

Tadqiqotda 6 yoshdan 12 yoshgacha bo'lgan, tug'ma tanglay yorig'i va uranoplastikadan keyingi qoldiq nuqsonlari mavjud 109 nafar bola ishtirok etdi. Bundan tashqari, shu yoshdagi deyarli sog'lom 50 nafar bola ham ishtirok etdi.

Natijalar va muhokama keltirilgan. Uroplastika jarayonida yuzaga kelgan qiyinchiliklardan tashqari, tug'ma tanglay yorig'i bilan tug'ilgan bolalarning so'lagida sezilarli fizik-kimyoviy va biokimyoviy muammolar mavjud edi.

Bundan tashqari, ushbu ma'lumotlar keyingi tadqiqotlar va taraqqiyot maqsadida og'iz suyuqligi tarkibini yaxshilashga mo'ljallangan yondashuvlarni ishlab chiqish uchun asos bo'lib xizmat qiladi.

So'lak ajralishi, gingivit, tug'ma tanglay yorig'i, tanglayning jarrohlik deformatsiyasi va og'iz bo'shlig'i suyuqliklarining biokimyosi ushbu mavzu bilan bog'liq kalit so'zlardan ayrimlaridir.

Kalit so'zlar: so'lak ajralishi, gingivit, tug'ma tanglay yorig'i, operatsiyadan keyingi tanglay deformatsiyasi, og'iz suyuqligi biokimyosi.

Аннотация: Целью данного исследования является изучение физико-химических и биохимических характеристик ротовой жидкости в контрольной группе, состоящей из здоровых детей, и у детей, имеющих остаточные проблемы после проведения уранопластики по поводу врождённой расщелины нёба.

В исследовании приняли участие 109 детей в возрасте от 6 до 12 лет с врождённой расщелиной нёба и остаточными дефектами после уранопластики. Кроме того, в исследовании приняли участие 50 практически здоровых детей того же возраста.

Представлены результаты и обсуждение. Помимо трудностей, возникших в ходе уропластики, в слюне детей, родившихся с врождённой расщелиной нёба, присутствовали значительные физико-химические и биохимические проблемы.

Кроме того, эти данные служат основой для последующих исследований и разработки подходов, предназначенных для улучшения состава ротовой жидкости в целях прогресса.

Слюноотделение, гингивит, врождённая расщелина нёба, хирургическая деформация нёба и биохимия внутриротовых жидкостей являются некоторыми из ключевых слов, связанных с данной темой.

Ключевые слова: слюноотделение, гингивит, врождённая расщелина нёба, послеоперационная деформация нёба, биохимия ротовой жидкости.

INTRODUCTION

There is communication between the oral and nasal cavities, postoperative scarring alterations, pathological bacterial contamination, dental crowding, and a significant prevalence of dental caries and periodontal diseases, which are the primary reasons for the examination of oral fluid composition in children with congenital cleft palate and residual defects following uranoplasty. This examination was primarily motivated by the presence of these factors.

LITERATURE REVIEW

Studying the immune system and gaining a better understanding of how it functions is becoming an increasingly important endeavour. Periodontal diseases that are characterised by chronic inflammation and the chronic illnesses that are linked with them have a significant impact on the biochemical and immunological status of the oral cavity [1-5]. By investigating the immunological characteristics of bioactive body fluids, it is feasible to determine the kind of inflammatory reactions that occur as well as the kinetics of the response to therapeutic interventions [6-11]. There is a lack of understanding about the immunological defence systems that are present in the oral cavities of children, especially those children who have cleft palates [12-20]. This is despite the fact that there is a body of relevant material.

Cleft palates provide a challenge for children since there is no barrier between their nasal route and their oral cavity. This makes it difficult for them to swallow. Due to the fact that these infants are more susceptible to somatic and dental anomalies, they are at a greater risk of experiencing unsatisfactory surgical results during remedial surgeries during the early stages of infancy. There is a possibility that 18% to 30% of individuals would have difficulties after surgery to correct congenital palatal abnormalities (primary uranoplasty) [23, 24]. This is due to the unique issues that are associated with congenital abnormalities, such as the absence of native palatal tissue, the weakening of muscle fibres, and the ineffectiveness of healing processes in comparison to what they should be. Wounds that do not heal fully and the development of palatal perforation are the forms of complications that are most often seen in these instances. Main palate cosmetic surgery has as its main objective the restoration of the integrity of the velopharyngeal ring, which is an important component of speech therapy for children in the early years of infancy.

There is a lack of consensus among maxillofacial surgeons on the most effective method of surgically correcting congenital cleft palates in infants. Other surgeons advocate for a two-stage procedure that involves cosmetic surgery of the front palate as the upper jaw grows after the early repair of the velopharyngeal ring. Some surgeons prescribe a single-stage uroplasty commencing at the age of two, while others offer a two-stage method. Palatal anomalies, which are frequent in children and adolescents, are abnormalities in the front region of the mouth that allow air and nasal secretions to enter the mouth. It is much simpler for harmful germs that originate in the nasal cavity to settle in the mouth when this environment is present. Caries and periodontal disease in children are made worse by the lack of a natural border between the mouth and the nose, which reduces the ability of saliva to remineralise teeth [1, 3, 12, 23-24].

Numerous studies have shown that cytokines have a crucial role in the beginning stages of inflammatory responses that occur inside periodontal tissues. The presence of pathogenic dental plaque is the first element that sets off the chain of events that ultimately results in the generation of pro-inflammatory cytokines and

MAKTAB TA'LIMI SCHOOL EDUCATION ШКОЛЬНОЕ ОБРАЗОВАНИЕ

the activation of periodontal macrophages [1-7, 10-20]. Anti-inflammatory cytokines, such as IL-4 and IL-10, play a crucial role in regulating the inflammatory process. On the other hand, pro-inflammatory cytokines, such as IL-1β, IL-6, and TNF-α, exacerbate the situation and cause damage to periodontal tissues. It is considerably simpler to identify inflammatory illnesses when there are changes in the cytokine composition of oral fluid [1-7, 10-20].

There is a variety of immunoactive substances that are often found in saliva. These compounds include lysozyme, immunoglobulins, antimicrobial peptides, lactoferrin, and others. These chemicals are responsible for maintaining the equilibrium of oral mucosal immunity. Saliva contains a substance known as secretory immunoglobulin A (sIgA), which is the most sensitive indicator of changes in the immune system in the mouth. Because of the high level of biological activity that this protein has, it may be used for a variety of defense-related purposes. By binding to bacterial cells and the toxins they produce, it prevents the poisons from adhering to the mucous membrane. In addition to this, it prevents viral particles from entering the circulation and brings about a shift in the manner in which mucosal cells absorb and proliferate virus particles.

Researchers have shown that children who suffer from severe caries and inflammatory periodontal illnesses had lower amounts of sIgA in their saliva. This decrease is statistically significant, according to the findings of the studies. Previous studies have investigated the levels of immunoglobulin A (sIgA) in children of varied ages who were born with congenital cleft palates [1, 3, 12].

The results of their investigation showed that there is a discernible pattern of decreasing sIgA concentrations. Significantly higher levels of sIgA are seen in patients with mild chronic generalised periodontitis, surpassing the values of the control group by a factor of 1.5. It seems from this that the levels of sIgA in inflammatory periodontal disorders may be subject to fluctuations. When compared to the control, this value in moderate and severe periodontitis is reduced by 1.5 and 3 times, respectively, in comparison to the control. Saliva contains a key immunoglobulin called sIgA, which helps fight against germs by clumping them together and preventing them from multiplying. This is the reason why this occurs. The fact that the body produces more sIgA as the severity of periodontal disease increases lends credence to the notion that this is a mechanism by which the body defends itself against the inflammation. The opposite is true for moderate to severe instances, which result in an imbalance between inflammatory and anti-inflammatory responses owing to the decrease in local immunity [1-3, 7, 12, 13, 17-19].

It is essential to have a thorough understanding of the physical link that exists between the nasal cavity and the oral cavity, as well as the existence of pathogenic microflora in the mouth and surgical scars, since all of these factors have the potential to influence the progression of the problem.

RESEARCH METHODOLOGY

The purpose of this research is to provide the findings of an investigation into the composition of oral fluids in fifty children of the same age who were, on the whole, in good health, as well as in one hundred and ninety-nine children aged six to twelve years old who had undergone uranoplasty and continued to have difficulties. The primary group includes the diagnosis of nonsyndromal congenital cleft lip, alveolar process, soft and hard palate, the condition post-uranoplasty and cheilorhinoplasty (in cases of cleft lip), and the presence of a post-operative palate defect at least six months after uranoplasty. In addition, the condition includes the presence of a soft palate. In addition to the lack of exacerbations of infectious or chronic illnesses, the consent of parents or legal guardians to participate in the study was taken into consideration. Measuring the pH of the saliva that has been mixed. Viscosity, at a value of μ. When the salivary glands are not stimulated, the rate at which saliva is produced (measured in millilitres per minute).

ANALYSIS AND RESULTS

An analysis was conducted to determine the viscosity of saliva. The control group had a viscosity of 1.06 ± 0.073 mm² × s, whereas babies with congenital cleft palates and residual abnormalities had a viscosity of 2.43 ± 0.137 mm² × s or higher. This change demonstrates that the saliva of the cleft group is less capable of mineralising and cleansing items of their own will. The pH of the saliva of children who had cleft palates was measured to be 6.47 ± 0.067, while the pH of the saliva of children who were healthy was measured to be 7.24 ± 0.058. As a result of having a lower pH, children who have a cleft palate have a decreased capacity for mineralisation in their saliva, which may result in the development of cavities and gum disease. The salivation rate of children with congenital cleft palates and residual abnormalities was found to be 0.28 ± 0.039 ml/min, which is significantly lower than the salivation rate of 0.44 ± 0.054 ml/min that was seen in children who were healthy. It was observed that the protein level in infants who were born with a congenital cleft palate and residual abnormalities was lower (0.851 ± 0.535 g/L) compared to the protein level in children who were in the healthy group

(1.68 ± 0.519 g/L). When saliva contains the appropriate proportions of calcium and phosphorus, it helps to maintain the strength of teeth by preventing them from deteriorating and providing them with the ions that they need on a consistent basis.

Infants who have a congenital cleft palate and who continue to have problems after undergoing uranoplasty have abnormalities in the physicochemical and biochemical characteristics of their oral fluid. The results of this research indicate that the physicochemical and biochemical equilibrium of the oral fluid is significantly altered in neonates who were born with congenital cleft palates and who had undergone uranoplasty and received residual abnormalities. Scars from surgical procedures, alterations in microbial colonisation, and the physical connection between the nose and oral canals all contribute to a reduction in the effectiveness of the local defence systems.

CONCLUSION AND SUGGESTIONS

According to the results of our study, there are a number of significant disparities between the mouths of the research group and those of healthy controls, including the following: The self-cleaning and lubricating properties of saliva seem to be deteriorating, as shown by a considerable increase in salivary viscosity (2.43 ± 0.137 mm² × s) and a reduction in salivary flow rate (0.28 ± 0.039 ml/min).

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13.00.00 Pedagogika fanlari
13.00.01 Pedagogika nazariyasi. Pedagogik ta’limotlar tarixi
13.00.02 Ta’lim va tarbiya nazariyasi va metodikasi (sohalar bo‘yicha)
13.00.03 Maxsus pedagogika
13.00.04 Jismoniy tarbiya va sport mashg‘ulotlari nazariyasi va metodikasi
13.00.05 Kasb-hunar ta’limi nazariyasi va metodikasi
13.00.06 Elektron ta’lim nazariyasi va metodikasi (ta’lim sohalari va bosqichlari bo‘yicha)
13.00.07 Ta’limda menejment
13.00.08 Maktabgacha ta’lim va tarbiya nazariyasi va metodikasi
13.00.09 Ijtimoiy pedagogika
07.00.00 Tarix fanlari
19.00.00 Psixologiya fanlari
01.00.00 Fizika-matematika fanlari
02.00.00 Kimyo fanlari
03.00.00 Biologiya fanlari
09.00.00 Falsafa fanlari
10.00.00 Filologiya fanlari
11.00.00 Geografiya fanlari

MAKTABGACHA VA MAKTAB TA'LIMI

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