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Section 1. Clinical Medicine

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THE EFFECTIVENESS OF LAPAROSCOPIC MANAGEMENT AND ITS OUTCOMES IN NON-PALPABLE INTRA-ABDOMINAL TESTIS: A RETROSPECTIVE STUDY FROM NORTHERN SAUDI ARABIA

Abstract. Cryptorchidism is one of the most commonly encountered genitourinary anomalies in male children. The reported prevalence of this condition is up to 3% in full term neonates and can go up to 30% in case of premature boys. The untreated undescended testis may result in several complications such as infertility and tumor. Further, the psychological stress of a lost testis for the patient, and the apprehension of parents are motivation that rationalize this kind of treatment. Of the all undescended testis, around 20% of testicles are non-palpable. For the management of the above problem can be alternatively managed by the laparoscopic technique. In our study we examined the diagnostic laparoscopy, assessed the findings and efficacy of laparoscopy in the diagnosis and surgical treatment of undescended testis.

Keywords: laparoscopic technique, diagnosis, surgical treatment, cryptorchidism, non-palpable testis.

Methodology:

The present study is a retrospective study done among children who had underwent laparoscopic management for undescended testes from different hospitals of Aljouf region of northern Saudi Arabia. A non – probability consecutive sampling method

was applied to select the patients to be included in this study. The total children recruited in the present research study was 90. Physical examination findings, reported investigation results, age at surgery, laparoscopic management and outcomes, surgical procedures findings, post-operation complications were assessed. Initial follow-up visits were carried out at 3rd month followed by 6-month periods for two years and then at annual frequency. Preoperatively, the patients were examined by two different urologists independently to confirm his diagnosis. Some of the patients has undergone ultrasound for location of testicles and results were negative. Also, a physical examination has been carried out in the operation room under anesthesia and the children with palpable testis were excluded from laparoscopic procedure and they have undergone an open orchiopexy.

Results:

Of the 90 children, a total of 37.8% (n = 34) presented with bilateral, whereas 62.2% (n = 56) had unilateral non-palpable cryptorchidism.

Table1. – The preoperative cryptorchidism status is described

Diagnosis	Unilateral Absence	Bilateral Absence
Absence	15	5
Canalicular	14	9
Intra-abdominal	27	20
Sub total	56	34

In the present study, we did not come across any intraoperative complications among all the surgery done. The children had mild postoperative pain and could be managed with analgesics.

During the follow up visits, there was no complication reported among the children such as infections, hernia and so on.

Conclusion:

The treatment of non-palpable testis is very important due to increased risk of complications, primarily malignancy and infertility. In spite of recommending the treatment of the undescended testis before two years of age, in certain countries, several patients were older, this is referred to the differences of the social and economic features of the public health system in those countries, the shortage of parental knowledge and lack of access to tertiary health care settings. Despite that fertility is already compromised in this age category, still there is a necessity of treating this medical condition, not only to avoid the risk of developing malignancy, but also to achieve a desired level of satisfaction and improve the level of quality of life for the patient and his family, and overcome the concerns of the family related to their child health.

Other non-invasive procedures for the diagnosis of non-palpable undescended testis such as ultrasonography, computed tomography and nuclear magnetic resonance are no considered as gold standard in intra-abdominal cases due to lack of sufficient sensitivity and specificity.

In recent decade, the MRI was offered with a high level of sensitivity (96%) and specificity (100%), but it remains a recent released technology, with high cost rates, and requires general anesthetic procedure in children. Hence we recommend to introduce The laparoscopy in peripheral hospitals and give the urologists there a good training to deal with like these cases.

Introduction:

Cryptorchidism is one of the most commonly encountered genitourinary anomalies in male children. The reported incidence of this condition is up to 3% in full term neonates and can go up to 30% in case of premature boys. During intrauterine period testicles together with peritoneum descend from abdominal cavity into scrotum via inguinal canal. [1] The testicles stuck through this immigration path for specific reason(s) (either related to hormones

or mechanics) are referred as undescended testis. Non-palpable testis is a subgroup of undescended testis which are not detectable through physical examination. The incidence rate of undescended testis is 1–3%. Non-palpable testes compromise 20 percent of undescended testicles. Non-palpable testes are located in the intra-abdominal cavity (about 20 to 25%) and inguinal canal (65%). Some of these testes atrophy during intrauterine period [1; 2]. The untreated undescended testis may result in several complications such as infertility and tumor [3]. Further, the psychological stress of a lost testis for the patient, and the apprehension of parents are motivation that rationalize this kind of treatment. Of the all undescended testis, around 20% of testicles are non-palpable. For the management of the above problem can be alternatively managed by the laparoscopic technique. In our study we examined the diagnostic laparoscopy and assessed the findings and efficacy of laparoscopy in diagnosing and surgically treating of the undescended testis.

Methodology:

The present study is a retrospective study done among children who had underwent laparoscopic management for undescended testes from different hospitals of Aljouf region of northern Saudi Arabia. A non – probability consecutive sampling method was applied to select the patients to be included in this study. The total children included in the present study was 90. Physical examination results, reported investigation results, age at surgery, laparoscopic management and findings, surgical procedures results, post-operation complications were evaluated. Initial follow-up visits were performed at 3rd month followed by 6-month intervals for the 2 year and then at yearly intervals. Preoperatively, the patients were examined by two different urologists independently to confirm his diagnosis. Some of the patients has undergone ultrasound for location of testicles and results were negative. Also, a physical examination was performed in the operating room under anesthesia and the children with palpable testis were excluded from laparoscopic procedure and they have undergone an open orchiopexy.

Results: Of the 90 children, 34(37.8%) presented with bilateral, while 56(62.2%) had unilateral non-palpable cryptorchidism.

Table 2. – The preoperative cryptorchidism status is described

Diagnosis	Unilateral Absence	Bilateral Absence
Absence	15	5
Canalicular	14	9
Intra-abdominal	27	20
Sub total	56	34

In the present study, we did not come across any intraoperative complications among all the surgery done. The children had mild postoperative pain and could be managed with analgesics.

During the follow up visits, there was no complication reported among the children such as infections, hernia and so on.

Discussion:

The current study reveals that managing of non-palpable testis laparoscopic orchiopexy is a safe, and efficient procedure. However, the conventional utilization of laparoscopy in diagnosis in the algorithm is not offering added contributions in the majority of the patients.

In cases with non-palpable testis, there was a detection of testicular tissue was one-third of the patients who went through diagnosis using laparoscopy, and/or inguinal exploration, and only 1/5 of the patient showed normal testicular appearance that were localized within intra-abdominal cavity (n = 1), and inguinal canal (n = 7). The result of the present study supports the perspective which is asserting that intra-

abdominal testes are more affected in a serious and severe pattern [4]. This indicates that patients attend to the healthcare centers at higher periods of age. Late referral to the advanced healthcare centers is reported to effect testes negatively [5].

In time intervals when the utilization of diagnosis by laparoscopy was not in circulation, in cases of non-palpable testis, inguinal exploration was carried out, and if it was not possible to detect testis, the surgeons proceed by exploring abdomen [7]. However currently, diagnostic laparoscopy is referred as the golden standard method. As a minimum invasive procedure with favored and desired cosmetic outcome, and benefits of less length of stay in the healthcare setting, and relatively lower pain are desired aspects of laparoscopic surgery. Despite that, laparoscopic surgery might cause undesired serious and unwanted complications such as major vessel, and organ injuries, subcutaneous emphysema, hypercarbia, gas embolism, cardiac arrhytmia, and arrest [8; 9].

Laparoscopic surgery has been described in literature as safe and fruitful procedure, and even superior over inguinal orchiopexy [10].

In recent years, the Magnetic Angioresonance was offered with a level of sensitivity that reaches up to 96% and specificity of 100%, but it remains costly and requires the performance of general anesthetic procedure for children [11].

In cases of intra-abdominal testicles, the precious benefit of laparoscopy is that, besides accurate diagnosis, it allows to handle the real-time therapy of the testes. In addition, in cases of associated inguinal hernia (particularly in cases with peeping testis), the laparoscopic procedure also allows to treat the hernia sac simultaneously with desired outcome [12].

Dissecting of the spermatic vessels carefully in addition to preserving the peri-deferential vessels are essential to assure testicular preservation.

Adopting laparoscopic procedures, the cosmetic side is significantly more desired as contrasted to open surgery, and the length of stay at hospital and convalescence are significantly shorter. In the pediatric age category, those factors might not provide clear evidence for the patient themselves, but surely will be for the parents, who are capable to early continue their daily life activities.

Conclusion:

The treatment of non-palpable testis is very important due to increased risk of complications, primarily malignancy and infertility. In spite of recommending the treatment of the undescended testis before two years of age, in certain countries, several patients were older, this is referred to the differences of the social and economic features of the public health system in those countries, the shortage of parental knowledge and lack of access to tertiary health care settings. Despite that fertility is already compromised in this age category, still there is a necessity of treating this medical condition, not only to avoid the risk of developing malignancy, but also to achieve a desired level of satisfaction and improve the level of quality of life for the patient and his family, and overcome the concerns of the family related to their child health.

Other non-invasive procedures for the diagnosis of non-palpable undescended testis such as ultrasonography, computed tomography and nuclear magnetic resonance are no considered as gold standard in intra-abdominal cases due to lack of sufficient sensitivity and specificity.

In recent years, the Magnetic Angioresonance was offered with a level of sensitivity that reaches up to 96% and specificity of 100%, but it remains costly and requires the performance of general anesthetic procedure for children. Hence we recommend to introduce The laparoscopy in peripheral hospitals and give the urologists there a good training to deal with like these cases.

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THE PREVALENCE AND STRUCTURE OF CONGENITAL ABNORMALITIES OF THE MAXILLOFACIAL AREA DEVELOPMENT

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Abstract. 414 case records of the patients with congenital cleft lip and palate have been retrospectively analyzed, which were treated in the period from 2014 to 2018 in the Maxillofacial Surgery Department (Dental Pediatric) of the Clinical Center of Maxillofacial, Plastic Surgery and Dentistry, FSBEI of HE of the A. I. Evdokimov Moscow State University of Medicine and Dentistry of the Ministry of Health of Russia.

Keywords: congenital abnormality, maxillofacial area, congenital cleft lip and palate.

Congenital maxillofacial abnormality in humans takes 4–7 place and makes up from 13% to 30% of all congenital abnormalities and is accompanied by anatomical and functional dentition disorders [1].

The abnormalities of cardiovascular system (50.8%) take the leading place in the structure of fetus congenital abnormalities (CAs), the second place take CAs of the GUS (13.8%), the third one take CAs of the LMS, musculoskeletal system abnormalities (11.5%), the fourth place take multiple congenital abnormalities (6.0%), the fifth place take CAs of the central nervous system (5.76%), the sixth one – cleft lip and palate (4.12%) [3].

Congenital abnormalities constitute a significant group in the structure of the maxillofacial area (MFA) surgical diseases in children. Among all types of congenital abnormalities, the frequency of birth of children with cleft upper lip and palate is the highest and varies in different regions of the Russian Federation from 1:500 to 1:1000 newborns. According to WHO, the average frequency of this abnormality in the world is 1:700 newborns [8].

According to EUROCAT, in the period from 2011 to 2017, the prevalence of cases of children birth with congenital cleft lip and palate per 10,000 births was: cleft lip with/without cleft palate – 7.83 and cleft palate – 5.64.

In Russia over the past 15 years an increase in the frequency of children birth with this abnormality, especially in industrially developed areas was noted [2].

In a retrospective study, an analysis of the congenital cleft lip and palate frequency and structure was made in patients who applied to the Department of Maxillofacial Surgery Department (Dental Pediatric)

of the Clinical Center of Maxillofacial, Plastic Surgery and Dentistry, FSBEI of HE of the A. I. Evdokimov Moscow State University of Medicine and Dentistry of the Ministry of Health of Russia in the period from 2014 to 2018, 414 case histories were processed.

The age of patients asking for help is from two months to one year (10.6%), from one year to five years (29.4%), from five to ten years (26.5%), from ten to fifteen years (22.3%), from fifteen to eighteen years (11.2%) (Fig. 1).

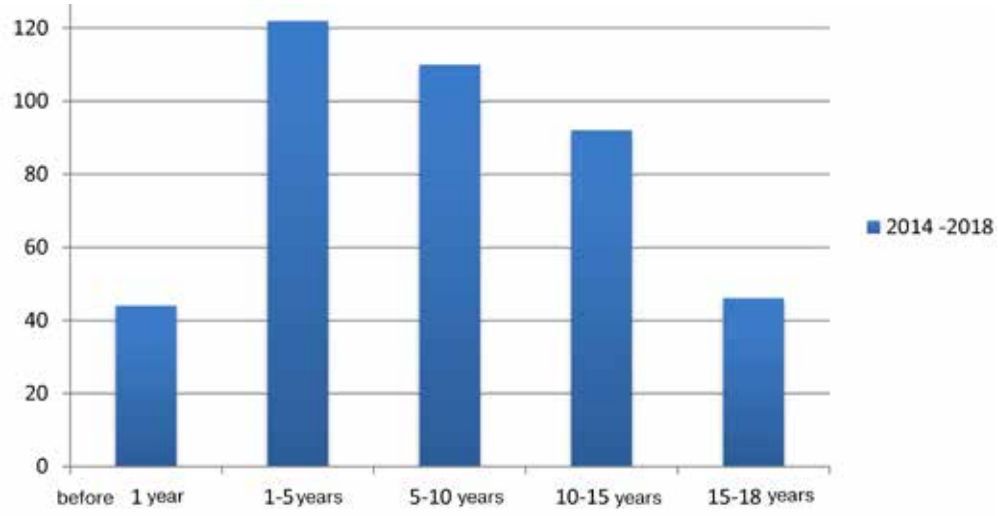

Figure 1. Age distribution of children with congenital cleft lip and palate

The low visiting of patients over the age of ten years is due to the successful surgical interventions and the beginning of a comprehensive rehabilitation concerning the congenital abnormality of maxillofacial area at an earlier date.

The patients treated during the period from 2014 to 2018 were diagnosed with the following forms of congenital abnormality of maxillofacial area: unilateral cleft hard palate and lip – 37.5%, ambilateral cleft hard palate and lip – 19.4%, ambilateral cleft lip – 10.2%, ambilateral cleft hard palate – 8.2%, cleft palate – 5.3%, unilateral cleft hard and soft palate – 7.3%, others – 12.1%.

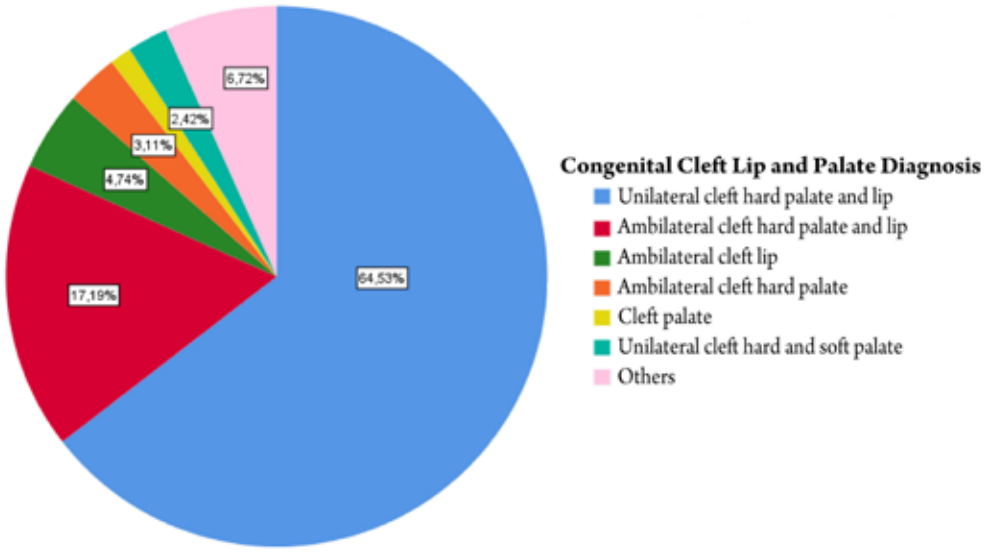

Figure 2. Circle-Amount – the Number of Patients at a pitch of Congenital Cleft Lip and Palate Diagnosis. Year: Total for the period from 2014 to 2018. Structure of visits a doctor by diagnosis

Annually, the maximum share of visits (64.53%) is due to unilateral cleft hard palate and lip (Fig. 2).

An analysis of the territorial subjects of the Russian Federation was made, of which most often the patients sought specialized medical advice, and the data are presented in (Fig. 3).

As a result of research and analysis of cases of children birth with congenital cleft lip and/or palate, it has been found that the frequency of this abnormality occurrence in different regions of the Russian Federation varies significantly. The congenital cleft lip and palate is most often diagnosed among newborns in the Smolensk region (9.17%), Ryazan Region (6.82%) and Moscow city (6.22%). In the Lipetsk, Orlov, Kursk, Vologda, Kemerovo, Kirov, Ivanovo, Kaluga, Yaroslavl, Kostroma, Voronezh, Novosibirsk, Tyumen, Vladimir, Murmansk, Volgograd Regions; the Republics of Dagestan, Karelia, Mordovia, Kalmykia, Crimea; the Krasnodar, Altai, Perm, Kamchatka territories, the frequency of this abnormality occurrence is from 1 to 4%.

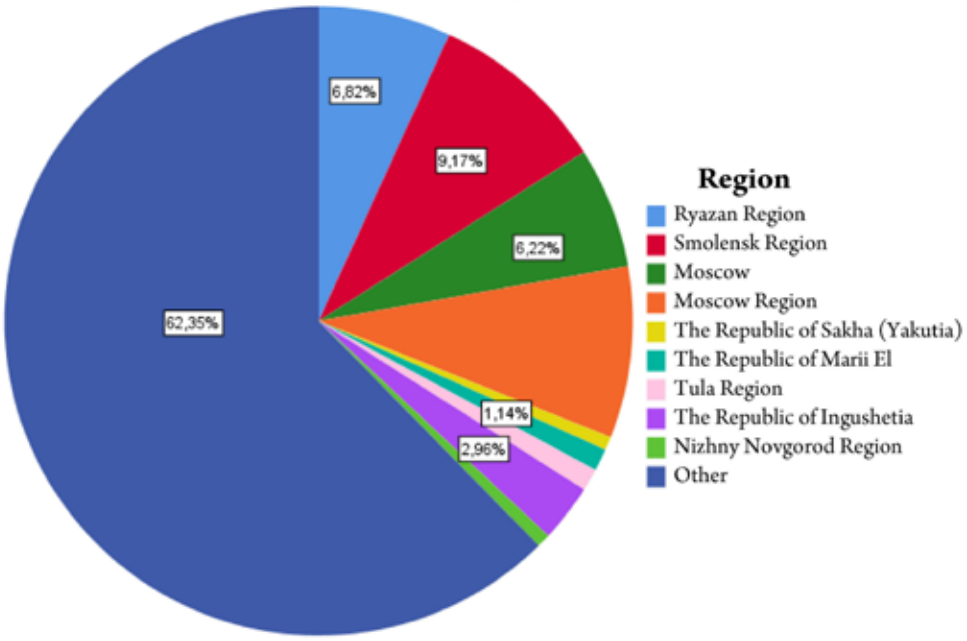

Figure 3. Circle-Amount – the Number of Patients at a pitch of Region. Year: Total for the period from 2014 to 2018. Structure of visits a doctor by region

The greatest prevalence of congenital abnormalities of maxillofacial area has been established in Smolensk Region, which is associated with geographical proximity and radiation exposure due to nuclear tests at the Semipalatinsk test site [6].

This abnormality causes a complicated complex of anatomical and functional disorders in the children's body.

Difficulties in restoring the disturbed vital functions of nutrition, breathing and speech, anatomic restoration of the upper lip and the nose and upper jaw when the body grows, is the cause of disability of children with cleft lip and palate for years to come [7].

According to the latest statistical data, the tendency towards an increase in the number of children with such abnormalities still remains unchanged, and amounts to one child per 800–1000 born children. Cleft lip and palate can also be accompanied by other congenital abnormalities and be part of hereditary syndromes [5].

A newborn with cleft lip and palate at first has eating disorder. The functions of sucking, swallowing and breathing disorder leads to difficulty in feeding the baby. That creates the basis for diseases development, which may be the cause of child death in the first days of life.

Congenital abnormalities of a person are relevant medical and social problems, which is associated with severe impaired functional activity of various organs and systems of the body, as well as the difficulty of patients' adaptation in society [4].

Early diagnosis, surgical treatment and timely organized complex rehabilitation of children with this pathology contribute to the restoration of maxillofacial area functioning and early social adaptation in society, as well as the quality of life of patients with congenital cleft lip and palate improvement.

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Section 2. Medical bioscience

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METABOLIC AND GENETICAL FEATURES OF BIODEGRADATION AND RESISTANCE POTENTIAL OF SOIL *PSEUDOMONAS SP.* FROM THE NATIONAL CULTURE COLLECTION OF MICROORGANISMS, REPUBLIC OF ARMENIA

Abstract: *Pseudomonas* are represented in nature by versatile Gram-negative aerobic bacteria, which are very common for various wet surfaces (soil, water, medical non-sterile solutions, etc.) and are able to survive in temperatures and pH large scale. They are well-known by the ability to synthesize huge quantity of different enzymes, toxins and antibiotic-like substances. The majority of *Pseudomonas* have a wide spectrum of resistance. The research of multidrug resistant pathogenic and opportunistic pathogenic carry especial medical and ecological importance, as well as the model research of resistance mechanism on their non-pathogenic non-toxigenic analogues. Besides, *Pseudomonas* are very interesting because of their ability to biodegradation of various chemical compounds, including synthetic xenobiotics. Thus, the main aim of current research was the study of some soil strains of *Pseudomonas* in aspects of their genetic and metabolic features of resistance and xenobiotics biodegradation potential.

Keywords: *Pseudomonas*, multidrug resistance, biodegradation, plasmid stability.

Introduction

Pseudomonas are very common inhabitants of wet surfaces world around. The classification features of *Pseudomonas* were changed many times and according to the last research, the genus belonging to the family *Pseudomonadaceae* and containing 191 validly described species [1]. More than 25 species are associated with human organism. The majority of these Gram-negative aerobic bacteria are known by their ability to cause opportunistic diseases (*P. aeruginosa, P. putida, P. fluorescens*) in human and animal organism while the immunosuppressed conditions (AIDS, oncological diseases, post-operative wounds healing period of patients, etc.) [2; 3; 4; 5]. Besides there are the range of phytopathogenic (*P. syringae*) species and pathogens of fungi, as well as soil non-pathogenic strains (*P. chlororaphis*) [5; 6; 7; 8; 9]. *Pseudomonas* have a very variable genome and metabolism, what causes the high level of adaptive mechanisms. They have a different mobile genetical elements (plasmids, transposons), which are able to transfer their properties of resistance and biodegradation. As saprotrophic organisms *Pseudomonas* are being involved in a huge quantity of consumption chains as reducers. Thus, they can transfer their genes among the various Gram-negative bacteria, with the forming of new resistant strains. And it takes place as in native environment, as well is clinics, with the forming of new resistant pathogens, which can become a cause of hospital infections with compatible complications while the classical antibiotic therapy of diseases treatment [10; 11; 12; 13]. But the initial source of bacterial resistance to antimicrobial agents is always native environment. After the contact with antibiotics, the bacteria only are being selected under the pressing of antibiotic presence factor using an appropriate mechanisms of adaptation [14; 15]. That is why the research of soil *Pseudomonas* physiology, biochemical and genetical mechanisms of resistance to antibiotics is very important. Besides it is very actual for understanding the causes of stability of antibiotic resistance properties, even after the long time artificial cultivation of native strains on nutrient agar without any contact with native or synthetic antimicrobial compounds.

The main aim of current research was the study of 20 strains of soil *Pseudomonas* sp, after the long time cultivation on nutrient agar in Microbe Depository Center (MDC) of Republic of Armenia (RA), in aspects of their genetic and metabolic features of biodegradation potential and antibiotic resistance, as well as for further taxonomic definition of them.

Materials and methods

During the research there were used the strains from The National Culture Collection of Microorganisms, MDC, "Armbiotechnology" SPC NAS RA. 20 soil strains of *Pseudomonas sp.* were cultivated at 30–37 °C on solid and liquid nutrient cultural media and then were tested by the standard protocols of antibiotic resistance. There were used 50 mkg/ml concentrations of 13 antibiotics of different classes and generations: β – lactams – penicillin (Pen), ampicillin (Amp), amoxicillin (Amx) and the combined with inhibitor of β – lactamases – clavulanic acid – augmentin (Amc) of aminopenicillins, as well as cefixime (Cfm), ceftriaxone (Cro) from cephalosporins; aminoglycosides – kanamycin (Kan), streptomycin (Str), gentamycin (Gen); fluoroquinolone – ciprofloxacin (Cip); tetracycline (Tet); Chloramphenicol Chl) of amphenicoles, azithromycin (Azm) – of azalide macrolides [16; 17; 18; 19].

The enzyme activity precipitation was done according to standard microbiology and biochemistry protocols on solid cultural media using the different substrates. For caseinase activity it was used the milk casein destruction test [20; 21]. For polyphenol oxidase precipitation there were used *L* – tyrosine (for *o* – diphenol oxidase or tyrosinase), α-naphthol and tannin (for *p* – diphenol oxidase or laccase) [22; 23; 24]. For the precipitation of biodegradation lipase activity as the substrates were used polysorbates 20, 40, 60, 65, 80, 85 [25; 26; 27]. The genetical analysis was done by DNA electrophoresis on 0.8–2.5% agarose gel, transformation by Mandel's

method and PCR. DNA isolation was done by alkaline extraction for plasmids and with benzyl-chloride method for total DNA. PCR analysis was done with the following primers: *aph(3')*IV (for aminoglycoside – O – Phosphotransferase), *aac(6')II* (for aminoglycoside-N-Acetyltransferase), *pCAT639* (for chloramphenicol acetyltransferase, encoded by catB7 gene), *blaOXA-10* (for *β* – lactamase OXA-10) and marker standard fragment mix EcoRI/Hind III [28; 29; 30].

Results

The results of all the carried out experiments are presented in (tables 1–4). According to data from table 1, the tests showed the wide diversity of antibiotic resistance. The prevalence of resistant strains quantity is notable. Among the observed *Pseudomonas sp.*, the resistance to β-lactams was detected in a majority of strains, while the aminoglycosides resistance was detected only in 35% of bacteria. Thus, from all the researched bacteria, 10% – Kan-resistance, 25% -Stp-resistance and 30% – Gen – resistance was detected and 25% of strains were multidrug resistant. In some strains it was detected the prolongation of growth and late growth after II and III days of cultivation. Besides, in case of strain *Pseudomonas sp. 9317*, it was noted the forming of singular colonies which were resistant to kanamycin. Probably they are the mutant forms of initial pure culture of the researched strain, which is sensitive to antibiotic.

For the evaluation of the resistance spread potential risks, plasmid and total DNA were isolated, and analyzed by agarose gel electrophoresis

Table 1. – Antibiotic Resistance of *Pseudomonas sp*. of soil ("+" – growth, "–" -the absence of growth, "–***" – late growth of singular colonies after IV day of cultivation, "+*" – late growth zone after II day of cultivation, "+**" – late growth zone after III day of cultivation, C – control on nutrient agar cultural media)

Strain	Kan	Str	Gen	Chl	Amc	Amx	Amp	Pen	Cfm	Cro	Tet	Azm	Cip	C
9312	–	–	–	–	–	–	–	–	–	–	+	–	–	+
9333	–	–	–	–	–	–	–	–	–	–	+	–	–	+
9319	+	–	+	–	–	–	+	+	–	–	–	–	–	+
9331	–	–	+**	+**	–	+	+	+	–	–	+	–	–	+
9270	–	+	+**	–	–	–	+	+*	–	–	–	–	–	+
9328	+	–	–	+	+	+	+	+**	+	–	–	–	–	+
9322	–	+	+*	–	–	–	+	+	–	+	–	–	+	+
9321	–	+	–	–	–	–	–	–	+	+	+	+	+	+
9324	–	–	–	–	–	+	+	+	–	–	+	–	–	+
9323	–	–	–	+	+	+	+	+	+	–	–	–	–	+
9320	–	–	–	–	–	–	+	+	+	–	–	–	–	+
9318	–	+	+**	–	+	+	+	+*	–	–	–	–	–	+
9325	–	–	–	–	–	–	–	–	–	+	–	–	–	+
9257	–	–	–	–	+	+	+	+	+	–	–	–	–	+
9327	–	–	+*	+*	+	+	+	+	–	–	–	–	–	+
9267	–	–	–	–	–	–	–	–	–	–	–	–	–	+
9269	–	–	–	–	–	–	–	–	–	–	–	+	–	+
9311	–	–	–	+	–	–	+	+	+	–	+	–	+	+
9317	–***	–	–	+	–	+	+	+	–	–	+	–	–	+
9313	–	+	–	–	–	+	+	+	–	–	–	–	–	+

As a result of DNA analysis, the plasmids were identified in strains *Pseudomonas sp. 9321, 9333, 9319, 9324, 9311, 9113, 9331, 9323, 9320, 9312, 9267* and *9317*. For the understanding of resistance mechanism

there were done PCR and transformation series. During the PCR analysis of antibiotic modification enzymes genes *aph(3')IV, aac(6')II, pCAT639/catB7, blaOXA-10* the presence of, *blaOXA-10* (1,6 kDa) gene was detected in *Pseudomonas sp. 9311*. The transformation showed that the detected β –lactamase OXA-10 gene have plasmid localization and able to transfer to other Gram-negative bacteria. During the repeating cultivation of transformed strains on nutrient agar and then on a selective cultural media with antibiotics, it was shown the stabile replication of plasmids in antibiotic sensitive recipient *P. aeruginosa 9056,* while in case of sensitive recipient *E. coli DH5α,* the stability was not detected. Probably it is caused by the features of *Pseudomonas* genome, what is being described in literature [31; 32]. Then some experiments with biodegradation enzyme presence were carried out. The main aim of them was to compare the bacteria in aspects of key enzymes of infection of toxigenic pathogenic and opportunistic pathogenic strains of *Pseudomonas* (collagenases, caseinase, etc.) with their plasmid content and resistance. Besides the various polysorbates biodegradation activity of their lipases was tested. As it is shown, on a table 3, the majority of researched *Pseudomonas* are able to grow using polysorbates as the carbon source, but the activity is notable only for 4 non-plasmid strains – *Pseudomonas sp. 9257, 9318, 9262, 9269*.

Table 2. – Lipase activity of soil *Pseudomonas sp.* ("+" – the identification of growth (precipitation zone diameter in mm) or activity (since singular colonies up to intensive growth zone forming); C^+ – the positive control on nutrient agar media, C^- – the negative control on mineral agar media, without carbon source)

Strain	P20		P40		P65		P60		P80		P85		C^-	C^+
	G	A	G	A	G	A	G	A	G	A	G	A		
9312	3+	–	3+	–	3+	–	2+	–	3+	–	3+	–	–	5+
9317	3+	–	3+	–	3+	–	+	–	3+	–	3+	–	–	5+
9318	3+	–	2+	–	3+	–	+	–	3+	–	3+	2+	–	5+
9313	3+	–	+	–	+	–	2+	–	+	–	+	–	–	5+
9311	+	–	+	–	–	–	+	–	+	–	–	–	–	5+
9319	3+	–	3+	–	3+	–	+	–	3+	–	3+	–	–	5+
9257	3+	5+	+	–	+	–	+	–	2+	–	2+	–	–	5+
9320	2+	–	3+	–	3+	–	2+	–	3+	–	3+	–	–	5+
9321	3+	–	3+	–	3+	–	2+	–	3+	–	3+	–	–	5+
9322	3+	–	3+	–	3+	–	2+	–	2+	–	3+	–	–	5+
9323	3+	–	3+	–	3+	–	2+	–	2+	–	3+	–	–	5+
9267	+	–	+	–	+	–	+	–	+	–	+	–	–	5+
9324	2+	–	3+	–	3+	–	3+	–	2+	–	3+	–	–	5+
9325	3+	–	–	–	3+	–	3+	–	3+	–	3+	–	–	5+
9327	+	–	3+	–	3+	–	2+	–	3+	–	3+	–	–	5+
9328	3+	–	3+	–	3+	–	2+	–	3+	–	3+	–	–	5+
9262	2+	+	2+	–	+	–	+	–	2+	–	+	+	–	5+
9331	+	–	3+	–	3+	–	2+	–	2+	–	3+	–	–	5+
9269	+	–	+	–	+	–	+	–	+	–	+	+	–	5+
9333	3+	–	3+	–	3+	–	3+	–	3+	–	3+	–	–	5+

During the research of polyphenol oxidases, the activity of *L* – tyrosine degradation (tyrosinase) was detected in 50% of observed strains, while practically all strains were able to grow on cultural media, containing *L* – tyrosine (*L* – Tyr), tannin and α-naphtol as carbon source. In

strains *Pseudomonas sp. 9328, 9320, 9321, 9318* the growth was intensive but lower than in control samples, but they demonstrated the maximal level of enzyme activity.

Table 3. – Polyphenol oxidase activity of soil *Pseudomonas sp.* (G –growth, A – activity, "+" – the growth (precipitation zone diameter in mm) or activity (since singular colonies up to intensive growth zone); C^+ – the positive control on nutrient agar media, C^- – the negative control on mineral media without carbon source)

Strain	α–naphtol		L–Tyr		Tannin		C^-	C^+	Strain	α–naphtol		L–Tyr		Tannin		C^-	C^+
	G	A	G	A	G	A				G	A	G	A	G	A		
9324	3+	–	3+	3+	–	–	–	5+	*9331*	+	–	2+	3+	–	–	–	5+
9325	2+	–	4+	–	+	–	–	5+	*9319*	2+	–	3+	3+	–	–	–	5+
9323	+	–	3+	–	–	–	–	5+	*9327*	+	–	3+	3+	–	–	–	5+
9333	+	–	3+	3+	+	–	–	5+	*9312*	+	–	3+	3+	+	–	–	5+
9322	2+	–	++	3+	–	–	–	5+	*9328*	2+	–	3+	5+	–	–	–	5+
9317	–	–	3+	–	+	–	–	5+	*9321*	2+	–	3+	5+	–	–	–	5+
9320	2+	–	3+	5+	–	–	–	5+	*9318*	2+	–	3+	5+	–	–	–	5+

While the tests of caseinase activity, it was detected in 55% of observed strains (table 4).

Table 4. – Caseinase activity of Pseudomonas sp., isolated from soil. (G –growth, A – activity, "+" – the growth (precipitation zone diameter in mm) or activity (since singular colonies up to intensive growth zone); C^+ – the positive control on nutrient agar media, C^- – the negative control on mineral media, without carbon source)

Strains	Day 1		Day 5		C^+	C^-	Strains	Day 1		Day 5		C^+	C^-
	G	A	G	A				G	A	G	A		
9257	–	–	–	–	3+	–	*9312*	–	–	2+	–	3+	–
9262	–	–	2+	–	3+	–	*9313*	–	–	3+	8+	3+	–
9331	–	–	3+	12+	3+	–	*9317*	–	–	2+	–	3+	–
9267	–	–	–	–	3+	–	*9319*	–	–	2+	7+	3+	–
9269	–	–	2+	–	3+	–	*9320*	1+	2+	3+	8+	3+	–
9270	–	–	2+	7+	3+	–	*9321*	–	–	–	–	3+	–
9318	–	–	2+	1+	3+	–	*9322*	–	–	–	–	3+	–
9327	–	–	3+	12+	3+	–	*9323*	–	–	2+	–	3+	–
9328	2+	2+	3+	8+	3+	–	*9324*	–	–	3+	6+	3+	–
9333	–	–	2+	–	3+	–	*9325*	–	–	3+	–	3+	–

It was detected in *Pseudomonas sp.: 9313, 9318, 9319, 9320, 9324, 9327, 9328, 9331, 9270,* from which the plasmid containing were *Pseudomonas sp. 9319, 9320, 9331, 9313 a*nd it is important because key role of proteolytic activity in *Pseudomonas* infection pathogenesis.

Conclusion

Among the all newly observed soil strains of *Pseudomonas sp.,* it was discovered the wide diversity resistance. It was detected the resistance to more than one antibiotics of large spectrum, pundrug and multidrug resistance. The possibility to participate in resistance spread by intraspecific the gene horizontal transfer among the various Gram-negative bacteria was shown for one strain. Besides, it was discovered the stability of resistance of all the researched strains. The plasmids, which were identified as Amp, Pen, Cfm-resistance car-

riers in *Pseudomonas sp. 9311,* are able to stabile replication in *P. aeruginosa 9056* even after the long-time cultivation on non-selective media. The enzyme presence analysis showed the diversity of lipases, tyrosinase and caseinase presence. The tests showed the correlation absence between the plasmid stability and enzymes presence, because of their nucleoid localization. According to all the collected data, nevertheless the fact that in all the researched strains there were detected enzymes of xenobiotic degradation significant activity, the growth on a media with consistence of various xenobiotics of different chemical structure was detected practically in all bacteria. In some strains, the growth on xenobiotic containing media was not less intensive than on nutrient agar cultural media. The resistance genetics and enzyme research next steps are very important for further taxonomic definition of these researched strains *Pseudomonas sp.,* isolated from soil.

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COMBINED PROSTHESES ON TELESCOPIC CROWNS

Abstract. The article considers a clinical case of using telescopic structures in orthopedic dentistry. The stages of manufacturing and the feasibility of using this type of prosthetics are shown.

Keywords: Orthopedic dentistry, telescopic crowns, removable dentures, dental practice.

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КОМБИНИРОВАННЫЕ ПРОТЕЗЫ НА ТЕЛЕСКОПИЧЕСКИХ КОРОНКАХ

Аннотация. В статье, рассмотрен клинический случай применения в ортопедической стоматологии, телескопических конструкций. Показаны этапы изготовления и целесообразность применения данного вида протезирования.

Ключевые слова: Ортопедическая стоматология, телескопические коронки, съёмные протезы, зубопротезная практика.

Современная ортопедическая стоматология даёт большие возможности по восстановлению функциональных особенностей зубо-челюстной системы и эстетических приоритетов каждого пациента [1].

Цифровые и биосовместимые технологии позволяют добиться врачу-стоматологу полной схожести искусственных коронок (протезов) с природными зубами и отличить их не профессионалу практически не возможно.

Большой выбор ортопедических конструкций, позволяет сегодняшнему пациенту подобрать для себя наиболее приемлемый в финансовом отношении вариант протезирования.

Нам хотелось бы рассмотреть в данной статье клинический случай съёмного протезирования на телескопических коронках.

Данная конструкция применяется в зубопротезной практике при множественном отсутствии естественных зубов, и при не возможности по показаниям установить имплантаты [1–2]. Телескопические системы имеют цилиндрические и конусные формы. В нашем случае, мы использовали конусную форму, так как она более проста в ис-

пользовании и не вызывает проблем при снятии и фиксации протеза.

На первом снимке мы видим изготовленные и фиксированные на опорных зубах цельнолитые металлические колпачки (нижняя челюсть, вид сверху).

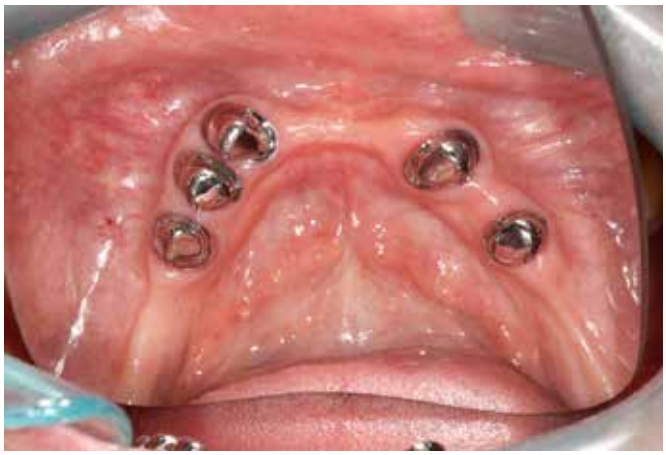

Рисунок 1.

Рисунок 2. Нижняя челюсть, вид спереди

Данная работа проводилась в несколько этапов. Зубы под опорные колпачки были депульпированы (что является отрицательным фактором данной конструкции), потом следовала обработка зубов (препарирование) и снятие двухслойного оттиска с нижней челюсти для передачи максимально точных особенностей препарированных зубов.

Далее полученный слепок передавались в зуботехническую лабораторию, где по полученной модели изготавливались цельнолитые конструкции.

По факту их готовности, они были фиксированы в полости рта на стеклоиномерный цемент. В дальнейшем, повторно снимались двухслойные слепки под изготовление верней части протеза.

Рисунок 3.

Рисунок 4.

Рисунок 5.

На второй фотографии мы видим уже полностью изготовленный протез на верхнюю челюсть.

На третьей и четвёртой фотографиях, можно увидеть нижний протез, с фиксированной в пластмассе съёмной частью телескопической коронки.

И на пятом снимке, мы видим полностью изготовленные конструкции в полости рта.

Данный вид конструкции, как говорилось выше, может использоваться при прямых противопоказания к имплантации. Хотя тоже имеет ряд недостатков: обточка и депульпирование опорных зубов, длительный период изготовления, убыль костной ткани на участках отсутствующих зубов и соответственно уход за съёмными протезами [2].

К положительным качествам данного вида протезирования можно отнести: эстетичность (конструкция практически незаметна для окружающих), быстрое привыкание, стабильная фиксация в полости рта [1].

Телескопические конструкции используются в практике стоматологов с 1929 года, постоянно совершенствуясь, но не теряя свою актуальность.

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Section 3. General biology

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GOLDEN COLOR CATS – HYPOTHESES, RESEARCHES AND EVIDENCE

Abstract. The authors conducted a study on the differentiation of gold colors of cats and proposed an author's vision of the genetic justification for the emergence of new variations of gold colors. As a result of the study, the author's classification of the golden colors of cats is proposed.

Keywords: color of cats, golden color, differentiation of golden colors of cats.

Formulation of the problem. In felinology, the standards of breeds and colors of cats are fundamental for the examination of their quality according to phenotypic characteristics. However, standards are a "law" within each of the hundreds of world felinological systems and do not have to be the same standard for another. Sometimes, even the breed of the same cat can be called differently. For example, the Siberian colorpoint color is the Neva Masquerade in another system. It is even more difficult to define uniform standards for colors, because perception subjectivity has been added to their description, both when describing standards and when evaluating a cat in accordance with standards.

Not to mention the identity of translations from various languages of such subtle concepts as color (for example, "blue", "saturated blue", "blue", "aquamarine" eye color).

In this article, we tried to systematize the observations of phenotypes and their development in cats of several breeds, which felinologists identify as Golden or Brown (brown) agouti; analyzed a number of scientific articles on the topic of pigmentation in thoroughbred domestic cats, dogs, mice and some other mammals.

The task is to formalize the hypotheses of expert felinologists on the genetics of gold cats in all manifestations. Such hypotheses, with their justifications, can enable genetic laboratories to carry out appropriate studies of various gene mutations at the Agouti, Color, Extension, and other loci in order to define "golden" colors and differentiate them from other "similar" ones – Brown and Amber -agouti.

In the upper row are photographs of animals identified as Brown-tabby, and in the lower row as Golden-tabby.

The color of a cat, as it were not called, is based primarily on the presence of pigment in the coat and skin. (Cases of the absence / blocking of the pigment, i.e. pinto spots and white colors, are not considered in this article). The color of mammals, including cats, is provided by two types of black / brown pigments – eumelanins and red / yellow – pheomelanins in the entire gamut of these colors [1].

Figure 1. Phenotypic variation in the distribution of eu and pheomelanin in cat hair

Note: the names of the breeds and colors of cats in the article begin with a capital letter to avoid confusion.

Figure 2. Gamma of colors of eumelanin and pheomelanin

Melanins are synthesized in pigment cells – melanocytes. Eumelanin can be observed on the skin and mucous membranes of the cat, the iris, and both types of melanin (eu and pheomelanin) are found in the hair of a cat.

1. Overview of color-forming genes in cats.

- Gene E (Extension) is responsible for the synthesis of eumelanin, giving or not giving a command to produce eumelanin. In homozygotes, its eumelanin simply does not form. Thus, it turns out – red (or yellow) color – of all possible pigments, only pheomelanin is produced. Important Note: The red (red) color in a cat is determined by the X (chromosome) -dependent O gene;
- The dominant allele E provides a complete team for the synthesis of eumelanin. It works directly under the control of the pituitary hormone, the melanocyte-stimulating pituitary hormone MSH. Therefore, gene E is also called the receptor for melanocyte-stimulating hormone (Mc1r);
- Gene T (Tabby) is responsible for the distribution of black / brown pigment (not for its production!) Over the body of the cat – on the coat and skin [1];
- Gene B provides the eumelanin packaging form. B (black) = tyrosinase related protein 1 (TYRP1). The dominant allele of this locus is responsible for packing into oblong granules with black pigment, and bb homozygotes pack eumelanin into spherical granules, and we see the color of the cat's coat and skin in chocolate color. The order of dominance is B> b> bl (bl is cinnamon, another allele at locus

B). Gene D (dilute) – gene for clarification (dilution), D – without clarification d – clarification to gray (blue);

- Agouti acts through agouti signal peptide (ASIP), an agouti signal protein. The product of the dominant allele (A) of the Agouti gene is a protein that acts as an MSH antagonist.

He himself binds to melanocortin receptors and thus blocks them. As a result, the synthesis of eumelanin is interrupted and an exclusively red / yellow pigment (pheomelanin) is formed. The expression of the agouti gene is not constant, but periodic, with an interval of several days, due to which bands of black and yellow pigments are formed on the growing hair.

2. Hypotheses on the genetics of Golden (or Golden) cats.

Historically, the assumptions about the Eraser (eumelanin inhibitor) and Wide-band (wide band) genes turned out to be unsuccessful – there are no concrete data on the mechanism and material existence.

For various reasons, the genetics of Golden colors has been better studied in other species of mammals – in mice, dogs, pigs, etc., than in cats. In addition, it can be argued that they are homologous in a number of gene complexes, including Agouti, Extension (MC1R), Color (TYRP).

The grounds for the formation of hypotheses in this article.

Golden colors, their identification and differentiation with Brown-tabby colors, are built

– on the analysis of phenotypes examined several hundred cats from various regions of Russia, Belarus, Germany, Israel, China, Ukraine;

– on a comprehensive statistical analysis of 1270 pedigrees of cats of various breeds, including the assessment of the reliability of the information in them;

– on the exchange of experience between cat breeders of Golden and Amber (Karnelian) cats, including oral and written interviews, a series of webinars and seminars organized by the authors of this article;

– on the analysis of information on the studied literature [1; 2; 3; 4].

We organized the collection of buccal epithelium in 44 cats for testing in the genetic laboratory for confirmation and / or correction of the hypotheses put forward. Hypothesis 1. The Agouti gene of cats is traditionally regarded as a simple locus with two allelomorphs. The Apb mutation (Agouti of Asian leopard cats) or the Charcoal color for the Bengal cat are currently also known. However, for other well-studied mammalian species (mouse, dog), a large number of alleles in the agouti locus, or, more precisely, the complex, are shown. We can assume a significant contribution of mutations in the agouti complex to the generation of new color variations in cats. In particular, Ay. The assumed dominance order is Ay> A> Apb> aa. The result of Ay is the shortening of the blackened areas of the hair in comparison, for example, with the result of the action of A (black pigment here means any eumelanin). The coal color of the Asian leopard cat (Bengal), characterized by an even weaker Apb allele, and homozygous aa will produce a completely blackened color.

Hypothesis 2.

The Extension gene, which is responsible for the synthesis of eumelanin, has several mutations. In particular, the recessive allele ey (later we will consider the ec mutation).

All possible combinations of non-homologous genes can give a full variety of Golden and Brown-Agouti colors of cats.

Its homozygote is epistatic with respect to any alleles B, T (tabby) and A (agouti). The reason is simple: it does not allow eumelanin to be produced, which means there is nothing to pack into granules (B), distribute it over the body (T) or over the hair (A).

When ey/* and Ay are present in the cat genotype, we will see a completely Golden color with a small

amount of black pigment in the hair, sometimes invisible to the eye.

These and other combinations of the genes in question and their alleles are shown in (Figure 3).

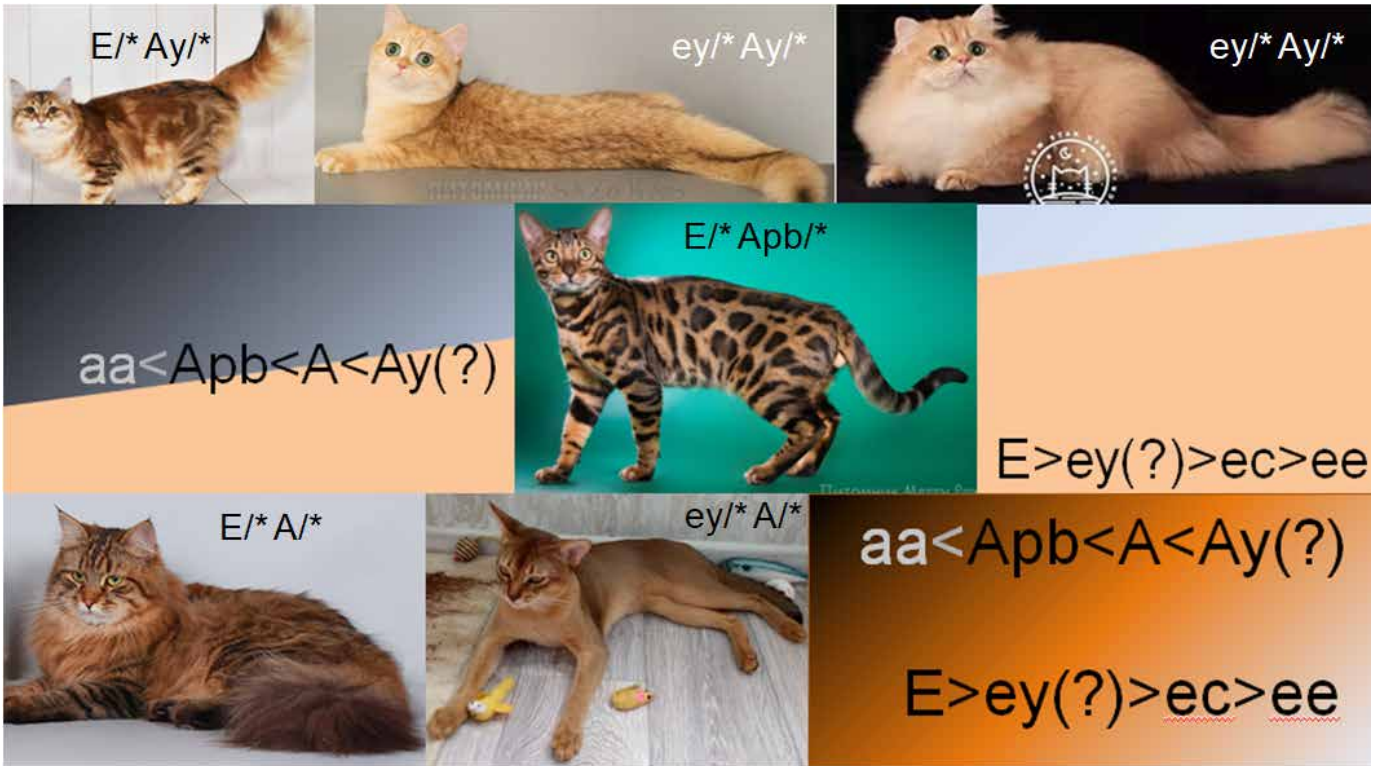

Figure 3. Estimated genotypes of Golden and Brown-Agouti cats

Considering the work of Alpha-MSH, it should be noted that it stimulates the synthesis and secretion of melanins (melanogenesis) by melanocyte cells not only in the skin, but also in the pigment layer of the retina. In this regard, for a long time it was believed that it was possible to differentiate Golden and Brown-agouti cats by eye color: with green – Golden, with yellow or yellow-green – Brown-agouti.

However, cats of colorpoint (Siamese) color, in which signs of "Gold" are noticeable, began to appear more and more often.

The breeds of such cats are very diverse – Neva Masquerade cats, British Shorthair and Longhair, Highland and Scottish folds and straight and a number of other breeds. All of them have blue, blue, aquamarine eye color. Therefore, it is necessary to define the Golden colorpoint color. Work in this direction is and will be carried out in the future. Amber, Carnelian (carnelian) color.

In the 1990s, European breeders of Norwegian Forest cats began to receive kittens with an unknown color similar to Reds: the hair was devoid of black pigment, while the pads of the paws remained dark brown. In addition, neither animals nor descendants of these animals could be Red (that is, transmission of the X-dependent O gene, Orange, was excluded).

Later, in the early 2000 s, the same «strange» cats were found in the herd of Kurilian Bobtail, born of a pair of Golden. Currently, the ZooGen Center for Veterinary Genetics has studied the MC1R protein [5], identified the ec allele and called it the "Carnelian of the Kuril Bobtail (carnelian)"

The proven existence and description of such an allele fits into the logic and indirectly confirms our hypotheses, along with parallelism with the genetics of dogs and some other mammals [2].

The dominance order of the ey> ec alleles is currently not established. It is only known that a

kitten of the Carnelian color can be born from two Golden animals, and Golden kittens are not born from a pair of Carnelian-color Golden Kittens. In this case, as a rule, Golden-agouti animals look more yellow than Cornelian-agouti.

Figure 3. Different expression of the shades of pheomelanin

In this regard, we put forward Hypothesis 3 – the differentiation of Brown (brown / black), Golden and Carnelian (carnelian, amber) colors is contained in the work not only of the allele from the Extension (MC1R) gene, but, at least, also in combination with alleles Agouti gene (ASIP).

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Photos of cats are provided to the authors of this article by their owners for statistical analysis and publication in scientific journals on the basis of the designation of the owner's cattery name.

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NEGATIVE EFFECT OF BREAKFAST SKIPPING – FINDINGS AMONG ADOLESCENTS OF THE UNITED STATES

Abstract.

Objective: This study aims to examine the negative effect of skipping breakfast on body weight status and academic performance among adolescents.

Methods: Data from the Youth Risk Behavior Surveillance System (YRBSS) 2017 was used. Logistic regression analysis is used to examine the effect of skipping breakfast on body weight status and academic performance.

Results: 14% percentage of high school students reported skipping breakfast.

skipping breakfast is associated with 1.35 times higher likelihood of being overweight or obese, compared with those who do not skip breakfast.

It is associated with 1.44 times higher likelihood of poorer academic performance.

Conclusion:

A large percentage of high school students skip breakfast. Skipping breakfast is negatively associated with weight status and academic performance.

Keywords: Logistic regression analysis; breakfast skipping.

1. Introduction

A wind vane of the modern fashion style is quite interesting-people pays more attention to their shapes, especially for teenage girls who are eager to dress in attractive outfits to expose enviable body features. According to the rough estimation, there are nearly half of high school students feeling a great deal of stress in the United States. How could adolescence work out for perfect body shape in such an academic press? Skipping meals is a good hypothesis. Interestingly, a majority of young people chooses to skip breakfast or eat "brunch". Breakfast, as known as the most important meal in daily life, helps start metabolism, burn calories throughout the day, and provide the energy after 9-hours of sleep. It is obvious that the breakfast has more positive effects, even help lose weight, and provides less fat as lunch does. People will not let their stomachs scream for no reason. The curiosity of mystery impulses scientists to convey. One more reasonable hypothesis is the connection with modern youths' biological clock. Regardless, the increasing of skipping breakfast rate in teenagers is actually a potential risk for the American's future. The following paper will introduce and explain the main reason and effect of this interesting social phenomenon.

In this study, we aimed to examine the negative effect of skipping breakfast on body weight status and academic performance among adolescents, using data of a nationally representative sample from the Youth Risk Behavior Surveillance System (YRBSS).

2. Research Methods

2.1 Data source

The YRBSS was developed in 1990 by the Centers for Disease Control and Prevention (CDC),

aiming to monitor health-related behaviors that contribute to deaths and disabilities among youth and adults. It includes national, state, territorial, tribal government, and local school-based surveys of representative samples of students in 9th through 12th grade. These surveys are conducted every two years.

YRBSS monitors six categories of health-related behaviors:

Behaviors that contribute to unintentional injuries and violence;

- Sexual behaviors related to unintended pregnancy and sexually transmitted diseases, including HIV infection;
- Alcohol and other drug use;
- Tobacco use;
- Unhealthy dietary behaviors;
- Inadequate physical activity.

For this study, we used the most recent data from year 2017. This year's data included a total of 14,765 students in 9th through 12th grades.

2.2. Variables of interest

Variables on breakfast skipping

In the survey, students were asked "During the past 7 days, on how many days did you eat **breakfast**?" responses were:

A. 0 days;
B. 1 day;
C. 2 days;
D. 3 days;
E. 4 days;
F. 5 days;
G. 6 days;
H. 7 days.

A variable "skip_breakfast" was created, with a value of 1 (yes) if students chose "0 days" and 0(no) if students chose other answers.

Outcome Variables

Weight status

Students' height and weight information was collected through two questions: How tall are you without your shoes on? How much do you weigh without your shoes on? The corresponding BMI and BMI percentile for his/her age and gender were then calculated in the YRBSS data. According to literature, BMI does not measure body fat directly, but it is correlated with and can be considered an alternative to direct measures of body fat, such as skinfold thickness measurements [2].

The Centers for Disease Control and Preention (CDC) of the United States categorize adolescents weight status into four categories using the following standard (https://www.cdc.gov/obesity/childhood/defining.html) [3].

Table 1.

Weight Status Category	Percentile Range
Underweight	Less than the 5th percentile
Normal or Healthy Weight	5th percentile to less than the 85th percentile
Overweight	85th to less than the 95th percentile
Obese	95th percentile or greater

A variable "overweight or obese" was created, with a value of 1 (yes) if the student is overweight or obese, and a value of 0(no) if underweight or normal weight.

In the survey, students were asked "During the past 12 months, how would you describe your grades in school?"

A. Mostly A's;
B. Mostly B's;
C. Mostly C's;
D. Mostly D's;
E. Mostly F's;
F. None of these grades;
G. Not sure.

I created a dichotomous variable "below_A".

Table 2. – Variable

Demographic variables	
Age	
Gender	
Race/ethnic ity	
Diet habits	
Fruit	Duning the past 7 days, how many times did you eat fruit?
Fruit-juice	Duning the past 7 days, how many times did you drink 100% fruit juices such as orange juice, apple juice, or grape juice?
Salad	Duning the past 7 days, how many times did you eat dreen salad?
Carrot	Duning the past 7 days, how many times did you eat carrots?
Other-veg	Duning the past 7 days, how many times did you eat other vegetables?
Soda	Duning the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite?
Milk	Duning the past 7 days, how many dlasses of milk did you drink?
Skip-breakfast	Duning the past 7 days, how many days did you eat breakfast?

In the analysis, I also controlled for other variables including age, gender, race/ethnicity, and other diet habits. A variable table is included above.

2.3 Statistical Analysis

Logistic regression analysis is used.

$$In(odds\ of\ an\ event\ occurring) = In\left(\frac{P}{P-1}\right) = \beta + \beta_1 \times X_1 + \beta_2 \times X_2 + ... + \beta_n \times X_n.$$

P – is the probability of an event, which is convertible with odds;

X_n – is a predictor variable, and;

β_n – is a regression coefficient. The relationship between the odds ratio and the coefficients is $OR = e^{\beta}$.

– If the coefficient β of a variable X_n is larger than 0, X_n is related to a higher odds/probability of the event. The odds ratio related to X_n is above 1 in this case;

– If the coefficient of a variable X_n is equal to 0, X_n is not related to the event. The odds ratio related to X_n is equal to 1 in this case;

– If the coefficient of a variable X_n is smaller than 0, X_n is related to a lower odds/probability of the event. The odds ratio related to X_n is below 1 in this case.

Logistic Regression Modeling is a popular analytic technique to analyze the association between a set of predictors and a binary outcome.

The general formula of logistic regression is:

Since I studied two outcomes, I built two logistic regression models.

3. Results

3.1 Demographic profile of the study sample

After limiting to those with non-missing values of the key variables, the final study sample included 9361 high school students.

The average age was 16 years. 51% were females and 49% were males. Students were evenly distributed in grades of 9, 10, 11, and 12, respectively. In terms of race/ethnicity, the study sample included 46.7% Whites, 15.7% African Americans, and others.

3.2 Descriptive results on students' experiences at school

13.6% of students reported skipping breakfast. The rate is slightly higher among girls than among boys.

Table 3.

	Percent of students skipping breakfast
girls	14.3%
boys	12.8%

Table 4.

Age	Percent of students skipping breakfast
14	11.6%
15	12.0%
16	13.2%
17	14.9%
18	15.8%

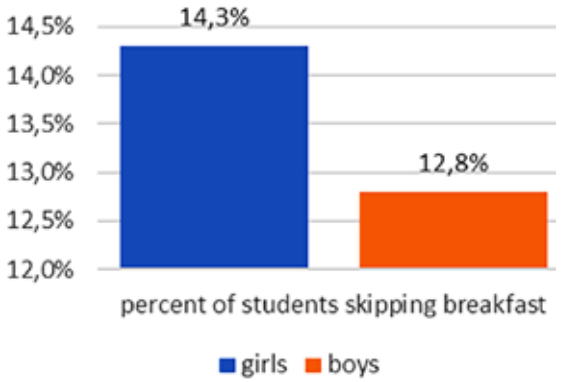

Figure 1. Percet of students skippiing breakfact by gender

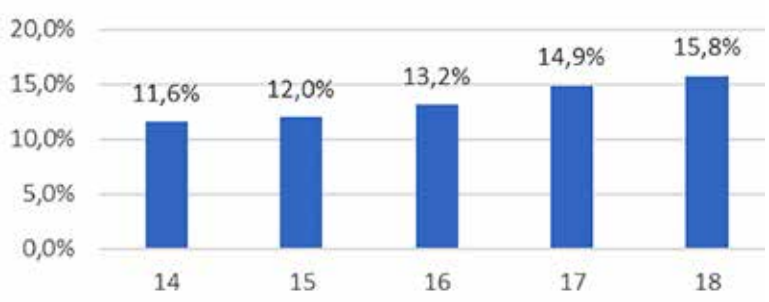

Figure 2. Percent of students skipping breakfas by age

Those who skip breakfast are more likely to be overweight or obese, and to perform poorer

Table 5.

Skip_breakfast	Normal weight	Overweight	Obese	Underweight
no	67.1%	16.1%	13.9%	2.8%
yes	60.0%	17.9%	19.6%	2.4%

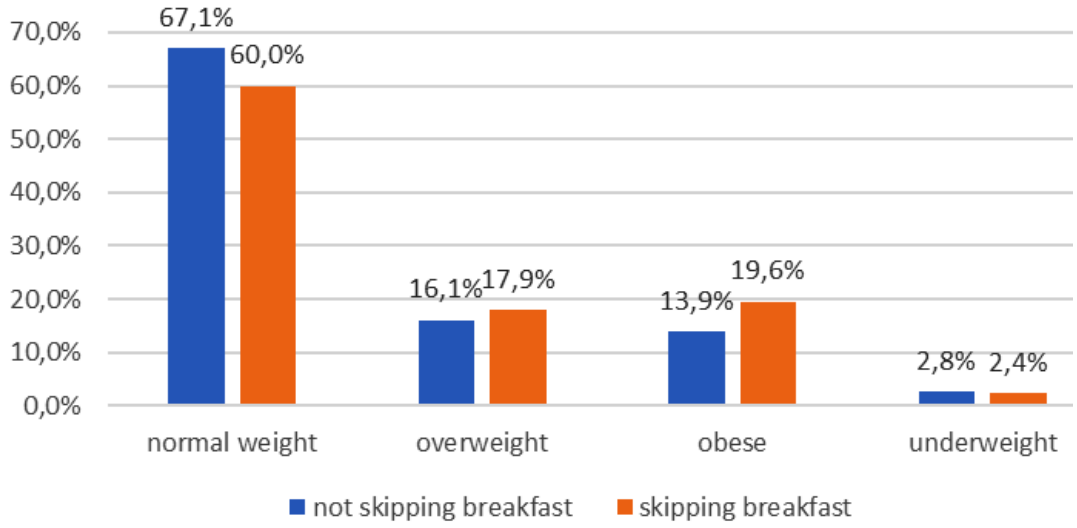

Figure 3. Weight status by breakfast habit

Table 6.

Skip_breakfast	A	B	C	D
no	41.1%	39.4%	16.8%	2.8%
yes	30.8%	40.5%	23.2%	5.5%

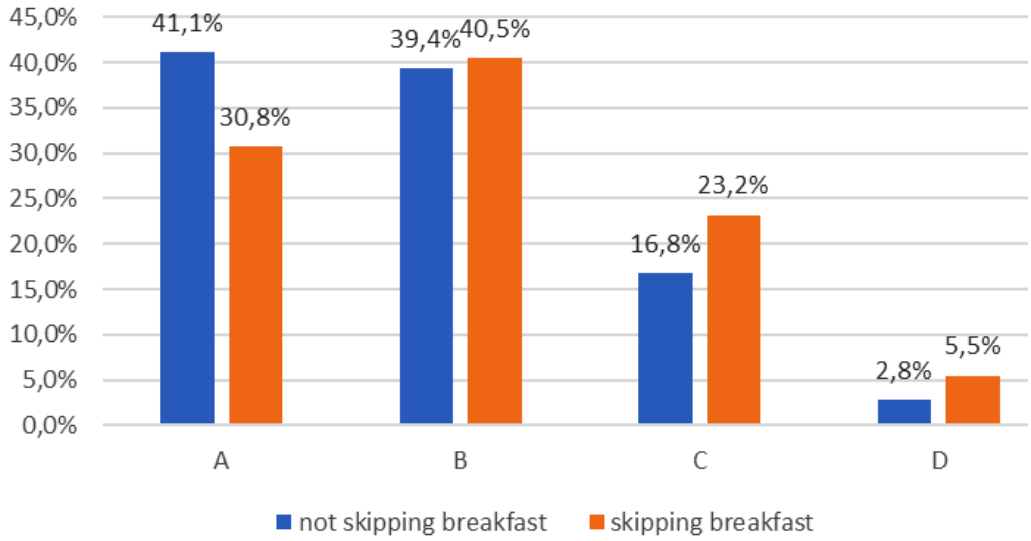

Figure 4. Academic grades by breakfast habit

3.3 Logistic regression

Table 7.

Odds Ration for overweight/obese (yes vs. no)					
	P-value	Odds Ration		Lower Cl	Upper Cl
Age	0.699948		0.9928	0.9574	1.029
Male	0.004689	**	1.1434	1.0419	1.254
Race					
Reference: White Americans					
Asian	0.16019		0.845	0.665	1.064
Black	< 0.001	***	1.8294	1.6065	2.082
Hispanic	< 0.001	***	1.8367	1.5887	2.121
Multiple_Hispanic	< 0.001	***	1.6331	1.4337	1.859
Other_races	0.00016	***	1.4006	1.1743	1.666
Fruit	0.040986	*	0.9681	0.9385	0.998
Fruit_juice	0.118214		1.0264	0.9933	1.06
Salad	0.004096	**	1.0644	1.0199	1.11
Carrot	0.891699		0.9965	0.9485	1.046
Soda	0.060901		1.0281	0.9986	1.058
Milk	0.298542		0.9846	0.9563	1.013
Other_veg	0.499833		0.9869	0.9498	1.025
Skip_breakfast	<0.001	***	1.3523	1.1919	1.533

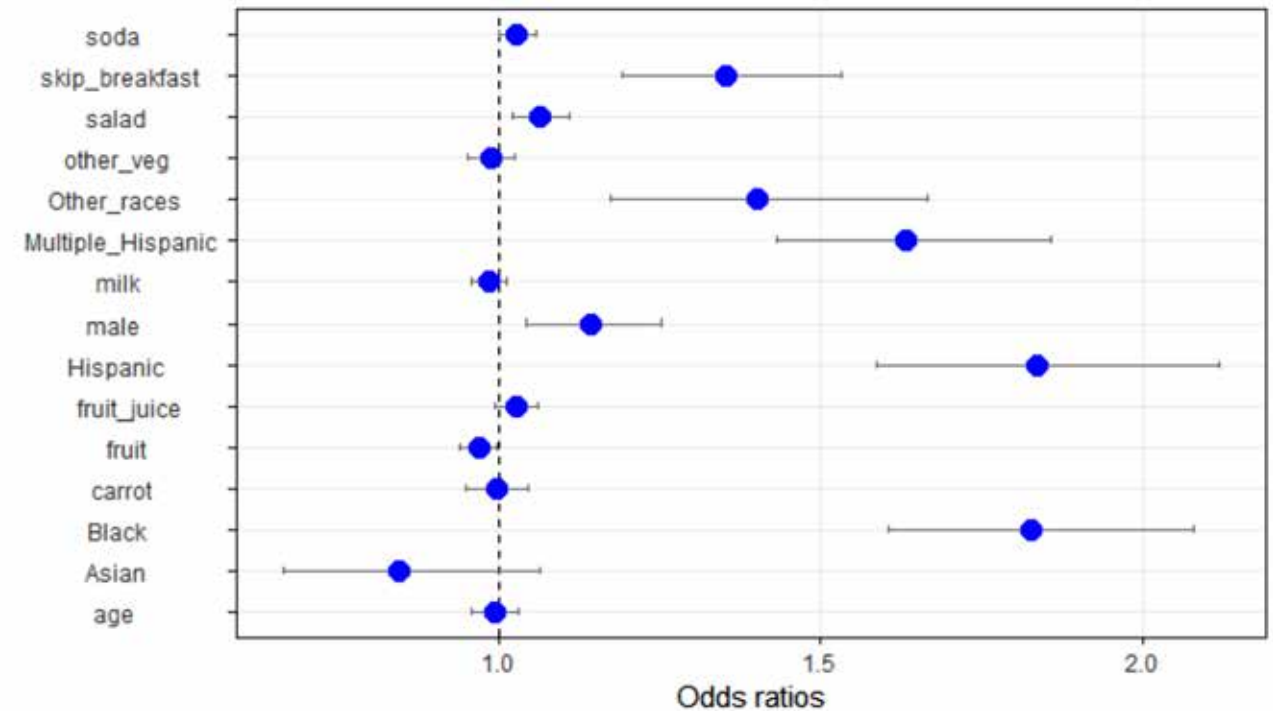

Figure 5. Factors predicting a student is overweight/obese

Table 8.

Odds Ration for academance (below A yes/no)					
	P-value	**Odds Ration**		**Lower Cl**	**Upper Cl**
Age	0.267		1.0205	0.984	1.057
Male	<0.001	***	1.5876	1.447	1.741
Race					
Reference: White Americans					
Asian	<0.001	***	0.5889	0.477	0.724
Black	<0.001	***	2.6699	2.325	3.07
Hispanik	<0.001	***	3.4056	2.898	4.015
Multiple_Hispanik	<0.001	***	2.069	1.815	2.36
Other_races	<0.001	***	1.494	1.065	1.772
Fruit	<0.001	***	1.0998	1.065	1.135
Fruit_juice	0.00251	**	0.9503	0.919	0.982
Salat	0.56058		1.013	0.969	1.058
Carrot	0.97317		0.9991	0.95	1.05
Other_veg	<0.001	***	0.9141	0.879	0.949
Soda	<0.001	***	1.1869	1.15	1.224
Milk	0.64243		0.9932	0.965	1.022
Skip_breakfast	<0.001	***	1.444	1.263	1.652

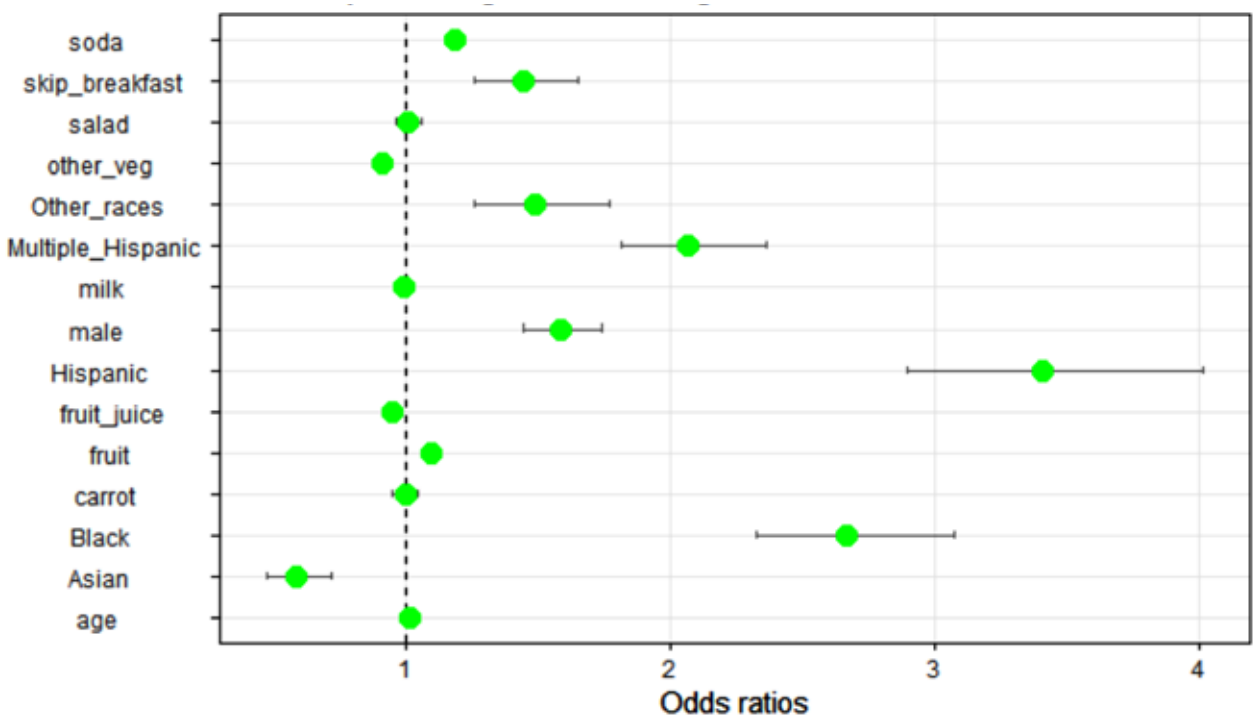

Figure 6. Factors predicting if academic grades is below A

From the Odds Ratios, skipping breakfast is associated with 1.35 times higher likelihood of being overweight or obese, compared with those who do not skip breakfast.

It is associated with 1.44 times higher likelihood of poorer academic performance.

4. Discussion

The percentage of high school students who skip breakfast is 14%. This is an alarming number and shows importance of adolescent and/or parent health education.

From Logistic regression analysis, skipping breakfast is associated with higher likelihood of being overweight or obese, and with poorer academic performance.

5. Conclusion

A large percentage of high school students skip breakfast. Skipping breakfast is negatively associated with weight status and academic performance.

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Section 4. Physiology

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SYSTEMIC IMMUNITY INDICATOR'S STATUS OF INDIVIDUALS FROM CONTAMINATED AREAS OF SUMY REGION

Abstract. The state of system immunity in individuals from the territories of the intensified radioecological control of Sumy region (IV-radiation zone; the density of soil contamination with isotopes of cesium-137 $3{,}7x10^4$–$18{,}5x10^4$ Bq/m^2) is under investigation. The obtained results indicate the functional load of the systemic immunity – immunosuppression of the cellular part, which is compensated by an increase of the concentration level of all classes of serum immunoglobulins.

Keywords: immune system, cellular link, mechanisms of non-specific anti-infection protection, humoral immunity, contaminated areas.

Introduction. No doubt that one of the biggest tragedies of 20th century by its consequences is the Chernobyl disaster. Although from the moment of the disaster has passed 33 years, this period of time exceeds the half-life period of ^{137}Cs. Its activity has been a framework for providing the status of the enhanced radioecological monitoring to an area. The statistics of medical institutions in Sumy region indicates the tendency to overall growth incidence of residents in the region [2; 3; 6; 11]. According to the Annual Public Health Report, the effect of radiological and non-radiological factors that appeared as a result of Chernobyl disaster led to health deterioration of all the categories of population: irradiated people, adult population of radiologically contaminated areas, children etc. [7; 11].

According to the scientific research, Sumy region is the territory of enhanced radioecological monitoring including Shostka and Yampil districts (IV-radiation zone; soil contamination density with cesium isotopes-137 $3{,}7 \times 10^4$–$18{,}5 \times 10^4$ bq/m^2), are distinguished by the incidence prevalence for children on tumor [7; 11]. The health condition issue of adult population who lives in contaminated area is quite controversial. Currently, Sumy region occupies the 21st place (out of 25) based on the incidence of certain classes of diseases. Their casual nexus with Chernobyl disaster is established in accordance with the current legislation [11]. This fact can be explained by the remoteness of the territory of the region from the epicenter of a nuclear explosion and the disfigurement of the soil activity of radionuclides [3; 6].

It is widely-known that ionizing radiation is an immunosuppressant which has been implemented at the level of the genetic apparatus and biological membranes of immune cells [9; 10; 12]. According

to modern opinions, the radiation-induced destabilization of the human genome is potentially oncogenic [12]. In addition, ionizing radiation is considered to be a powerful stress factor that could potentially lead to a decrease of the immunological status of irradiated individuals [4; 5; 9; 10].

From scientific sources it is known that residents of the contaminated areas experience prolonged low-intensity irradiation through the soil activity of the 137Cs isotope, radionuclides get through the respiratory tract and food [6; 9; 10].

It is a known fact that the human immune system is one of the most sensitive to the effects of exogenous and endogenous environmental factors. Its activity is integrative and any disruption into links of immunity may affect the system as a whole. Low-intensity prolonged radiation exposure can have an immunosuppressive effect on specific and non-specific factors and mechanisms of systemic immunity which directly affect the maintenance of the human body homeostasis [4; 5; 9; 10; 12].

So, all the above-mentioned evidences determined the timeliness of our research and defined its **goal** – to ascertain systemic immunity indicators status of individuals from contaminated areas of Sumy region.

Materials and Methods. For the period between 2016 and 2018 there were examined 200 individuals including the ones from contaminated areas (control group, 100 individuals) and residents from the enhanced radiological monitoring areas (IV-radiation zone; soil contamination density with cesium isotopes-137 $3,7 \times 10^4$–$18,5 \times 10^4$ Bq/m^2). All the examined individuals were students or staff members of Sumy State Teachers` Training University at the age from 18 to 35 and during the examination they had no acute diseases. Statistically, there were no significant difference between sexes of the examined individuals (women were examined during the follicular phase of menstrual period) that is why they were examined as a unitary group.

The total number of leukocytes was calculated with hemocytometer, absolute and relative quantities of their populations were calculated with help of Romanowski-Giemsa staining. Cell-surface antigene expression with Peripheral Blood Leukocytes was determined by means of immunofluorescence using monoclonal antibody to LT 3 (for testing the expression of Pan-T-cells CD3), LT 4 (for testing the activity expression of T-helper-cells CD 4), LT 8 (for testing the expression of CD8), LNK 16 (for testing the expression of CD16). The level of immunoglobulins in serum was determined with the help of radial immunodiffusion technique (Mancini) using monotypic serum against IgG(H), IgM(H), IgA(H). The phagocytic number of neutrophils, phagocytic and immunoregulatory indexes was calculated [8].

The examinations of the volunteers and their blood sampling were held by the medical staff of the Laboratory and Diagnostic Center «Diagnostyka Zdorov'ya» (Sumy, Ukraine). The blood sampling took place in the morning; all the individuals were in the fasted state. Status data about the radiation contamination was received at sanitary-epidemiological agency (Sumy, Ukraine).

The statistical process was performed with help of Microsoft Excel with variuos statistics methods. Authenticity of significance between samples was determined with Student's T-test. The average values are given as M ± m, where M is arithmetic average and m is a standard error of the mean. Deviation with $P < 0,05$ was considered as a significant one.

The research was done in compliance with bioethical standards and according to the current legislation of Ukraine [1]. All the volunteers gave the written permission for participation in the examination.

Results and Discussion. Systemic immunity indicators of residents from contaminated and conditionally ecologically balanced environment areas of Sumy region that are given in the table show that over researched period there is an absolute amount of leukocytes of residents from contaminated areas and has a tendency to decrease. The absolute amount of eosinophiles and basophils (absolute MXD level)

is on the control level and doesn't exceed a clinical standard in the study group. Meanwhile, the number of eosinophiles has grown up by 15% and the relative number of basophils has grown by 47% which is within the homeostatic norm. Absolute neutrophil level decrease was committed by 14%, phagocytic value decrease was committed by 12%. At the same time, the growth of absolute and relative number of monocytes by 1,6 and 1,8 times, respectively, also reaches reliable values.

During the research process, the total number of lymphocytes in the control and experimental group are within the clinical norm.

Table 1.– Indicators of systemic immunity in individuals from contaminated territories of Sumy region

Indicator	**Clinical norm**	**Control group (M ± m). N = 100**	**Experimental group (M ± m) N = 100**
Leukocytes, 10^9/l	4–12	6.40 ± 0.06	6.07 ± 0.03*
Eosinophils, 10^9/l	0.02–0.3	0.07 ± 0.02	0.07 ± 0.03
Eosinophils,%	0.5–5	1.00 ± 0.02	1.15 ± 0.05*
Basophils, 10^9/l	0.0–0.065	0.03 ± 0.01	0.04 ± 0.01
Basophils,%	0–1	0.45 ± 0.07	0.66 ± 0.06*
Neutrophils, 10^9/l	2.0–5.8	3.95 ± 0.03	3.38 ± 0.02*
Neutrophils,%	48–78	58.60 ± 0.45	55.68 ± 0.59
Phagocytic neutrophil count (PM)	40–80	76.13 ± 0.46	67.00 ± 0.57*
Phagocytic neutrophil index (FI),%	4–9	5.74 ± 0.13	5.65 ± 0.16
Monocytes, 10^9/l	0.09–0.6	0.37 ± 0.05	0.60 ± 0.03*
Monocytes,%	3–11	5.49 ± 0.03	9.88 ± 0.04*
Lymphocytes, 10^9/l	1–5	1.98 ± 0.08	1.98 ± 0.09
Lymphocytes,%	20–40	29.38 ± 0.21	32.62 ± 0.25
CD3, 10^9/l	0.4–3.8	1.58 ± 0.05	1.45 ± 0.04
CD3,%	50.0–80.0	79.80 ± 0.38	73.23 ± 0.48
CD4, 10^9/l	0.2–2.2	0.76 ± 0.04	0.71 ± 0.06
CD4,%	33.0–46.0	48.10 ± 0.06	48.97 ± 0.11
CD8, 10^9/l	0.1–1.4	0.46 ± 0.03	0.45 ± 0.06
CD8,%	17.0–30.0	29.10 ± 0.06	31.03 ± 0.05
Immunoregulatory index (CD4/ CD8), c.u.	1.4–2.0	1.65 ± 0.12	1.58 ± 0.16
CD16, 10^9/l	0.08–1.1	0.36 ± 0.02	0.29 ± 0.03*
CD16,%	12–23	22.90 ± 0.30	20.00 ± 0.42*
CD22, 10^9/l	0.12–1.48	0.40 ± 0.05	0.53 ± 0.05*
CD22,%	17–31	20.20 ± 0.13	26.77 ± 0.14*
Ig G, g/l	9–20	12.85 ± 0.38	13.75 ± 0.29
Ig M, g/l	0.7–3.7	1.54 ± 0.14	2.86 ± 0.22*
Ig A, g/l	0.9–5.0	1.83 ± 0.16	2.34 ± 0.17*

** – P < 0,05 – the significance of the difference between the control and experimental groups*

The relative number of lymphocytes among residents of contaminated areas of Sumy region shows a measure of growth. However, there is a tendency to a decrease in the absolute and relative number of CD3-lymphocytes in the experimental group over the research period.

The absolute number of CD4-lymphocytes of residents from enhanced radioecological monitoring areas shows a slight tendency to decrease. At the same time, the relative content of this class of immunocompetent cells in both groups exceeds the limits of the clinical norm, with the prevalence of the study group values over the respective values of the control group. The absolute number of CD8-lymphocytes in study group is on the same level with the control group and it doesn't exceed the clinical norm. But the relative number of T-helper / suppressors of residents from contaminated areas tends to increase (in comparison with the values of this indicator of residents from conditionally ecologically balanced environment areas of Sumy region) and exceeds the clinical norm.

During the research period the immunoregulatory index had a tendency to decrease. The NK indicators test shows the decline of natural killers (by 19% and 12%) in peripheral blood against growth of mononuclear forms.

Absolute and relative number of B-lymphocytes with CD22 phenotype grow by 1,3 times (for both indicators) in researched time period. It was found that there is a tendency to increase of IgG among the residents of enhanced radiological monitoring areas; it was also found that the growth of IgM and IgA related to the control value by 1,8 and 1,3 times.

Conclusions. To sum up, the severe immunosuppression was examined across the contaminated areas of Sumy region. To my mind, there is a strong reason to provide the monitoring of health status for the habitants, since their organisms are under the prolonged exposure of the influence of the low-intensity ionizing emission.We believe, this research may serve as followings: basis for the formation of risk groups, the development and realization of stochastic prevention measures strategies of the chronic low-dose radiation (including radiogenous cancer) among the different social groups.

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INFLUENCE OF THE ALKALOIDS OF ANABAZIN, ANABAZAMIN AND LUPININ ON THE MOTOR EXCITATION CAUSED BY PHENAMINE

Abstract. In this paper it is given an assessment of the effect of activation of alkaloids of anabazine, anabazamine and lupinin in various doses on phenamine-induced motor excitation of mice. These alkaloids act on adrenergic processes. Reduced fenamine excitation and increased fenamine hyperthermia and group toxicity in mice.

Keywords: alkaloids, anabazine, anabazamine, lupinin, phenamine, caffeine, locomotion, rising.

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ВЛИЯНИЕ АЛКАЛОИДОВ АНАБАЗИНА, АНАБАЗАМИНА И ЛУПИНИНА НА ВЫЗВАННОЕ ФЕНАМИНОМ ДВИГАТЕЛЬНОЕ ВОЗБУЖДЕНИЕ

Аннотация. В статье приводиться оценка влияния активность алкалоидов анабазина, анабазамина и лупинином в различных дозах на вызванное фенамином двигательное возбуждение мышей. Эти алкалоиды воздействуют на адренергические процессы. Уменьшение фенаминового возбуждения и усиление фенаминовой гипертермии и групповой токсичности на мышах.

Ключевые слова: алкалоиды, анабазин, анабазамин, лупинин, фенамин, кофеин, локомоция, вставания.

Актуальность исследований. На сегодняшний день большое внимание уделяется изучению психотропных препаратов, содержащих природные соединения, для операции и лечения заболеваний в мировом уровне. В Узбекистане располагает большими ресурсами лекарственных растений. Одним из основных источников этих растений является вид *Anabasis aphylla* L. Из 3 алкалоидов, выделенных из этого растения [4, 292], два относятся к пиридиновому (анабазин, анабазамин) и лупинин к хинолизидиновому рядам. Активность многих психотропных препаратов оценивается на животных по взаимодействию с резерпином и его производными (антидепрессанты) и с фенамином (нейролептики и антидепрессанты), а также с апорморфином (нейролептики и антидепрессанты). Эти препататы были использованы нами для исследования алкалоидов. Воздействия алкалоидов анабазина, анабазамина и лупинина на разных процессах организма животных изучена [1, 26–33; 2, 20–22; 3, 147–148; 5, 25–31], однако влияние этих алкалоидов на вызванное фенамином двигательное возбуждение подробно неизучена. Целью исследования являлась оценка влияния активации алкалоидов анабазина, анабазамина и лупинином в различных дозах на вызванное фенамином двигательное возбуждение мышей.

Объекты и методы исследования. Опыты выполнены на белых бепородных мышах 18–20 г, обоего пола. Контрольные и подопытные группы состояли не менее, чем из 7–8 животных каждая. Двигательное возбуждение использовали для оценки влияния алкалоидов на вызванную фенамином стимуляцию локомоции и вставаний – вертикального компонента двигательной ориентировочной реакции. Как и в опытах с резерпином, мышей помещали группами по 7–8 животных в металические коробки, а другая такая же коробка служила для измерения двигательной активности у каждого животного в отдельности.

Локомоцию измеряли с помощью клавишного счетчика по количеству пересечений лучей креста, начерченного на дне коробки. Одновременно подсчитывали количество вставаний за 2 мин. через 15 мин. после введения фенамина. Все экспериментальные градированные данные обрабатывали статистически по t – тесту Стьюдента.

Результаты исследований и их обсуждения. Двигательное возбуждения. В этой опытов двигательную активность оценивали по локомоции и по вставаниям. Оказалось, что вызываемое фенамином двигательное возбуждение проявляется лишь в усилении локомоции, количество же вставаний не увеличивается. Анабазин в дозе 6 мг/кг, анабазамин в дозах 25 и 50 мг/кг и лупинин в дозах 40 и 80 мг/кг достоверно уменьшали вызываемое фенамином возбуждение локомоции (таблица 1).

Как видно из (таблицы 2), анабазамин в дозе 25 мг/кг достоверно уменьшал эффект фенамина в первые 15 мин. и через 1 и 2 часа он незначительно повышает действие фенамина по локомоции (недостоверно). Алкалоид сам не изменял двигательную активность.

Таблица 1.– Влияние алкалоидов на возбуждающее действие фенамина у мышей

№	Препараты	Дозы, мг/кг (в/б и р/о)		Локомоция	Вставания
1.	H_2O+H_2O	–	–	16,20 ± 1,81	14,1 ± 2,05
2.	H_2O+Ф	–	10	$30,00 \pm 2,21^{**}$	13,2 ± 2,08
3.	АНБ+H_2O	3	–	18,50 ± 1,38	19,2 ± 1,69
4.	АНБ+Ф	3	10	25,2 ± 3,48	15,4 ± 2,10
5.	АБМ+H_2O	25	–	17,5 ± 2,98	15,6 ± 2,68
6.	АБМ+Ф	25	10	$18,8 \pm 2,12^{xx}$	8,6 ± 1,98
7.	Луп+H_2O	40	–	17,2 ± 1,88	20,4 ± 2,06
8.	Луп+Ф	40	10	$21,4 \pm 3,22^{x}$	15,0 ± 3,87
9.	H_2O+H_2O	–	–	20,3 ± 1,29	15,5 ± 1,66
10.	H_2O+Ф	–	10	$33,2 \pm 2,77^{**}$	17,5 ± 1,16
11.	АНБ+H_2O	6	–	19,0 ± 1,76	15,7 ± 2,02
12.	АНБ+Ф	6	10	$19,0 \pm 2,26^{xx}$	$8,4 \pm 3,06^{x}$
13.	АБМ+H_2O	50	–	16,7 ± 3,07	$8,4 \pm 2,35^{*}$
14.	АБМ+Ф	50	10	$15,6 \pm 3,55^{xx}$	9,9 ± 3,27
15.	Луп+H_2O	80	–	15,2 ± 2,22	12,4 ± 3,58
16.	Луп+Ф	80	10	$18,6 \pm 2,59^{xx}$	11,4 ± 2,62

АНБ-анабазин, АБМ-анабазамин, Луп-лупинин, Ф-фенамин. Препараты вводили за 1 час до фенамина. в/б- внутрибрюшинно, р/о- внутрь. В каждой группе по 8 мышей. $^{(*)}$ – различие по сравнению с группой H_2O+H_2O: $^{*}P < 0,05$, $^{**}P < 0,001$. $^{(x)}$ различие по сравнению с группой H_2O+Ф: $^{x}P < 0,05$, $^{xx}P < 0,01$.

В дальнейшем нашей задачей было уточнить, как влияют алкалоиды на возбуждающий эффект кофеина. Установлено, что на мышах анабазин (6 мг/кг) и анабазамин (25 и 50 мг/кг) достоверно уменьшают эффект кофеина по локомоции. Анабазин в дозе 3 мг/кг и лупинин в обеих использованных дозах не оказывали влияния. Кофеин сам не влиял на вставания (таблица 3).

Таблица 2.– Влияние анабазамина на возбуждающее действие фенамина у мышей

№	Препараты	Дозы мг/кг		Через 15 мин		Через 60 мин		Через 120 мин	
				Локомоция	Вставания	Локомоция	Вставания	Локомоция	Вставания
1.	H_2O+H_2O	–	–	15,62 ± 1,48	10,25 ± 2,06	9,25 ± 1,56	9,00 ± 1,79	4,50 ± 1,59	4,12 ± 1,66
2.	H_2O+Ф	–	2,5	21,37 ± 2,56	3,62 ± 1,06*	16,75 ± 2,93	4,13 ± 1,04	16,87 ± 2,16**	9,50 ± 1,99
3.	АБМ+H_2O	25	–	12,12 ± 3,36	5,37 ± 2,31	9,00 ± 1,45	5,25 ± 1,98	5,50 ± 0,75	2,87 ± 0,81
4.	АБМ+Ф	25	2,5	10,75 ± 2,60x	3,75 ± 2,27	22,25 ± 3,45*	4,75 ± 1,54	28,25 ± 5,05**	6,62 ± 1,10

АБМ-анабазамин, Ф-фенамин. Анабазамин вводили в/б за 30 мин. до фенамина в/б. В каждой группе по 8 мышей-самок. (*) – различие по сравнению с соответствующим контролем: *P < 0,05, ** P < 0,01. (x) различие по сравнению с группой H_2O+Ф: xP < 0,05.

Таблица 3.– Влияние алкалоидов на возбуждающий эффект кофеина у мышей

№	Препараты	Дозы, мг/кг(в/б и р/о)		Локомоция	Вставания
1.	H_2O+H_2O	–	–	17,25±2,75	12,6±2,52
2.	H_2O+К	–	20	35,71 ± 3,98*	17,7 ± 1,54
3.	АНБ+H_2O	3	–	21,5 ± 3,65	15,6 ± 1,98
4.	АНБ+К	3	20	28,4 ± 4,01	17,3 ± 1,12
5.	АБМ+H_2O	25	–	21,0 ± 2,44	14,1 ± 2,67
6.	АБМ+К	25	20	24,3 ± 1,11x	11,1 ± 1,29
7.	Луп+H_2O	40	–	13,8 ± 2,55	10,3 ± 2,60
8.	Луп+К	40	20	27,4 ± 4,42	20,5 ± 3,00
9.	H_2O+H_2O	–	–	17,6 ± 2,14	13,2 ± 1,00
10.	H_2O+К	–	20	30,7 ± 1,53*	15,0 ± 0,62
11.	АНБ+H_2O	6	–	18,8 ± 2,23	15,4 ± 1,84
12.	АНБ+К	6	20	19,6 ± 2,25xx	14,3 ± 1,64
13.	АБМ+H_2O	50	–	16,3 ± 3,20	9,0 ± 1,73
14.	АБМ+К	50	20	18,8 ± 2,21xx	14,6 ± 3,26
15..	Луп+H_2O	80	–	20,8 ± 1,59	16,2 ± 1,74
16.	Луп+К	80	20	23,9 ± 2,99	15,5 ± 1,85

АНБ-анабазин, АБМ-анабазамин, Луп-лупинин, К-кофеин. Препараты вводили за 1 час до кофеина, в/б- внутрибрюшинно, р/о- внутрь. В каждой группе 7–8 мышей. (*) – различие по сравнению с группой H_2O+H_2O: *P < 0,01. (x) различие по сравнению с группой H_2O+К: xP < 0,05, xxP < 0,01.

Анабазин и анабазамин уменьшают возбуждающий эффект не только фенамина, но и кофеина. Эти наши результаты хорошо согласуются с данными И. С. Хазбиевич и С. Х. Насирова [3, 147–148]. Уменшение фенаминового возбуждения под влиянием больших доз алкалоидов может быт связано с неспецифическими угнетающим действием алкалоидов. Подобное же объяснение предложено для антагонизма производных γ – аминомасляной кислоты с фенамином и с дру-

гими возбуждающими препаратами. Антагонизм с феномином первая короткая фаза действия анабазамина (возможно и другие алкалоидов). Во второй фазе анабазамин и другие алкалоиды усиливали все три исследованных эффекта фенамина: двигательное возбуждение, гипертермию и группавую токсичность.

Выводы. Алкалоиды анабазин, анабазамин и лупинин воздействуют на адренергические процессы. Уменьшение фенаминового возбуждения и усиление фенаминовой гипертермии и групповой токсичности на мышах. Таким образом испытаное алкалоиды вмешивается в нервной системы животных.

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