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DERMATOGLYPHIC ANALYSIS IN TURNER'S SYNDROME

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ABSTRACT

The palm- and finger-prints of 10 patients suspected to have Tumers syndrome were analysed. The results were compared to the dermatoglyphic patterns characteristic of Turner's syndrome found in the literature. In 3 cases a dermatoglyphic picture corresponding to that of the literature was observed. In one case a perfect analysis could not be performed because of a congenital malformation of one of the hands. In 4 cases no perfect correspondence was found. With the aid of dermatoglyphic examinations the possibility of Turner's syndrome was excluded in 2 cases. In these 2 cases the karyotypes did not prove to be X monosomy either. The method is believed to be useful for differential diagnosis of gonadal dysgenesis.

The importance of dermatoglyphics in indicating chromosome abnormalities is well known but the data concerning Turner's syndrome are not quite concordant. The characteristic features emphasized by all the authors (Alter, 1967; Forbes, 1964; Holt and Lindsten, 1964; Loeffler, 1967; Penrose, 1967; Spasov et al., 1975; Uchida and Soltan, 1963; Uchida et al., 1964; Gorlin et al.,1990; Kobylıansky et al., 1997; Rıchards et al., 1997: are as follows:

1. a great number of whorls (more than 5) on the fingers
2. high total ridge count (TRC) (higher than 140)
3. axial triradius in t position
4. high frequency of the four-finger fold
5. opinions differ concerning the high value of the atd angle

According to Penrose (1967) it is about 60, according to Spasov et al. (1975) if the sum of the angle of the two hands is more than 90, it is suggestive of Turner's syndrome.

Alter (1965; 1967) enumerates further characteristic features:

1. double loop on the hypothenar
2. an increased ab ridge count
3. loop on the thumb
4. radial loop on the second finger.

According to Holt and Lindsten (1964):

1. the patterns of the thenar are rare
2. radial loop on the fourth finger
3. the whorl pattern is the most frequent on the first and fourth fingers
4. the arch pattern is more rare.

According to Spasov et al. (1975) the additional triradii of the palm are also characteristic.

Because of the somewhat contradictory data, we decided to observe the paint- and finger-prints of 10 patients with clinical Turner's syndrome.

MATERIAL AND METHODS

The data were analysed using the method of Cummins and Midlo (1961) and modified by Penrose (1963; 1968). Our results were compared to the characteristic features of Turner's syndrome found in the literature, and to the results of the control group. We used the palm- and finger-prints of 40 medical students as a control. The significance of the difference from the control was controlled by the X^2 test. In 3 cases the dermatoglyphic features corresponded to the literary ones; in one case a complete analysis could not be performed because of congenital malformation of one of the hands; in four cases most of the characteristic features were identified on the prints, in two cases the possibility of Turner's syndrome was excluded.

During the chromosome analysis 8 cases proved to be X monosomy, in the two cases excluded on the basis of dermatoglyphic features we found normal karyotypes.

RESULTS

From the qualitative features in the types of the ending of the main lines we did not find forms characteristic of Turner's syndrome. The frequency of the reduction of the C main line and of the supernumerary triradii was established. Contrary to the literary data, in our examinations frequency of the reduction of the C main line was higher than in the control group, but not significantly. The ratio of the supernumerary triradii was significantly higher ($p<2.5\%$) in the group of patients with Turner's syndrome (Fig.1). The interdigital spaces bordered by the main lines proved to be richer in pattern, but the difference was not significant (Fig. 2).

In the t position of the axial triradii the control group and in the t'and t'' position the group of patients with Turner's syndrome showed a higher percentage. but the difference was again not significant (Fig. 3). The literary data do not refer to the importance of the number of the axial triradii. The 1t showed a higher ratio in the control group, the 2t in the group with Turner's syndrome. The difference was significant (p<=2.5%) (Fig.3).
In agreement with the literary data (Alter, 1965; 1967; Holt and Lindsten,1964; Spasov, 1975; Uchida and Soltan, 1963; Uchida et al., 1964) the patterns of the hypothenar were much stronger in the group with Turner's syndrome.
The difference between the patterned and empty hypothenars proved to be sig- nificant (p<0.1 %). We did not find the characteristic frequency of the big double loop described by Alter (1965; 1967), though it was found in one of our cases.

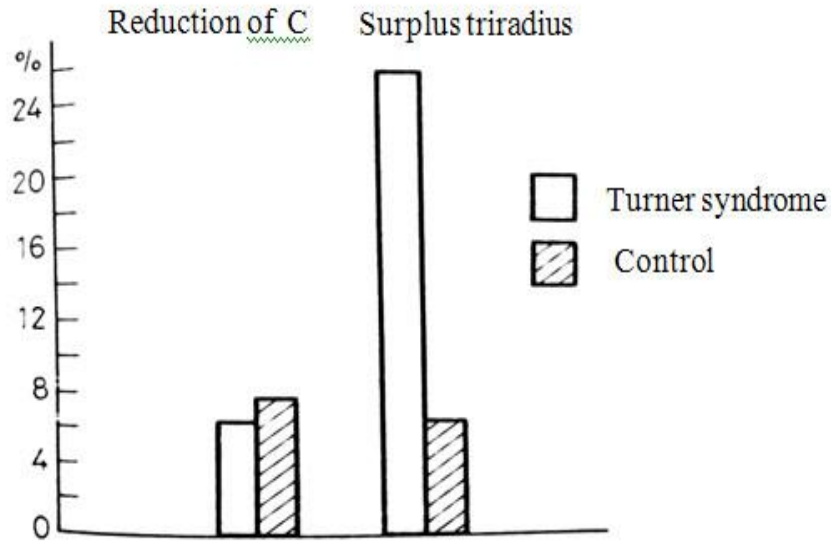

Figure 1. Comparison of the reduction of C main line and the surplus triradius.

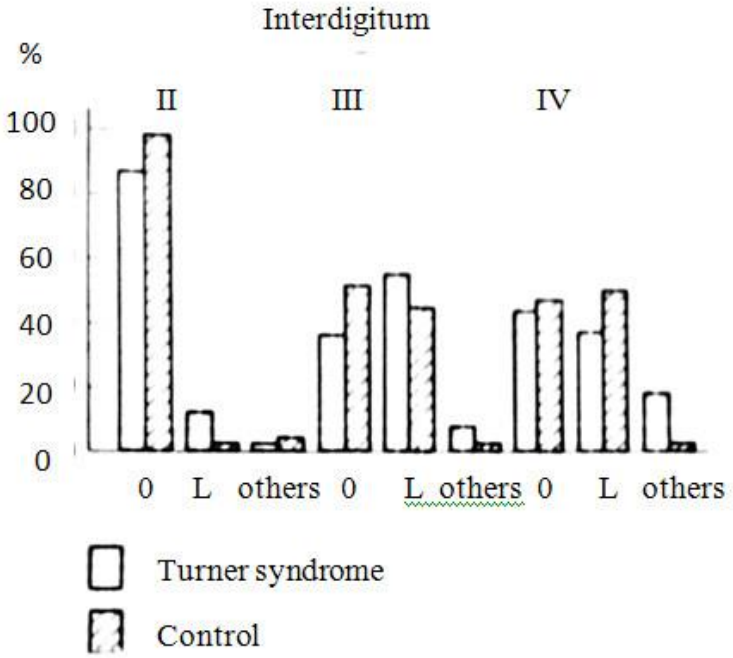

Figure 2. Pattern of the interdigital areas.

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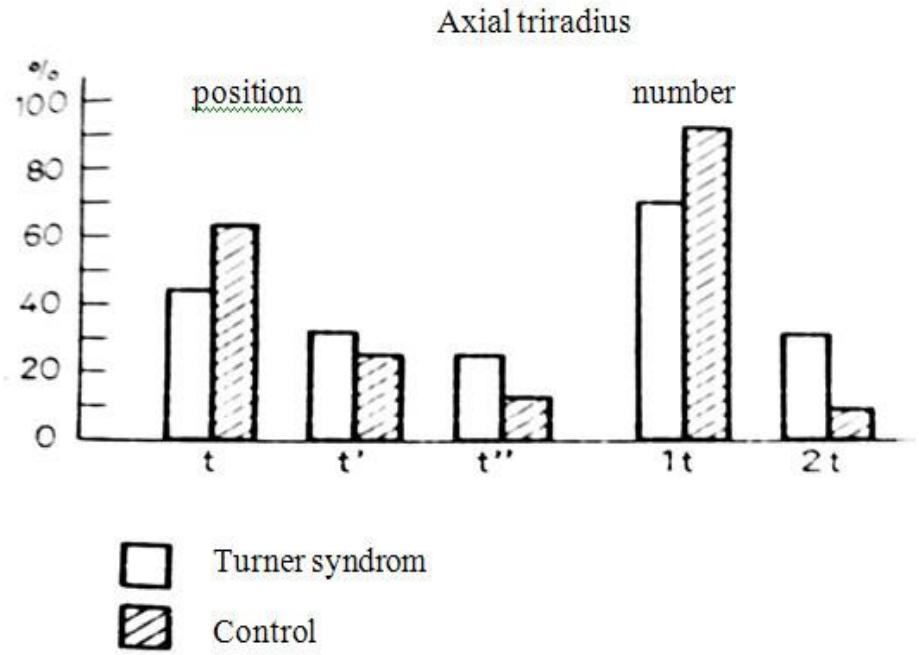

Figure 3. The position and number of axial triradii.

We found the thenar also to be richer in pattern in the group with Turner's syndrome than in the control group, contrary to the literary data (Holt and Lindsten, 1964). The difference was significant (p<5%) (Fig. 4).

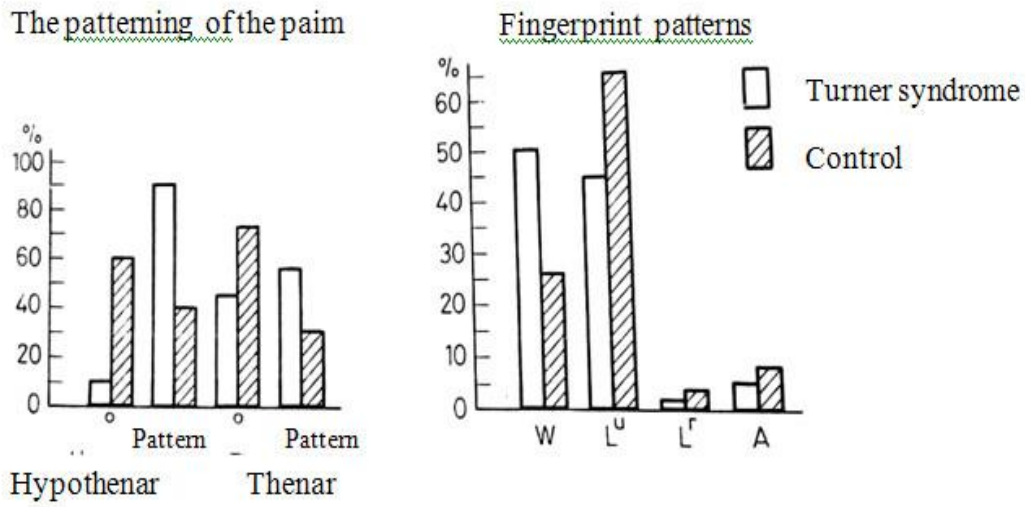

Figure 4. Comparative study of the patterns of the palm-and finger-prints.

Of the finger patterns in the Turner's group the whorl pattern was most frequently found followed by the ulnar loop, the arch and the radial loop (Fig. 4). We found the arch pattern only in the two patients with gonadal dysgenesis excluded from the group of Turner's syndrome. In the 8 patients with Turner's syndrome the frequency of the arch was 0. In the normal population the ulnar loop is the most frequent, then the whorl, after that the arch and the radial loop. This was also seen in our control group. The differences were significant (p< 0.001). The frequency of the whorls proved to be the highest not on the first and fourth but on the fourth and fifth fingers, contrary to the data of Holt and Lindsten (1964). We

found the radial loop on the second finger, instead of the fourth. A characteristic feature, though it is not a dermatoglyphic formation, is the defect of the flexion ridges, the so-called four-finger ridges or monkey- groove, which is quite frequent. We found it on both hands of two patients, on | one hand of 4 patients, and there was only one patient without this formation. In the two cases excluded from the patients with clinical Turner's syndrome there was no four-finger ridge. It was very rare in the control group; the difference was significant (p« 0.001) (Fig. 5).

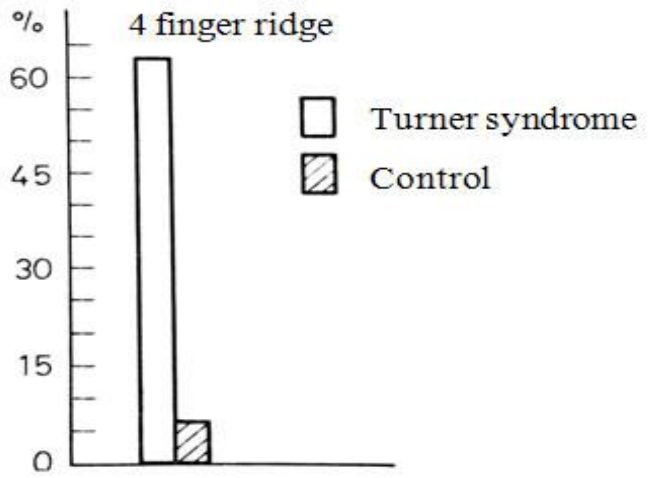

Figure 5. Frequency of appearance of four finger ridge ("monkey-groove").

Analysing the quantitative features, we compared their average in the two groups but we did not make a significance test. The increase of the maximal atd angle is considered by all the authors to be very important in Turner's syndrome. In our examination the average of the Turner's group was 108.63 while that of the control was 91.61. There undoubtedly was an increase, but contrary to the opinion of Spasov et al. (1975), the average of the control group was higher than 90.

Our material also showed an increase of the ab ridge count but at the same time a much greater decrease of the td ridge count. The latter was the result of the axial triradii being in a higher position (Fig. 6). We determined the total ridge count of the palm as the sum of the ab, cd and td ridge counts. As the decrease of the td was higher than the increase of the ab, the total ridge count of the palm showed a decreasing tendency (Fig. 6).

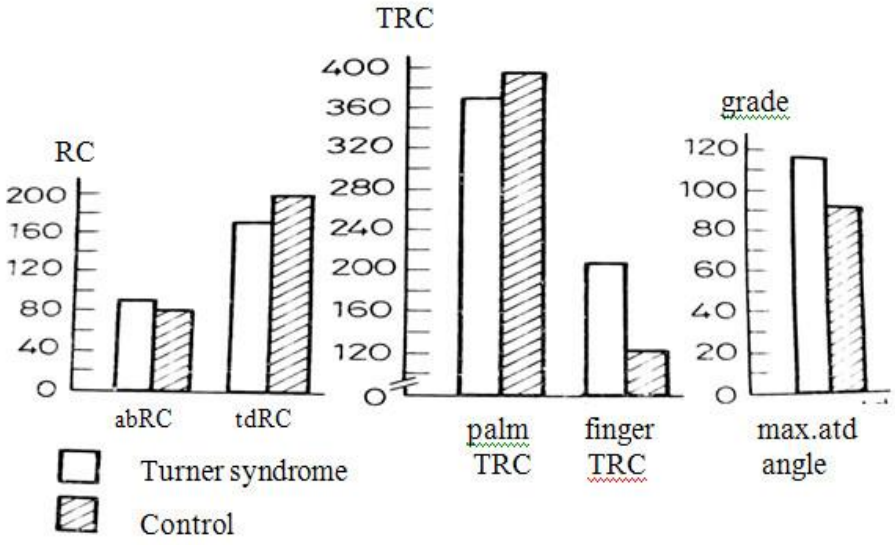

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Figure 6. Comparison of quantitative characteristics (RC,TRC, maximal atd angle).

The total ridge count of the fingers proved to be very high in our material with Turner's syndrome. If the TRC is higher than 140 this indicates the presence of Turner's syndrome. The average in our group was 209, while that of the controls 123 (Fig. 6).

Though it cannot be found in the literature, we counted the intensity of patterns of the palm and the fingers. This means the number of all triradii in both cases. The normal intensity of patterns of the palm is 10. It was 12.63 in our Turner's group, and 10.70 in the control group. This value was in agreement with the significantly higher number of the supernumerary triradii (Fig. 7). A still greater difference was found in the intensity of the patterns of the fingers, which can be attributed to the significantly higher ratio of the whorls (Fig. 7).

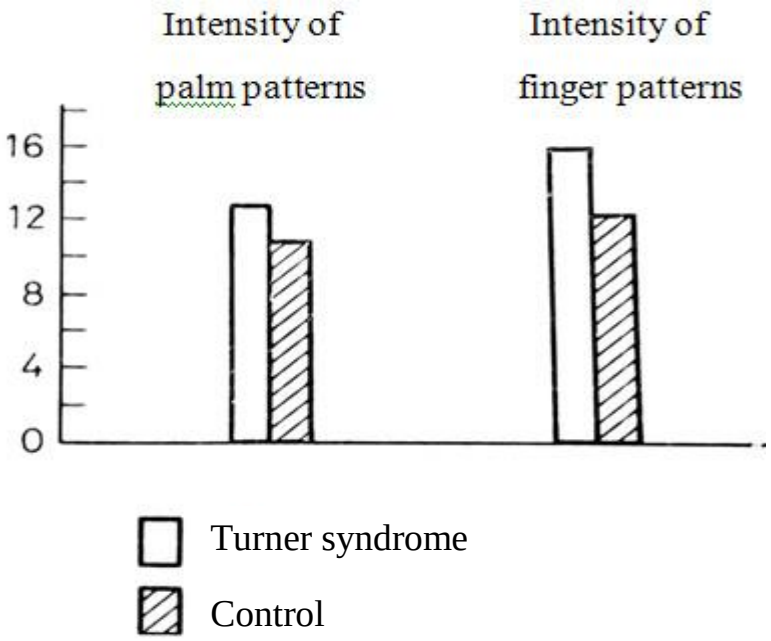

Figure 7. Differences in intensity of palm and finger patterns.

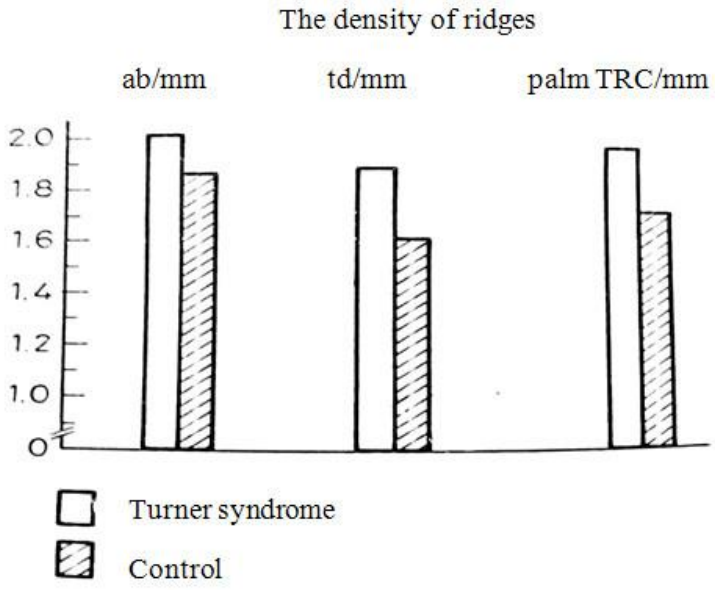

Figure 8. Examination of the density of ridges as a new parameter. (By the density of ridges we mean the ratio between the ridge count and the length in mm.

We determined the ridge density of ab, td, and on all the particular parts of the palm. We could not find any corresponding data in the literature. All the ridge densities were much higher than in the control group; thus the appearance of finer, thinner ridges can be considered to be another characteristic feature of Turner's syndrome (Fig. 8).

CONCLUSIONS

In our examination we observed a great number of dermatoglyphic features, and in this way we got nearer to the shaping of the exact diagnosis based on the skin ridge system.

The fact that we found a patient with gonadal dysgenesis in the control group by observing the dermatoglyphic picture also shows the correctness of our approach. Her detailed examination has not yet been finished.

We consider this method important in the differential diagnosis of gonadal dysgenesis. We shall carry on with our examination with greater material of Turner's syndrome and gonadal dysgenesis.

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COVID-19 AND MASSIVE EMBOLISM

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ABSTRACT

Objective: Hospitalized patients with COVID-19 were characterized by a high rate of thromboembolic complications and in hospital mortality.
The exact mechanisms of COVID-19 induced thrombosis have not been elucidated.
The early pathogenesis in COVID-19 (Huertas *et al*.) pneumonia defined by a widespread endotheliilitis affecting multiple organ systems, viral inclusion are observed within endothelial cells accompanied by apoptosis, inflammatory cell infiltration and microvascular thrombosis.
The primary infection initiates alveolar injury and the resulting inflammatory response, including production of inflammatory cytokines, including IL-6, as well as activation and recruitment of mononuclear cells and neutrophils causing more tissue damage, including damage to the capillary endothelium. In addition to the procoagulant effectors derived as the result of inflammation the usual thrombo-protective state of the vascular endothelial cells is disrupted;
Both pathophysiologic changes lead to the development of microvascular thrombosis. Over time the pathology of ARDS progresses to a proliferative and then a fibrotic state, which is fatal.
We presented one case when the patient developed severe respiratory failure after massive pulmonary embolism and coma after ischemic stroke. Patient had many comorbidities with COPD, heart failure (HFrEF) and diabetes mellitus.
Conclusion: High values of d-dimer could be related to a higher activation of blood coagulation in COVID-19 patients secondary to a systemic inflammatory response syndrome – or as a direct consequence of the SARS-CoV-2 itself. Pulmonary thrombosis was the confluence of processes, endothelial inflammation with no evidence of DVT. Tissue factor, up-regulated on platelets, leucocytes during inflammation, leading to activation coagulation pathways and promote the formation of fibrin. The profound hypoxaemia is a likely driver of vasoconstriction, inflammation and thrombosis. The origin of Covid-19-associated pulmonary emboli and lung microcirculatory thrombotic disease: Interaction of inflammation and coagulation
Keywords: Thrombosis, Pulmonary embolism, inflammation.

Introduction: Hospitalized patients with COVID-19 were characterized by a high rate of thromboembolic complications and in hospital mortality.
The exact mechanisms of COVID-19 induced thrombosis have not been elucidated.
The early pathogenesis in COVID-19 (Huertas *et al*.) pneumonia defined by a widespread endotheliilitis affecting multiple organ systems ,viral inclusion are observed within endothelial cells accompanied by apoptosis, inflammatory cell
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The primary infection initiates alveolar injury and the resulting inflammatory response, including production of inflammatory cytokines, including IL-6, as well as activation and recruitment of mononuclear cells and neutrophils causing more tissue damage, including damage to the capillary endothelium. In addition to the procoagulant effectors derived as the result of inflammation the usual thrombo- protective state of the vascular endothelial cells is disrupted;
Both pathophysiologic changes lead to the development of microvascular thrombosis. Over time the pathology of ARDS progresses to a proliferative and then ultimately a fibrotic state, which is fatal. We presented one case when the patient developed severe respiratory failure after massive pulmonary embolism and coma after ischemic stroke. Patient had many comorbidities with COPD, heart failure (HFrEF), chronic renal failure and diabetes mellitus.
Patient, male, 70 years old, was admitted in our hospital with respiratory failure and coma. Patient was started mechanical ventilation. CTPA revealed massive pulmonary embolism and bilateral infiltrates. Thrombotic masses are reflected at different levels in the bilateral pulmonary arteries. Areas of infarction-pneumonia are detected against the background of the right basal infiltration.

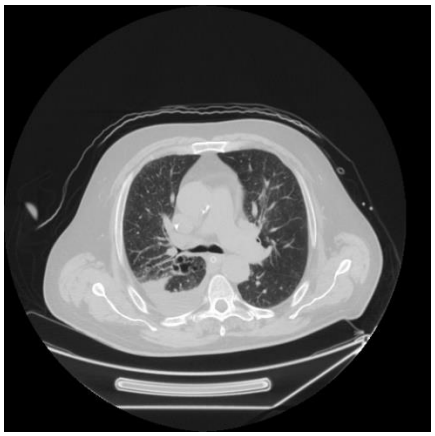
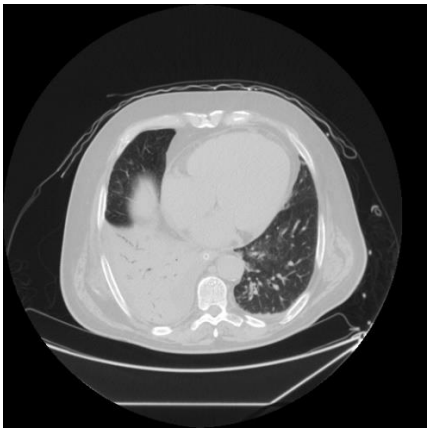
a  b 

Figure 1

Figure 1. 05/10/2020. Computed tomography, axial section. Lung window. Incision at the level of the tracheal bifurcation
a. Incision at the level of the basal segments of the lung
b. In the right parenchyma of the lung, there are foci of bronchiectasis and extensive basal compaction-infiltrative changes

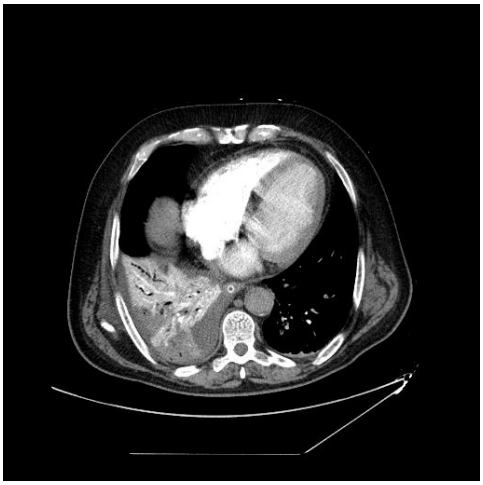
a  b 

Figure 2

Figure 2. 10.05.2020. Computed tomography, axial section. Vascular window. Incision at the level of basal segments
a. Incision at the level of the main arteries of the lung
b. Thrombotic masses are reflected at different levels in the bilateral pulmonary arteries. Areas of infarction-pneumonia are detected against the background of the right basal infiltration.

Echocardiographic findings of RV overload and/or dysfunction not detected, but was revealed left ventricle disfunction, EF -20 %,. RV dilation was not found on transthoracic echocardiography (TTE). The combination of a pulmonary ejection acceleration time (measured in the RV outflow tract) with a peak systolic tricuspid valve gradient was not present. PASP -40 mm.Hg. “Buble” test was negative.
Pulmonary Embolism Severity Index (PESI) to assess a patient’s overall mortality risk and early outcome, was >125 points (Class V), was identify of very high mortality risk(10-24.5%)

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.Haemodynamic instability(pressure ,supporting by norepinephrine), combined with PE confirmation on CTPA was sufficient to classify a patient into the high-risk PE category, but calculation of the PESI and measured of troponins (cardiac biomarker was high) essed the patient like in high mortality risk.
Very elevated levels of D dimer have been observed, that was correlated with illness severity , like a marker of PE ,infectious and inflammatory diseases .
Venous thromboembolism (VTE) , including deep vein thrombosis was not detected .
Treatment was followed the ESC guidelines focusing on the clinical management of pulmonary embolism (PE) published in 2019
CT scan of brain was detected acute haemorrhagic infarction (Hemorrhagic transformation after cerebral infarction) in the right parietal lobe. There was a hypodenseous zone 5-6 cm, with blood-density inserts in the cortex and the phenomenon of periventricular luminescence, without displacement of the middle structures. Picture of cortical venous thrombosis and venous infarction in the right parietal lobe of the brain. Leukomalacia, leukoencephalopathy, cortical atrophy. Figure 3.

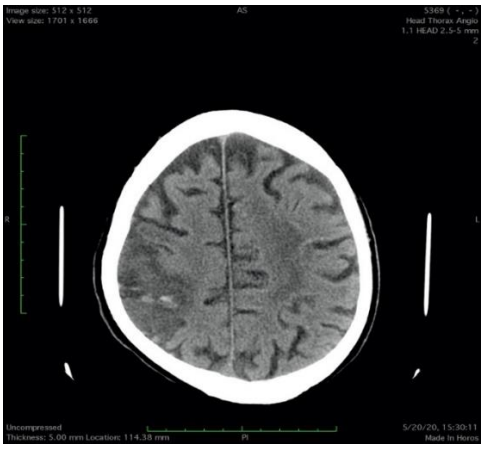
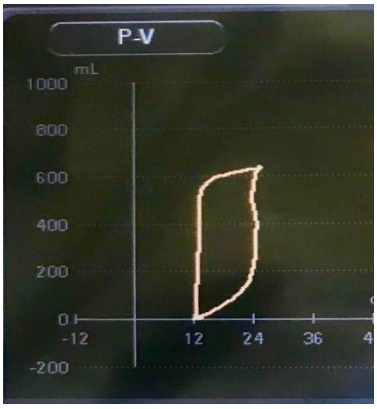


Figure 3
CT scan of brain was detected acute haemorrhagic infarction (Hemorrhagic transformation after vein cortical thrombosis and cerebral infarction) in the right parietal lobe.

Initial level of D dimer was high -20 mkg/ml ,Hs Troponin --24 ng/ml, Ferritin—430 ng/ml, IL-6—28.24 mkg/l, CRP-70mg/L PaO_2/FiO_2 <150 , patient was ventilated with DUOLEVEL mode and High PEEP-- 12 cm.H_2O , compliance C dyn -48ml/cm H_2O ,P plat -22 cm.H_2O



Laboratory finding:

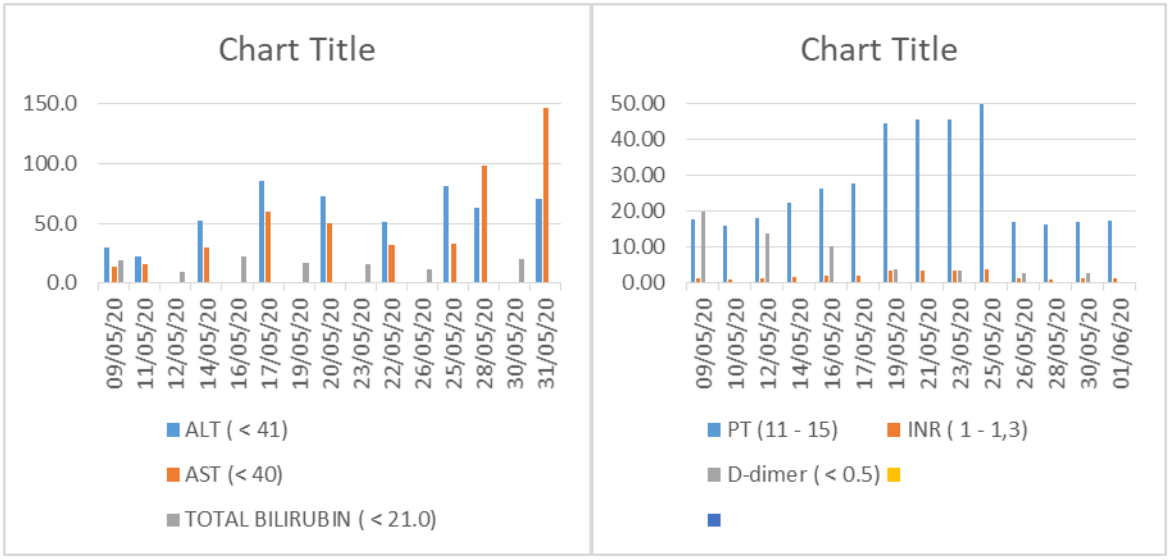


Table 1

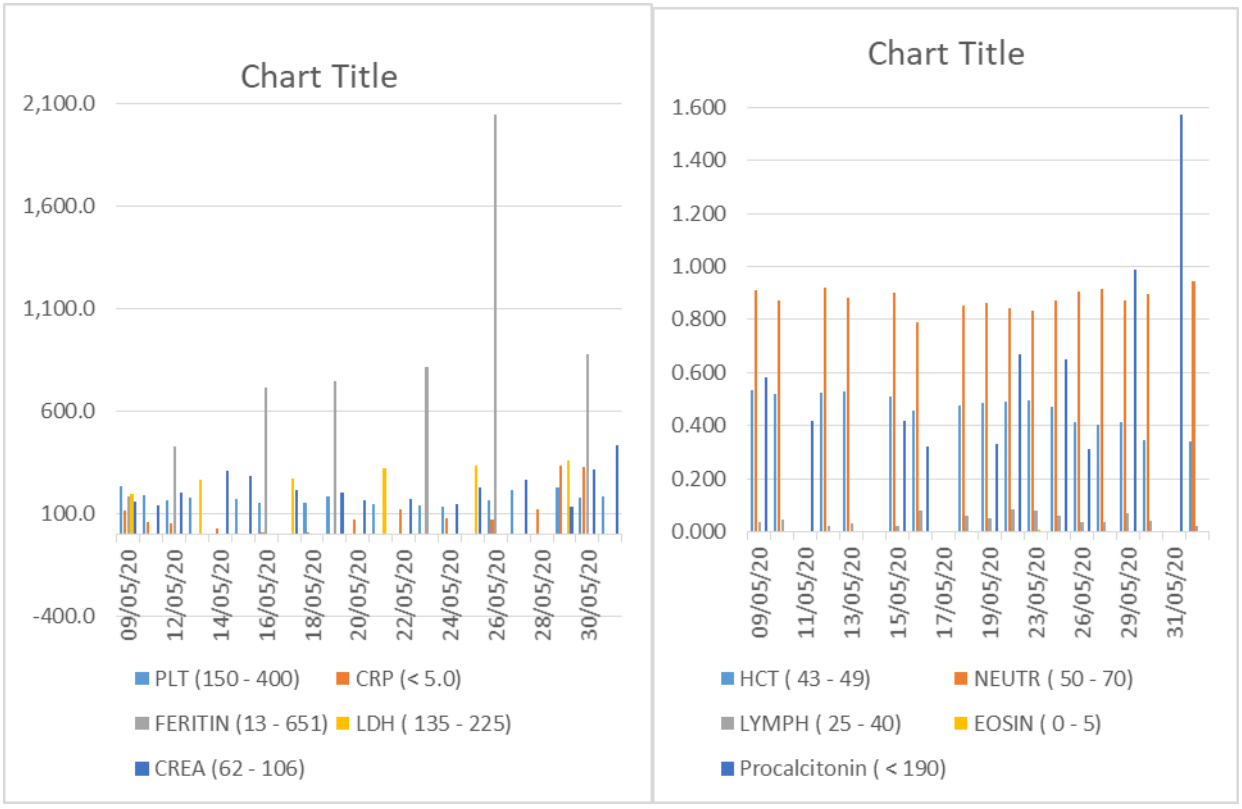


Table 2

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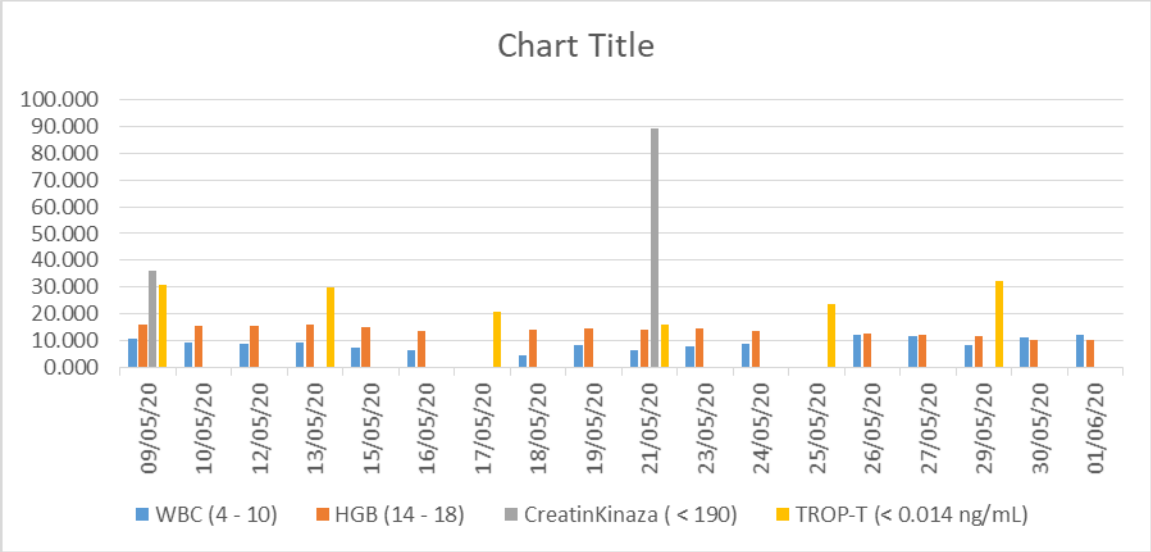


Table 3

Patient state was improuved. On the CT scan of brain was observed Blood density areas reduction In right parietal lobe .The density of haemorrhagic area is reduced(- positive X-ray dynamic). Fig.4

Figure 4

In the trunk of the pulmonary artery and in the main arteries a thrombus doas not revealed (Fig 5), but The volume of extensive inflammatory changes was reduced with thickening of interlobal pleuras.

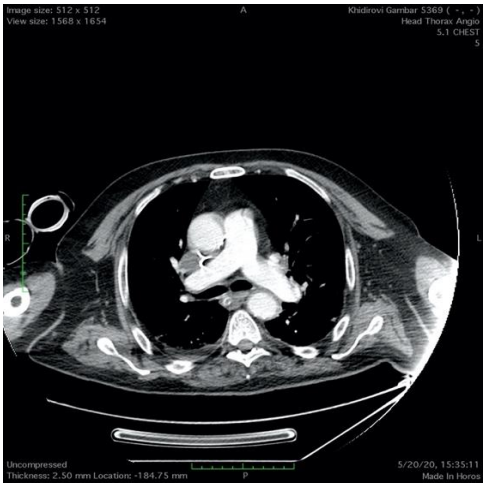
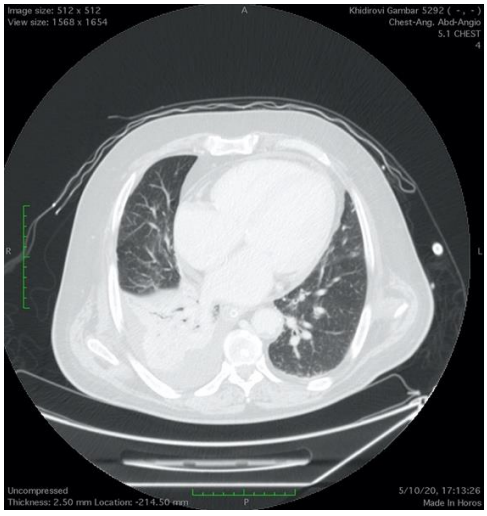


Figure 5

Thrombotic masses are no longer reflected in the lumen of the bilateral main artery in the pulmonary trunk. Against the background of the existing consolidation, a small triangular avascular zone is revealed.
Extensive consolidating infiltrative changes in the lower right part are reduced, it is observed the interlobar pleura is thickened on the same side, bronchiectasis in the upper part and bullous changes in the apex, mixed infiltrative changes in the middle lobe. The infiltration volume of the upper lobe was slightly increased, bilateral hydrothorax.(Fig.6)

a 

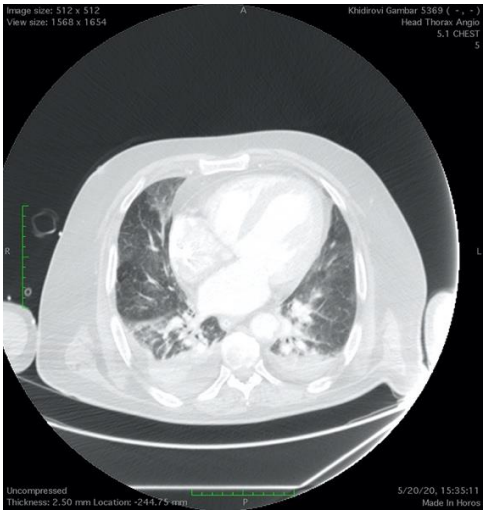
b 

Figure 6

a. In the lower part of right lung extensive inflammatory and consolidation lesions ,with airal bronchogramm.
b. The volume of extensive inflammatory changes is reduced with thickening of interlobal pleuras.

We presented case of vein embolism in the brain and in the bilateral pulmonary arteries in patient where comorbidities was different .Laboratory finding has shown changes of base parameters on different stage of illness and with correlation of disease severity(Table 1.2.3.) .
Bilateral pneumonia, systemic inflammation, endothelial dysfunction, coagulation activation, massive embolism, acute respiratory distress syndrome,coma and multiorgan failure we have described as key features of severe COVID-19 ilnes patient .
Hypothesis of the origin of Covid-19-associated pulmonary emboli and lung microcirculatory thrombotic disease: Interaction of inflammation and coagulation. active replication and release of the virus may cause the host cell to undergo pyroptosis (pro-inflammatory apoptosis) and release damage-associated molecular patterns, activating oxidant

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stress, and generating pro-inflammatory cytokine and chemokine release from nearby epithelial cells, endothelial cells and alveolar macrophages. Tissue factor, from the subendothelium, is upregulated on platelets, leucocytes and EC during inflammation, leading to activation of both the extrinsic and intrinsic coagulation pathways. Occluded small pulmonary blood vessels are likely to contain fibrin, platelets and coagulation factors, as well as neutrophils that pass through the lung.The infection initiates alveolar injury and the resulting inflammatory response, production of inflammatory cytokines, IL-6, which has been demonstrated significantly elevated in our patients, as well as activation and neutrophils causing more tissue damage, including damage to the capillary endothelium, resulting in microvascular thrombosis and VTE.

Conclusion: High values of d-dimer could be related to a higher activation of blood coagulation in COVID-19 patients secondary to a systemic inflammatory response syndrome – or as a direct consequence of the SARS-CoV-2 itself. Pulmonary thrombosis was the confluence of processes, endothelial inflammation with no evidence of DVT . Tissue factor, upregulated on platelets, leucocytes during inflammation, leading to activation coagulation pathways and promote the formation of fibrin. The profound hypoxaemia is a likely driver of vasoconstriction, inflammation and thrombosis. The origin of Covid-19-associated pulmonary emboli and lung microcirculatory thrombotic disease: Interaction of inflammation and coagulation.

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EFFECT OF METAL-CERAMIC PROSTHESIS ON GINGIVAL MUCOSA

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ABSTRACT

The fixed dental prosthesis is one of the most commonly used prosthesis in dental clinical practice for restoring function and health of oral tissues. This type of dental prosthesis is not without complications, as these restorations often extend into the gingival sulcus, and gingival epithelial cells come into contact with them. Unfortunately, they also alter and modify oral microbial flora. The aim of the present study is to identify the dynamics of changes of mucosa in the region of metallo-ceramic prosthesis. We have examined three groups of patients, according to the length of wearing time of metallo-ceramic prosthesis: I group - 1year, II group – 1-5 years and III group – 6-10 years. Each group includes two subgroup, where was studied influence of supportive and intermediate parts of Metal-Ceramic prosthesis on gingival mucosa. The gingival mucosa was examined by Papanicolaou staining and cytomorphometric indexes. A review of the literature and the results of our study demonstrated the effect of metallo-ceramic prosthesis on the dynamics of changes in the surrounding gingival mucosa. At the same time, the literature searches around the present study also showed possible reasons for the changes mentioned above. It was shown that the success of fixed dental prosthesis depends on many factors which should be considered during treatment planning. Therefore, a detailed analysis of the changes in the gingival mucosa surrounding the fixed ceramic-metal prosthesis and their possible causes are necessary prerequisites for successful prosthetics.
Key words: Fixed Metal-Ceramic prosthesis; Gingival Mucosa; Cytomorphometric Indexes;

The fixed dental prosthesis is one of the most commonly used prosthesis in dental clinical practice for restoring function and health of oral tissues. [1] Substantial proportion of dental patients worldwide use fixed metallic restorations. In Europe, for instance, Sweden reported the highest use of fixed restorations (45%) followed by Switzerland (34%). Another study reported that 12.4% of Finnish men and 12.1% of women have crowns, whereas 4.8% and 8.0%, respectively, have fixed dental prostheses.[2] This type of dental prosthesis is not without complications, as these restorations often extend into the gingival sulcus, and gingival epithelial cells come into contact with them. [3] unfortunately, they alter and modify oral microbial flora.[4]

The aim of the present study is to identify the dynamics of changes of mucosa in the region of metallo-ceramic prosthesis.

MATERIALS AND METHODS

We have examined three groups of patients, according to the length of wearing time of metallo-ceramic prosthesis: I group - 1year (12 patients), II group – 1-5 years (28 patients) and III group – 6 -10 years (20 patients). Each group includes two subgroup, where was studied influence of fixed and intermediate parts of Metal-Ceramic prosthesis on gingival mucosa. The gingival mucosa was examined by Papanicolaou staining. The status of oral mucosa was evaluated using cytomorphometric indexes: index of cells differentiation (ICD), index of keratinization (KI), index of destruction (DI) and index of inflammation-destruction (IDI). The statistical significance of differences was measured by T-test. The data were considered reliable when $p < 0.05$.

RESULT

The comparative study of cytological data between supportive and intermediate parts of prostheses in group I (diagram 1) has showed that in gingival mucosa adjacent to intermediate part of prosthesis: the index of cell differentiation (CDI) is 1,1 times less ($p>0,05$), index of keratinization (KI) is 1,5 times more ($p<0,05$), index of destruction (DI) is 2,3 times less ($p<0,05$), index of inflammation - destruction (IDI) is 1,2 times less ($p<0,05$) in comparison to supportive part. No detectable amount of bacteria was found on the surface of epithelial cells. In this group was revealed particular changes in soft tissues, including gingival edema, bleeding and pain.

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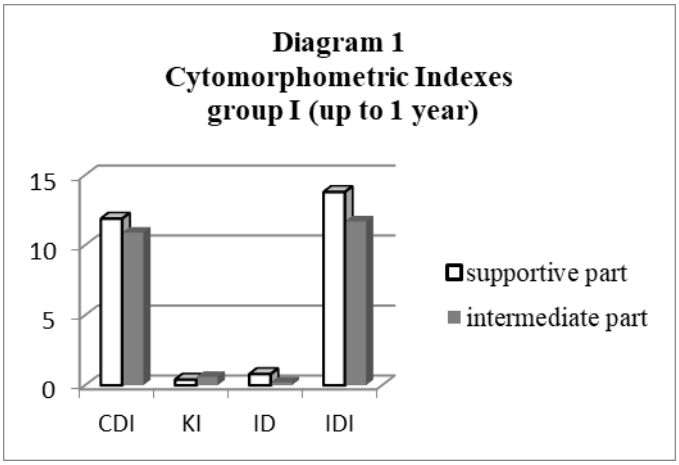
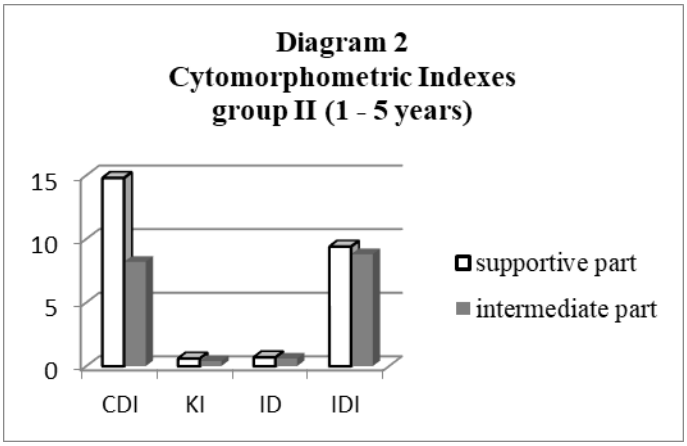
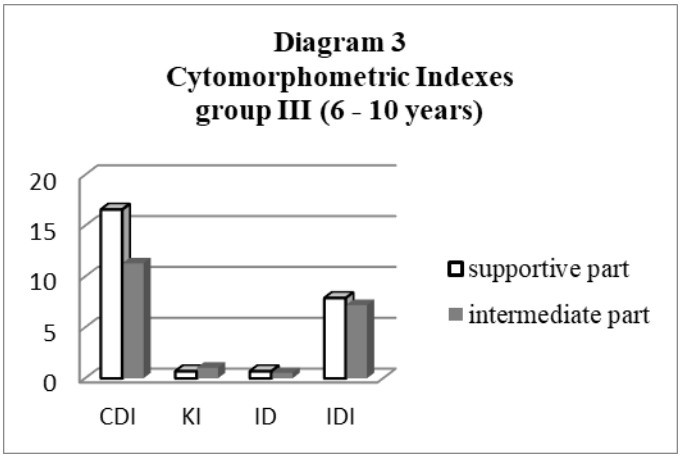


In group II (diagram 2) has showed that in gingival mucosa adjacent to intermediate part of prosthesis: the CDI is 1,8 times less (P<0,05), KI is 1,3 times less (p<0,05), DI is 1,3 times less (p<0,05) and IDI is 1,1 times less (p<0,05), in comparison to supportive part. The large number of epithelial cells was covered by bacteria. In this group was manifested following clinical symptoms: occasional bleeding, edema and pain.



In group III (diagram 3) has showed that in gingival mucosa adjacent to intermediate part of prostheses: the CDI is 1,5 times less (p<0,05), KI is 1,2 times more (p<0,05), DI is 1,3 times less (p<0,05) and IDI is 1,3 times less (p<0,05), in comparison to supportive part. The large number of epithelial cells was covered by bacteria. Clinically in this group was revealed: edema, and bad breath.



DISCUSSION

A substantial proportion of dental patients use fixed prosthodontic prosthesis in dental clinical practice for restoring function and health of oral tissues. [1;3] As mentioned above this type of dental prosthesis is not without complications, as these restorations often extend into the gingival sulcus, and gingival epithelial cells come into contact with them. [3] Mechanical trauma due to pressure and friction between appliances and tissues can also lead to local tissue reactions. [5] An important aspect of stratified squamous epithelia is that the cells undergo a terminal differentiation program that results in the formation of a mechanically resistant and toughened surface composed of cornified cells that are filled with keratin filaments and lack nuclei and cytoplasmic organelles. In these squames, the cell membrane is replaced by a proteinaceous cornified envelope that is covalently cross linked to the keratin filaments, providing a highly insoluble yet flexible structure that protects the underlying epithelial cells. [6] Hyperkeratinization is the defect of epithelial cells. Normally, these epithelial cells shed or desquamate at regular intervals. In hyperkeratinization, this process is disturbed because of an excess of keratin formation and accumulation due to lack of adequate desquamation. It occurs as a secondary reaction to chronic irritation or some infection or malignancy. Hyperkeratinization which occurs because of chronic irritation is due to higher rate of proliferation of the epithelial cells. [7] Further, corrosion may adversely influence the mechanical integrity and biocompatibility, leading to compromised esthetics, physical weakness, and health hazards.[8] Biologic nature of the oral cavity qualifies it to be an active environment for the corrosion of metallic alloys that have low mechanical and biological properties.[9] Leakage of ions will cause a wide range of biological interactions. The subsequent soft tissue response can promote the adhesion of bacteria and lead to toxic or subtoxic effects or allergic responses.[10] The adaptation of dental crowns and bridges to the supporting prepared crowns is less than perfect, always creating a gap that promotes bacterial colonization.[7] It is a well-known fact that tooth decay, gingival inflammation and periodontal disease, quoted as the most common biological complications of fixed dental prosthesis, [1] are caused by bacteria settled in the dentogingival plaque accumulated due to insufficient oral hygiene, and consequently, for oral health the appropriate hygiene regime is crucial. The relationship between bacterial plaque accumulation and gingival inflammation has been well documented. Patient's susceptibility to gingival inflammation is not based solely on the quantity of dental plaque, [1] the presence of a unique immunological system tailored for both surveillance and repair programs. The delicate balance between microbiome/tissue injury and host responses at this interface is best reflected by the fact that this homeostasis is often lost, leading to destructive inflammation; specifically the development of the common inflammatory disease periodontitis. In periodontitis, a dysbiotic oral microbiome is considered the trigger of a chronic inflammatory response in the surrounding soft tissues [11], which causes destruction of supporting tissues and structures [12;13] Also including diseases of the digestive tract, liver, and disorders of the nervous system. Thus, it is possible to assume the presence of significant metabolic shifts in the body under the influence of the studied factors. [14] This review of literature explains the results of our study. According to the our results, a high rate of index of inflammation-destruction was observed in group 1 patients. The clinical studies have showed that supportive and intermediate parts of prosthesis have caused particular changes in soft tissues, including gingival edema, bleeding and pain. Matching with no detectable amount of bacteria on the surface of epithelial cells this clinical manifestation indicates that changes is likely to be a reaction of the gingival mucosa to the prosthesis. In group 2 and 3 patients occasional bleeding, edema, pain and bad breath with the high rate of index of destruction and the large number of epithelial cells covered by bacteria indicate that the damage to the mucosa of the gingiva is not a direct consequence of prosthetis, but rather the result of adhesion of microorganisms to the epithelium in the region of prosthesis.

CONCLUSIONS

A review of the literature and the results of our study demonstrated the effect of metallo-ceramic prosthesis on the dynamics of changes in the surrounding gingival mucosa. At the same time, the literature searches around the present study also showed possible reasons for the change mentioned above. It was shown that the success of fixed dental prosthesis depends on many factors which should be considered during treatment planning. Therefore, a detailed analysis of the changes in the gingival mucosa surrounding the fixed ceramic-metal prosthesis and their possible causes are necessary prerequisites for successful prosthetics.

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ASSESSMENT OF MOVEMENT IN THE JOINT AFTER HIP REPLACEMENT WITH THE INCLUDING OF DEEP OSCILLATION IN POSTOPERATIVE REHABILITATION

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ABSTRACT

ABSTRACT

OBJECTIVE: Deep Oscillation® is an electromechanical procedure with deep therapy that allow to create a pulsed electrostatic field between the hand applicator and the processing better tissue nutrition, enhanced cellular metabolism, faster healing.
The purpose of this work is to evaluate the movement of the joint during the inclusion of deep oscillation method in standard therapy after endoprosthesis.
METHODS: We studied 52 patients from the Arena 2 rehabilitation center during the endoprosthetic rehabilitation period who underwent comprehensive treatment according to our scheme - the inclusion of deep vibrations in traditional treatment. 80 patients who were rehabilitated by traditional methods were used as control.
RESULTS: In the study group, the length of rehabilitation time was significantly reduced compared to the control group.
The frequency of patients with more than 90^0 flexions is significantly higher in the study group and the frequency of patients with 90^0 and less flexions is significantly lower.
The study group has a significantly higher incidence of patients with more than 30^0 abduction and a significantly lower incidence of those with 15^0 or fewer abduction; had a significantly higher incidence of patients with more than 15^0 adduction and a significantly lower incidence of patients with an adduction of 15^0 and less and had a significantly higher frequency of patients with more than 30^0 external rotations and a significantly lower frequency of patients with more than 30^0 external rotations.
CONCLUSION: Involvement of deep oscillation in the rehabilitation program after hip joint arthroplasty, reduces the timing of rehabilitation and increases the parameters of movement in the joint
Keywords: deep oscillation, hip arthroplasty, movement in the joint.

Background: DEEP Oscillation® (Deep Vibration) is an electromechanical procedure with deep therapy that allow to create a pulsed electrostatic field between the hand applicator and the processing better tissue nutrition, enhanced cellular metabolism, faster healing.
The purpose of this work is to evaluate the movement of the joint during the inclusion of deep oscillation method in standard therapy (complex rehabilitation) after endoprosthesis.

Methods: From January, 1st 2018 until December, 31st 2020 a total of n= 52 patients (21 men and 43 women) with a mean age of 65.4 years were enrolled in this study.
We studied patients from the Arena 2 rehabilitation center during the endoprosthetic rehabilitation period who underwent comprehensive treatment according to our scheme - the inclusion of deep vibrations in traditional treatment. Clinical data from 80 patients who were rehabilitated by traditional methods were used as control.
Both groups were treated orthopedic rehabilitation program (follow-up treatment). The Treatment spectrum included: u. a. Pain therapy procedures, strength training of the muscles that guide the hip joint, coordination exercises, including manual medical treatment techniques, Ergometer training, occupational therapy, medical training therapy and physical Therapy. In addition to the appropriate supply of aids orthopedic shoe adjustments were also made if necessary.
In experimental group the additional DEEP OSCILLATION® treatment was carried out with portable devices "DEEP OSCILLATION® PERSONAL" (Physiomed, Schnaittach /Laipersdorf, Germany) by Hand applicator. The Individual treatment lasted 18 minutes and was done once daily, in total in 15 to 20 Units performed. Here came a treatment program with the frequencies 160 Hz (8 min) and 60 Hz (10 min) for Application that had been preprogrammed on special treatment cards. The standardized treatment on operated leg was done in the direction of movement of a lymphatic drainage.

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Kinesetherapy program including positional treatment of the operated leg, aiming anti-edema effect, passive and active musculoskeletal exercises and joint mobilization techniques to strengthen the muscles of the thigh and gluteal muscles, as well as to increase the volume of movement in the hip joint. Functional medical gymnastics, including sitting training and getting up from a sitting position.

Statistical analysis: The Statistical significance was defined as a p value of <0.05. Data were analyzed using the SPSS 23.
Results: There is no reliable difference between the sexes and age groups.
In the study group, the length of rehabilitation time was significantly reduced compared to the control group.
The frequency of patients with more than 90^0 flexions is significantly higher in the study group and the frequency of patients with 90^0 and less flexions is significantly lower.
The study group has a significantly higher incidence of patients with more than 30^0 abduction and a significantly lower incidence of those with 15^0 or fewer abduction; had a significantly higher incidence of patients with more than 15^0 adduction and a significantly lower incidence of patients with an adduction of 15^0 and less and had a significantly higher frequency of patients with more than 30^0 external rotations and a significantly lower frequency of patients with more than 30^0 external rotations.

Conclusion: Involvement of deep oscillation in the rehabilitation program after hip joint arthroplasty, reduces the timing of rehabilitation and increases the parameters of movement in the joint

აბსტრაქტი
ნაშრომის მიზანია სახსარში მოძრაობის შეფასება ენდოპროტეზირების შემდგომ სტანდარტულ რეაბილიტაციაში ღრმა ოსცილაციის მეთოდის ჩართვის შემდეგ.
მეთოდები
შევისწავლეთ 52 პაციენტი „სარეაბილიტაციო ცენტრის არენა 2-ის“ კონტინგენტიდან ბარძაყის სახსრის ენდოპროტეზირების შემდეგ, რეაბილიტაციის პერიოდში, რომლებმაც გაიარეს კომპლექსური მკურნალობა ჩვენი სქემის მიხედვით - ტრადიციულ მკურნალობაში ღრმა ოსცილაციის ჩართვით. საკონტროლოდ გამოიყენებოდა 80 პაციენტის კლინიკური მასალისა, რომლებსაც რეაბილიტაცია ჩაუტარდათ ტრადიციული მეთოდით.

მკურნალობის სპექტრი მოიცავდა: ანესთეზიის პროცედურებს, თეძოს სახსრის კუნთების ძალის ვარჯიშს, საკოორდინაციო ვარჯიშებს, ერგომეტრზე ვარჯიშს, სამედიცინო ფიზკულტურას და ფიზიოთერაპიას.
ექსპერიმენტულ ჯგუფში ჩატარდა დამატებითი DEEP OSCILLATION®-ით მკურნალობა პორტატული DEEP OSCILLATION® PERSONAL მოწყობილობების გამოყენებით. ინდივიდუალური მკურნალობა გრძელდებოდა 18 წუთის მანძილზე და ტარდებოდა დღეში ერთხელ - ყოველდღიურად, 15-დან 20 ერთეულამდე. გამოიყენებოდა სამკურნალო პროგრამა, რომელიც წინასწარ იყო დაპროგრამებული სპეციალურ სამკურნალო ბარათებზე. სიხშირე შეადგენდა 160 ჰერცს (8 წუთი) და 60 ჰც (10 წუთი), ნაოპერაციები ფეხის სტანდარტიზებული მკურნალობა ჩატარდა ლიმფური დრენაჟის მოძრაობის მიმართულებით.
კინეზოთერაპიის პროგრამა მოიცავდა ნაოპერაციები ფეხის მკურნალობას შეშუპების საწინააღმდეგოდ, კუნთოვანი სისტემის პასიური და აქტიური ვარჯიშებისა და სახსრების მობილიზაციის მეთოდებით, კუნთების გასაძლიერებლად, აგრეთვე თეძოს სახსარში მოძრაობის დიაპაზონის გასაზრდელად.

შედეგები
ძირითად ჯგუფში, საკონტროლო ჯგუფთან შედარებით სარწმუნოდ შემცირდა რეაბილიტაციის ხანგრძლივობა - 4.4 და 7.9 კვირა შესაბამისად ($p < 0.05$).
ოსცილაციის ჯგუფში საკონტროლოსთან შედარებით სარწმუნოდ ნაკლებია 45^0-ზე ნაკლები ფლექსიის მქონე პაციენტების სიხშირე - შესაბამისად 3.84% და 20.00%, და მაღალია 110^0-ზე მეტი ფლექსიის სიხშირე შესაბამისად 25% და 8.75%
ძირითად ჯგუფში საკონტროლოსთან შედარებით აღინიშნა იმ პაციენტების სარწმუნოდ მაღალი სიხშირე, რომელთაც აქვთ 30^0-ზე მეტი აბდუქცია - 46.15 და 37.50 და იმ პაციენტთა სარწმუნოდ დაბალი სიხშირე, რომელთაც აღენიშნათ 15^0-ზე ნაკლები აბდუქცია - 26.92% და 10.00%,. ძირითად ჯგუფში, გამოვლენილია პაციენტთა სარწმუნოდ მაღალი სიხშირე, რომელთაც აქვთ 15^0-ზე მეტი ადდუქცია - 28.85% და 52.50% და იმ პაციენტთა სარწმუნოდ დაბალი სიხშირე, რომლებსაც აქვთ 15^0 -ზე ნაკლები ადდუქცია შესაბამისად 71.15 და 47.50აგრეთვე 30^0 – ზე მეტი გარე როტაციის მქონე პაციენტების მნიშვნელოვნად მაღალი სიხშირე 32.69 და 56.25 და 30^0 -ზე ნაკლები გარე როტაციის მქონე პაციენტების მნიშვნელოვნად დაბალი სიხშირე, ვიდრე საკონტროლო ჯგუფში - შესაბამისად 67.31და 43.75.

დასკვნა: მენჯ-ბარძაყის სახსრის ენდოპროტეზირების შემდგომი რეაბილიტაციის პროგრამაში ღრმა ოსცილაციის ჩართვა, ხელს უწყობს რეაბილიტაციის პერიოდის შემცირებას და სახსარში მოძრაობის პარამეტრების გაუმჯობესებას.

РЕЗЮМЕ

Целью данной работы является оценка движения сустава при включении метода глубоких колебаний в стандартную терапию (комплексная реабилитация) после эндопротезиоования тазобедренного сустава.

Методы: Под нашим наблюдением находились 52 пациента из контингента реабилитационного центра в течение периода реабилитации после операции эндопротезирования тазобедренного сустава, которые прошли комплексное лечение по нашей схеме - с включением глубоких колебаний в традиционное лечение. В качестве контроля использовали клинический материал 80 пациентов, которые были реабилитированы традиционными методами.

Спектр лечения включал: Процедуры обезболивания, силовая тренировка мышц, управляющих тазобедренным суставом, координационные упражнения, в том числе мануальные методы лечения, тренировка на эргометре, медицинская физкультура и физиотерапия. В дополнение к соответствующей поставке вспомогательных приспособлений, при необходимости, также вносились коррективы в ортопедическую обувь. Программа Kinesetherapy включая позиционную обработку оперированной ноги, направленный против отеков, пассивные и активные упражнения опорно-двигательного аппарата и совместных методов мобилизации для укрепления мышц бедра и ягодичных мышц, а также для увеличения объема движения в тазобедренный сустав. Функциональная лечебная гимнастика, в том числе сидячая тренировка и вставание из сидячего положения.
В экспериментальной группе дополнительная обработка DEEP OSCILLATION® проводилась с помощью портативных устройств «DEEP OSCILLATION® PERSONAL» (Physiomed, Schnaittach / Laipersdorf, Германия) с помощью ручного аппликатора. Индивидуальное лечение длилось 18 минут и проводилось один раз ежедневно, всего от 15 до 20 исполняемых единиц. Использовали программу лечения с частотами 160 Гц (8 минут) и 60 Гц (10 минут) для приложения, которое было предварительно запрограммировано на специальных картах лечения. Стандартизированное лечение оперированной ноги проводилось в направлении движения лимфодренажа.

Результаты: В основной группе продолжительность реабилитации значимо сократилась по сравнению с контрольной группой – соответственно 5.4 и 7.9 недели($p<0.05$).
Частота пациентов с более чем 90^0 флексией значительно выше в основной группе, а частота пациентов с 90^0 и менее - значительно ниже.
В основной группе отмечается значимо высокая частота пациентов с более чем 30^0 абдукцией и значимо низкая частота пациентов с аддукцией менее 15^0, чем в контрольной группе. В основной группе выявили значимо высокую частоту пациентов с более чем 15^0 аддукцией и значимо более низкую частоту пациентов с аддукцией 15^0; и значимо высокую частоту пациентов с более чем 30^0 внешней ротации и значимо низкую частоту пациентов $>30^0$ внешней ротации.

Вывод: Включение глубоких колебаний в программу реабилитации после эндопротезирования тазобедренного сустава, сокращает срок реабилитации и увеличивает параметры движения в суставе.

INTRODUCTION

Joint arthroplasty constitutes a major advance in the treatment of chronic refractory joint pain [1]. And rehabilitation is key to optimize outcomes [2,3].
DEEP Oscillation® (Deep Vibration) is an electromechanical procedure with deep therapy tools OSCILLATION® EVIDENT and DEEP OSCILLATION® PERSONAL (Physiomed, Germany) that allow to create a pulsed electrostatic field between the hand applicator and the processing better tissue nutrition, enhanced cellular metabolism, faster healing. It has anti-edema, lymphatic drainage, anti-brachial and detoxifying properties, promotes rapid healing of open wounds, alleviates pain and swelling, stimulates collagen and tissue regeneration.[4,5,6].
The electrostatic field, at the level of connective tissue, generates intense resonant vibrations, and the repetition of this phenomenon rapidly results in a rhythmic deformation of the tissue (skin, connective tissue, and muscle). The resulting effects include improved microcirculation,
It is said to be effective in damaging the brain and helping to increase its flexibility.
There is scant literature on the use of this method for further rehabilitation of the endoprosthesis of the pelvic joint.
The purpose of this work is to evaluate the movement of the joint during the inclusion of deep oscillation method in standard therapy (complex rehabilitation) after endoprosthesis.

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METHOD

From January, 1st 2018 until December, 31st 2020 a total of n= 52 patients (21 men and 43 women) with a mean age of 65.4 years were enrolled in this study.
We studied patients from the „Arena 2 rehabilitation center“ during the endoprosthetic rehabilitation period who underwent comprehensive treatment according to our scheme - the inclusion of deep vibrations in traditional treatment. Clinical data from 80 patients who were rehabilitated by traditional methods were used as control.
A non-randomized controlled trial was performed.
The research protocol has been approved by the University Ethics Committee
Both groups were treated orthopedic rehabilitation program (follow-up treatment). The Treatment spectrum included: u. a. Pain therapy procedures, strength training of the muscles that guide the hip joint, coordination exercises, including manual medical treatment techniques, Ergometer training, occupational therapy, medical training therapy and physical Therapy. In addition to the appropriate supply of aids orthopedic shoe adjustments were also made if necessary.
In experimental group the additional DEEP OSCILLATION® treatment was carried out with portable devices "DEEP OSCILLATION® PERSONAL" (Physiomed, Schnaittach /Laipersdorf, Germany) by Hand applicator. The Individual treatment lasted 18 minutes and was done once daily, in total in 15 to 20 Units performed. Here came a treatment program with the frequencies 160 Hz (8 min) and 60 Hz (10 min) for Application that had been preprogrammed on special treatment cards. The standardized treatment on operated leg was done in the direction of movement of a lymphatic drainage.
Kinesetherapy program including positional treatment of the operated leg, aiming anti-edema effect, passive and active musculoskeletal exercises and joint mobilization techniques to strengthen the muscles of the thigh and gluteal muscles, as well as to increase the volume of movement in the hip joint. Functional medical gymnastics, including sitting training and getting up from a sitting position.
Statistical analysis: In the assessment of quantitative indicators, we have counted an average, a standard deviation. The reliability of the differences between the groups, in case of the quantitative indicators were determined by the means of Student`s *t* test, the equilibrium of dispersions was assessed according to Levene's Test while making the comparison. We counted percent for qualitative indicators and evaluated the differences between groups by means of χ^2 (Pearson) criteria. The Statistical significance was defined as a p value of <0.05. Data were analyzed using the SPSS 23.

RESULTS

The demographic characteristics of the patients are given in Table 1

		DEEP Oscilation group N=52		Standard treatment group N=80		□2	P
		abs	%				
Sex	Women	36	69.23	33	41.25	1.16	0.282
	Men	16	30.77	47	58.75	1.16	0.282
Age	<35	10	19.23	15	18.75	0.01	0.946
	36-55	15	28.85	22	27.5	0.03	0.867
	55-75	21	40.38	34	42.5	0.06	0.81
	>75	6	11.54	9	11.25	0.003	0.96

As can be seen from the table, there is no reliable difference between the sexes and age groups
In the study group, the length of rehabilitation time was significantly reduced compared to the control group (fig.1)

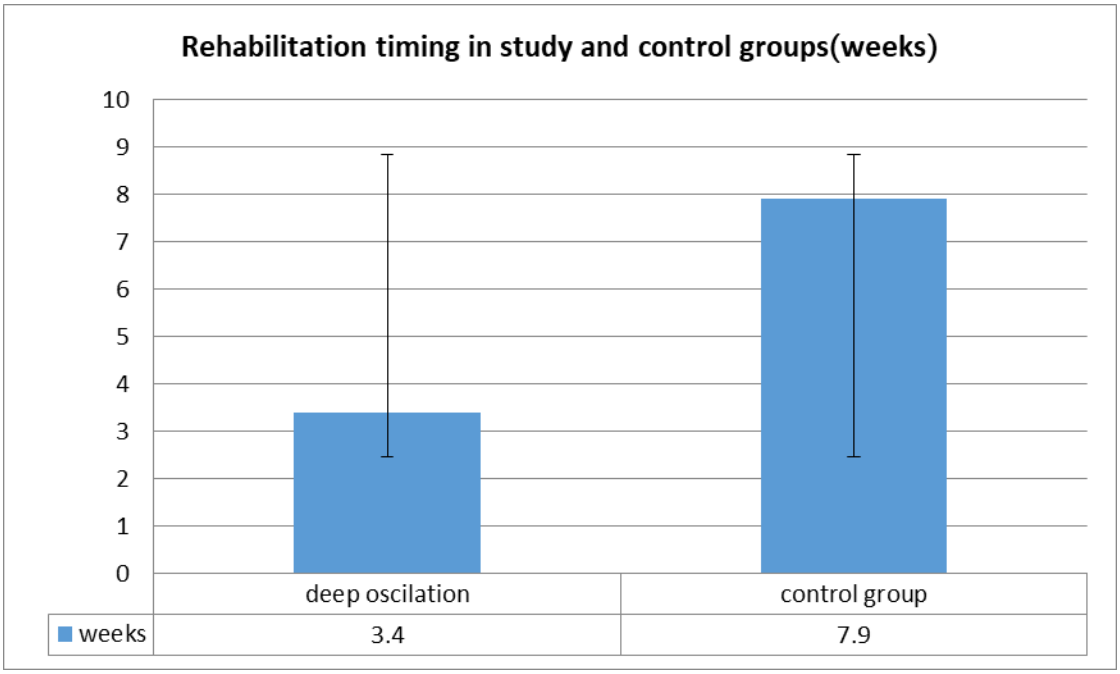

Figure 1
Enhancements movement of the joint is of particular importance during the rehabilitation process.
Our study showed that after standard DEEP Oscilation involvement in standard treatment, joint movement parameters increased (Table 1).

Table 1
Joint movement parameters after standard DEEP Oscilation involvement in standard treatment

		DEEP Oscilation group N=52		Standard treatment group N=80		□2	P
		abs	%	abs	%		
Flexion	$0\text{-}45^0$	2	3.84	16	20.00	9.18	0.003
	$45^0\text{-}90^0$	15	28.84	27	33.75	4.30	0.039
	$91^0\text{-}110^0$	22	42.30	30	37.50	4.26	0.040
	$111^0\text{-}140^0$	13	25.00	7	8.75	6.47	0.011
Abduction	$0^0\text{-}15^0$	11	21.15	39	48.75	10.20	0.002
	$16^0\text{-}30^0$	27	51.92	31	38.75	2.22	0.564
	$31^0\text{-}60^0$	14	26.92	8	10.00	6.50	0.011
Adduction	$0^0\text{-}15^0$	15	28.85	42	52.50	7.19	0.005
	$16^0\text{-}60^0$	37	71.15	38	47.50	7.19	0.008
External	$0^0\text{-}30^0$	17	32.69	45	56.25	7.02	0.009

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rotation	31^0-60^0	35	67.31	35	43.75	7.02	0.009

As we can see, the frequency of patients with more than 90^0 flexions is significantly higher in the study group and the frequency of patients with 90^0 and less flexions is significantly lower.
The study group has a significantly higher incidence of patients with more than 30^0 abduction and a significantly lower incidence of those with 15^0 or fewer abduction; had a significantly higher incidence of patients with more than 15^0 adduction and a significantly lower incidence of patients with an adduction of 15^0 and less and had a significantly higher frequency of patients with more than 30^0 external rotations and a significantly lower frequency of patients with more than 30^0 external rotations.

DISCUSSION

Arthroplasty is the most frequent amongst the interventions in orthopaedics and traumatology. Rehabilitation is the final stage of hip joint arthroplasty with great importance concerning the rate and stage of functional recovery [7]. Small accessory oscillation movements stimulate joint mechanoreceptors that assist in pain modulation while helping to maintain capsular mobility [8]. Deep Oscillation promotion of motoricity[9]. Our research has shown that the use of deep oscillation compared to the control group reliably reduces rehabilitation time and increases Flexion, Abduction, Adduction and External rotation.

CONCLUSION

Involvement of deep oscillation in the rehabilitation program after hip joint arthroplasty, reduces the timing of rehabilitation and increases the parameters of movement in the joint

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THE THEORETICAL ASPECTS OF THE EMOTIONAL INTELLEGENCE OF PRESCHOOL CHILDREN

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ABSTRACT
Based on the analysis of scientific literature, the features of the development of emotional intelligence of preschool children are considered, the concept of “emotional intelligence of preschool children” is clarified.
Keywords: preschool children, emotional development, emotional intelligence.

STATEMENT OF THE PROBLEM

In the modern society, the problem of the competence in understanding and expressing emotions is quite acute. Experts from the world economic forum in 2018 in Davos (Switzerland) listed emotional intelligence in the top of 10 most important skills in 2020. This competence was absent from the previous similar list, and this innovation is not accidental: understanding emotions and managing them are extremely important in social interaction and in the professional activity of any person.
The modern psychological research focuses on various aspects of emotional intelligence: the problem of measurement and application in practice (D.V. Lyusin, G.R. Trinidad, M. Tseydrena, etc.), situational aspects of actualization (S.P. Derevyanko, etc.), the specifics of the relationship with cognitive styles (V.V. Ovsyannikova), as a way to prevent addictive behavior (Y.V. Bratchikova, N.S. Voloshina), the relationship of psychological development of preschoolers with speech pathology, and the level of development of emotional intelligence of parents (O.A. Koval), as well as features of emotional intelligence of preschoolers with abnormal development (N.I. Kolcheva, E.I. Nikolaeva), and others. However, the concept of emotional intelligence remains insufficiently developed in scientific psychology (D.V. Ushakov).
The Federal state educational standard for preschool education defines one of the main priorities as the preservation and strengthening of the physical and mental well-being of children, including their emotional intelligence. In the section of the Federal state educational standard “Social and communicative development”, the need for the development of social and emotional intelligence, emotional responsiveness, empathy, and the formation of readiness for joint activities with peers is noted.

THE MAIN MATERIAL RESEARCH

Since emotional intelligence is important for personal development, special attention should be paid to its formation and development in preschool children. At preschool age, the child’s personality begins to form. At the same time, this process is closely interrelated with the development of the emotional sphere, with the formation of behavioral motives and interests, which is determined by the social environment, especially the typical relationships with adults at this stage of development [12].
A.V. Zaporozhets, noted the importance of studying of the emotional sphere of preschool children, in particular the emotional relationships of children. The scientist argued that “the education of feelings from the first years of life is an important task, because how knowledge and skills will be acquired depends crucially on the emotional attitude of the subject to the people who surround him, and the environment” [11, c. 97].
The famous psychologist Y. B. Gippenreiter, emphasizing the importance of emotions in childhood, emphasized that: “the mental organization of childhood is exceptionally beautiful, and this beauty and grace of childhood is due to the immediacy, the root of which lies in the predominant development of the emotional sphere. The younger the child is, the less objective significance the world around them acquires. It stands before him as his own emotions show. A child loves his mother and father not for their beauty, courage, but for their caring attitude, love, and warmth” [4, p. 45].
According to the psychologists (Y. V. Bratchikova, N. S. Voloshina [1], E.D. Giniyatullina [3], O. A. Putilova [10]), preschool age is characterized by rapid development of the emotional sphere, which affects children’s mastery of various activities and personal development of the child.
In preschool age, the emergence of emotions is associated with certain events in the life of the child, phenomena and people who surround them. Children, learning the world, experience everything they encounter: joy, grief, pleasure, indignation, delight. Everything that the child perceives, thinks about or observes, causes his emotional attitude [11].
As L. S. Vygotsky and A.V. Zaporozhets rightly pointed out, “the coordinated functioning of the emotional and mental systems, their unity can ensure the successful implementation of any form of activity” [8]. K. E. Izard wrote about this: “Emotions give energy and organize perception, thinking and action” [11, p. 38].

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As O. G. Tavstuha and L. Y. Savcheva noted: “emotions go through the path of progressive development, acquiring ever richer content and ever more complex forms of manifestation under the influence of social conditions of life and upbringing. The emotional development of a preschooler is primarily associated with the emergence of new interests, motives and needs. Social emotions and moral feelings begin to develop intensively. Changes in the emotional sphere are associated with the development of not only the motivational, but also the cognitive sphere of the individual, self-consciousness” [12, p. 211].

Preschool children are guided by emotions when choosing a way of behavior, because emotions accompany their feelings, regulate their mental activity, practical actions, and fill the world around them with beautiful and meaningful things. Thanks to emotions, childhood remains an unforgettable period of life. To emphasize this, M.N. Hudanova wrote: “Childhood memories are always memories-feelings and memories-images” [5, p. 113].

According to S.A. Trashchenkova, there are no right and wrong feelings and emotions, all of them play an important role in the life of a child. And no less important, emotions give children and adults information about their condition [10].

Positive emotions, such as joy, pleasure, trust, give children a sense of security and reliability. Thanks to these emotions, children feel that everything is in order in their world, emotions also help to acquire new experiences and repeat the already known ones. Other emotions make them feel bad, because they warn of danger and discontent. Anger means that the child has met an obstacle. Sadness reduces energy and gives you time to adapt to loss or disappointment. Fear encourages children to protect themselves. Warmth and affection tell children that they are loved and valued [2].

According to O. V. Khizhnyak, “during childhood, the characteristics of emotions (their persistence, strength, length) change due to changes in the general nature of the child’s leading activity and its motives, as well as in connection with the complication of the child’s relationship with the surrounding world. Along with the experience of pleasure or discontent, the child has more complex feelings caused by how well he performed his duties, what significance his actions have for other people and to what extent he adheres to the norms and rules of behavior” [9, p.205].

An important new fact of the emotional sphere of preschool children is the experience of the possible reaction of the mother or father to the actions and actions of the child: “What will the father say?”, “Mother will swear?”. Children’s emotions are included in the internal mechanisms of ensuring subordination of motives as an important component of them.

Underestimation of the emotional sphere of children usually leads to an exaggerated, one-sided development of someone property, first of all, it concerns intelligence, which does not allow us to better understand the features of thinking and managing its development, and does not allow us to fully understand the role of such strong regulators of child behavior as motives and emotions [7, p.57].

Insufficient level of development of the emotional sphere of preschool children causes a delay in the development of their intellectual sphere. These children are less interested in something new, their games lack a creative component, and there is no desire to communicate during play activities. Children are in the “captivity of emotions”, because they do not know how to be guided by their feelings, which determines aggression, anxiety, difficulties in communicating with friends and adults. Therefore, the child's upbringing of feelings and emotions should serve primarily to form a harmoniously developed personality, and one of the indicators of such harmony is a certain ratio between intellectual and emotional development [23].

O. Karelina’s idea that “recently we have to observe how difficult it is for children to cope with emotions, with their emotional outbursts and uncontrollability is relevant. This affects not only children, but also the close people who surround them. After all, emotions affect all spheres of human life, including the learning process” [8, p. 56].

Features of emotions during preschool childhood are manifested as a result of changes in the child’s activity and the complexity of his relationship with the environment.

4-5 years old children begin to form a sense of duty. Intensive development of curiosity contributes to the development of surprise, joy of discovery [7]. At the same time, children have a very developed imagination, and it is quite natural that they experience so-called age-related fears at different periods of their development. A wide variety of objects, even very safe ones, can cause them to feel fear.

For example, specific fears appear at the end of early age (by 2-3 years). O.G. Tavstukha and L. Y. Shavshayeva believe that “this period indicates the existence of a strict relationship between the child’s intellectual level and fears: the higher the child’s intelligence, the more specific fears he experiences, that is, in this case, fear has a protective function associated with the child’s ability to anticipate the consequences of this situation [12, p.212].

A characteristic feature of children of younger preschool age, as in early childhood, is that over all aspects of the child’s life there are strong emotions (affects), significant emotional excitability, intemperance and instability of emotions.

In the middle of preschool age, the emotional sphere continues to develop, it becomes more stable, negativity, stubbornness and aggression can be manifested in unfavorable relationships with adults or peers. At this age, the child does not yet appreciate the complexity of the task that faces him, it is important that he coped with them, and he was praised by adults, but children are important not for one-time, but for permanent success. By comparing their results with the results of other children, the child learns to correctly assess their capabilities, they form a level of claims, and develop an internal position. The child begins to evaluate himself as a good or bad boy or girl [5, p. 115].

A feature of children of senior preschool age is that they form an emotional prediction that makes the child worry about possible results of activities, predict the reaction of other people to their actions. Therefore, the role of emotions in the child's activity changes significantly. If earlier the child felt joy from the desired result, now he is happy that he can get this result. Gradually, older preschool children begin to anticipate the emotional results of their activities. The child learns the highest forms of expression – the expression of feelings through mimicry, pantomime, intonation, which helps him to understand the experiences of another person, "discover them for himself", it is at preschool age [5, p. 64].
It should be noted that changes in the emotional sphere of the child's personality are associated with their self-knowledge. The inclusion of speech in the emotional processes of preschoolers ensures their intellectualization, they become more aware and generalized. Consequently, the older preschooler to a certain extent begins to control the expression of their emotions, through speech. A particularly striking example is the expression of emotions related to organic needs (hunger, thirst), which cause him to act impulsively.
The development of communication with adults and peers, the emergence of forms of collective activity and, mainly, story-role play contribute to the further development of empathy, empathy, and the formation of sociability. Higher feelings are intensively developed: moral, aesthetic, and cognitive. The source of humane feelings is the relationship with loved ones. If in early childhood the child was mainly the object of feelings on the part of an adult, the older preschooler turns into a subject of emotional relationships, empathizing with other people. A child, when committing a worthy act, feels pleasure, joy – and discontent, grief, when he himself violates the generally accepted requirements, commits unworthy acts [6, p. 43].
Older preschool children tend to communicate and need a positive assessment from adults, revealing their abilities to their peers. Recognition of adults, children cause a happy mood. If the child does not find a response from close people, then his mood deteriorates, he becomes irritated, sad or annoying, with frequent outbursts of anger or attacks of fear. This indicates that his social need is not met. And then you can talk about the emotional distress of the child, which is understood as a negative emotional well-being.

CONCLUSIONS

The specific features of the emotional development in the preschool years are: the development of social forms of expression of emotions and feelings; the changing role of emotions in activities, the formation of emotional care; the formation of the higher feelings, – moral, intellectual, aesthetic; the ability to anticipate emotional outcomes of its activities; the transformation of the preschooler in the subject of emotional relationships, empathy for other people.
Based on the theoretical analysis, "emotional intelligence of preschool children" is understood as a stable child's ability to distinguish between emotional states (their own and those of their interlocutors), indicators of which are: the brightness of the child's expression of emotions, the ability to experience positive and negative emotions of the interlocutor (regardless of gender and age), the child's ability to empathy (the presence of empathic sensitivity), the child's ability to recognize their own positive and negative emotions, analyze them, to draw insights and actions for a variety of everyday situations. This demonstrates the close relationship between the development of human emotions and their intelligence, therefore, we can say that emotional development is the basis, one of the determining factors in the formation of emotional intelligence of a person.

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ASSOCIATION OF BLOOD GROUP AB0 WITH CORONARY ARTERY DISEASE IN YOUNG ADULTS IN GEORGIAN POPULATION

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ABSTRACT

OBJECTIVE: Several reports have suggested that ABO blood group system is associated with the risk of CAD.

Aim: establish the association of blood group AB0 with CAD in young adults in Georgian population.

METHODS: Under our observation were 107 patients with ischemic heart disease, aged 18-45 years, From the St. John The Merciful Private Clinic contingent. Examination: anamnesis, cardiography, echocardiography, coronography, blood lipid metabolism.
We used the distribution of blood groups in the general population of Georgia as a control
The differences between the frequency of ABO blood groups in CAD patients and healthy blood donors were tested using χ^2-test.

RESULTS: We studied the role of genetic predisposition in the development of cardiovascular disease in the Georgian population under 45 years of age. In 19 (21.6%) patients, early detection of ischemic heart disease (under 45 years of age) CVD was observed in first degree relatives.
Blood group 0 shows significantly associations with the early development of cardiovascular disease, frequency 0 antigen in CAD group - 74.77%, in population - 50.86%($p<0.0001$).
In case of group 0, the incidence of dyslipidemia is significantly high, then in group with A antigen – Respectively 38(46.91%) and 5(20.83), p=0.0224. In the case of group 0, compared to group A, significantly increased: the mass index -32.05±5.44 and 29.38±4.20 p=0.0140 respectively, Tchol - 5.24±1.30 and 4.62±1.00, p=0.0180 and TG - 2.84±1.57 and 1.83±0.70, p=0.0029, the mean LDL is significantly low - 1.27±0.48 and 1.20±0.28, p=0.3602.
The 10-year risk is significantly higher in patients with blood type 0 4.46±3.15, than in group A - 2.42±2.45, p=0.0044

CONCLUSIONS: blood group 0 increased risk fatal cardiovascular disease in young Georgian population;
Study of blood groups during coronary heart disease will help to clarify the prognostic factors of the disease and reduce the global burden of cardiovascular disease.
Keywords: AB0, risk factors CAD, dyslipidemia.

INTRODUCTION

Coronary artery disease (CAD) is a common clinical problem. The risk factors include familial and genetic factors, and the presence of other disease entities. There is a consistent association between certain risk factors and the subsequent development of CAD. Several reports have suggested that ABO blood group system is associated with the risk of CAD[1].
The *ABO* gene is located on chromosome 9q34 with 3 variant alleles (A, B, and 0), which encodes glycosyltransferases with different substrate specificities and determines blood type[2].
Blood groups vary according to populations, as well as different associations between diseases and blood groups.
Association between AB0 blood group and severity of coronary artery disease in unstable angina, Compared to the non-0 groups, the 0 group had more severe coronary artery involvement (p= 0.004)[3].
Analysis did not show any significant difference between the frequency of AB0 blood groups in coronary artery disease patients compared to the Iranian general population, moreover, the prevalence of major risk factors was equal in

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patients with different blood groups, and blood groups had no impact on development of premature coronary artery disease in individual subjects[4].
Blood group A is an independent risk factor for CAD and MI in young people in Taiwan.
Group non-0 is associated with increased mortality in patients with ischemic heart disease. Group non-0 increases the risk for cardiac death in non-elderly patients, particularly in younger females, and groups A and B prevail in myocardial infarction. AB0 group determination might aid in genetic screening for ischemic heart disease and become relevant in the management of risk factor control[5].
No association between AB0 blood groups and the extent of coronary atherosclerosis in Croatian CAD patients is observed. Observation that AB blood group might possibly identify Croatian males at risk to develop the premature CAD has to be tested in larger cohort of patients[6].
Premature coronary artery disease is characterized by an unfavourable lipid profile, low concentrations of HDL-C and high triglyceride levels, in association with high Lp(a) and a hypercoagulable state (high fibrinogen and D-dimer levels)[7].
The aim of our research is to establish the association of Blood Group AB0 with Coronary Artery Disease in Young Adults in Georgian population

METHODS

Under our observation were 107 patients with ischemic heart disease, aged 18-45 years, patients From the St. John the Merciful Private Clinic**.** Research methods: taste, anamnesis, cardiography, echocardiography, coronography. patients were alse diagnosed with blood lipid metabolism.
We used the distribution of blood groups in the general population of Georgia as a control[8].
Statistical analysis:
In estimating the quantitative indicators, we considered the mean, mean square deviation. In case of quantitative indicators, we determined the reliability of the difference between the groups by using the student t criterion. For qualitative indicators, we calculated the average frequency, the mean square deviation. We assessed the difference between the groups using the F (Fisher) criterion. The differences between the frequency of ABO blood groups in CAD patients and healthy blood donors were tested using χ^2-test.
The difference was considered significant when $p < 0.05$.
Statistical analyses were performed using the Statistical Package for Social Sciences (SPSS) for Windows, version 23.0 (SPSS Inc., Chicago, Illinois, USA)
RESULTS
We studied the role of genetic predisposition in the development of cardiovascular disease in the Georgian population under 45 years of age. In 19 (21.6%) patients, early detection of ischemic heart disease (under 45 years of age) CVD was observed in first degree relatives.
The study of AB0 blood isoantigens showed that the frequency of group 0 is high in both the study group and the control group, however, group 0 shows significantly associations with the early development of cardiovascular disease (table 1).

Table 1. Distribution of blood groups in patients with CVD and control

		0	A	B	AB	□□(0/A)	□□(0/A+B+AB)
Group I	N	80	25	2	0	14.11,	24.88,
	%	74.77	23.36	1.87	0.00	p<0.001	p<0.001
Group II	N	713	529	143	17		
	%	50.86	37.73	10.20	1.21		

In the next stage of the study, we compared the cardiovascular risk characteristics by blood groups 0 and A (Table 2).

Table 2. Evaluation of cardiovascular risk characteristics according to blood groups 0 and A.

	Blood group 0 N=81	Blood group A N=24	t or F	P
	Mean± Std. Dev. or n(%)	Mean± Std. Dev. or n(%)		
Hypertension	53(65.43%)	15(62.50%)	0.07	0.7941
Diabetes mellitus	11(13.58%)	0(0.00%)	3.70	0.0572
Dyslipidemia	38(46.91%)	5(20.83)	5.38	0.0224
Age of disease manifestation	34.31±6.93	34.88±5.67	-0.41	0.6858
Mass index	32.05±5.44	29.38±4.20	2.55	0.0140
Tchol mm / l	5.24±1.30	4.62±1.00	2.45	0.0180
TG	2.84±1.57	1.83±0.70	3.05	0.0029
LDL	3.30±1.34	2.71±0.97	2.37	0.0218
HDL	1.27±0.48	1.20±0.28	0.92	0.3602
INR	1.13±0.40	1.09±0.29	0.53	0.5984
Prothrombin index	97.91±10.69	97.20±11.83	0.26	0.7971
Fibrinogen concentration	368.33±114.75	397.48±139.45	-0.86	0.3983
Troponin ng / ml	91.93±123.49	35.78±86.73	1.80	0.0763
Serum creatinine mmol / l	101.73±69.88	98.70±54.06	0.15	0.8801
TSH	1.55±1.29	1.93±1.30	-1.21	0.2335
Glucose	5.05±2.62	4.91±1.16	0.25	0.8038
Assessment of 10-year risk of fatal cardiovascular disease/accident with SCORE	4.46±3.15	2.42±2.45	2.92	0.0044

In case of group 0, the incidence of dyslipidemia is significantly high, then in group with A antigen. diabetes is found only in case of group 0, no significant difference was found in hypertension.
In the case of group 0, compared to group A, significantly increased: the mass index, Tchol and TG, the mean LDL is significantly low.
No significant differences were found between the groups according to the mean values of INR, Prothrombin index, Fibrinogen concentration, Troponin, Serum creatinine, TSH and Glucose.
The 10-year risk of fatal cardiovascular disease / accident with SCORE is significantly higher in patients with blood type 0 than in group A.

DISCUSSION

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Omidi N et al. showed that patients with blood group 0 had more severe form of coronary involvement[3]. In study Wu et al., based upon 19 studies, group A was associated with a similar increase in MI risk (OR = 1.29, 95% CI = 1.16– 1.45, p < 0.00001) to that observed with non-A[9]. Ba DM, et al. suggests an association between blood group A and ID in sub-Sahara Africans. [10]
Our study showed that 0 group significantly increased the risk CAD in young adults Georgian population.
Disruption of the triglyceride ratio is an indicator of an atherogenic lipid profile and poses a risk of developing coronary heart disease. [11]
Biswas et al. showed that blood group 0 was associated with low HDL-C level, which was the same as our result. Although HDL-C showed statistically significant difference between the 0 and non-0 groups [12]
According our study, In the case of group 0, the mean Tchol and TG are snnificantly increased, and the mean LDL is significantly decreased then at A group. The incidence of dyslipidemia in group 0 patients was significantly higher than in group A patients.
Data on mass index are also different. The blood group 0 showed the significant positive association with obesity[13]. However, according to Parveen N.'s research, Blood group “A” and Rhesus-D positive subjects were found to have significantly higher levels of body mass index compared to other blood types especially in males thus rendering them to higher risk of developing obesity. [14]
Our study suggests an association between blood group 0 and 10-year risk of fatal cardiovascular disease / accident with SCORE in young Georgian population.

CONCLUSIONS

- Blood group 0 increased risk fatal cardiovascular disease in young Georgian population
- Study of blood groups during coronary heart disease will help to clarify the prognostic factors of the disease and reduce the global burden of cardiovascular disease.

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PRE-IMPLANTATION GENETIC DIAGNOSIS IN THE PROGRAM OF ASSISTED REPRODUCTIVE TECHNOLOGY

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Pre-implantation Genetic Diagnosis (PGD) is the diagnosis of genetic disorders in human embryos prior to implantation into the endometrium, i.e. before the phase of transfer on the program of in vitro fertilization (IVF). A biopsy of one blastomer in an embryo that is at the cleavage stage (6-10 blastomeres) or a biopsy of the trophectoderm (the outer layer of cells) at the blastocyst stage (day 5 of embryo development) is typically performed for analysis. The main advantage of PGD is that there is no selective termination of pregnancy when it is used and the chance of giving birth to a child without any diagnosed genetic diseases is quite high [1,3,15].
There are discrepant data in literature on the effectiveness of PGD as part of the program of assisted reproductive technologies (ART) [2,6,8].
According to some studies including ASRM (American Society for Reproductive Medicine) data, application of PGD doesn't increase the frequency of pregnancies with in vitro fertilization (IVF). This may be due to imperfection of the technique of the blastomer sampling procedure or the choice of a laboratory screening method to diagnose aneuploidy and microstructural chromosomal abnormalities simultaneously in all chromosomes. The method of array comparative genomichybridization (CGH) showed high performance for clinical studies on embryo transfer within ART (69-70%). While there is the high genetic abnormalities detection rate in PGD based on many studies, the frequency of pregnancies with this method doesn't exceed 30-40% [4,7,11].
Study of the structure of embryo chromosomal disorders based on pre-implantation genetic diagnosis in the program of assisted reproductive technology as well as the impact of this procedure on the results of pregnancies is, therefore, of particular interest.

Study Materials and Methods
We studied chromosomal abnormalities of embryos in 86 females with different IVF outcomes. Pre-implantation study of the embryos was conducted by the FISH method in 42 females with positive IVF outcomes and in 44 females with negative IVF outcomes. The quality of the embryos was assessed on the third day of culture.
All female patients underwent a special examination before IVF: the hormonal panel was studied (FSH, LH, estradiol, TSH, free T3, free T4, TSH, thyroperoxidase antibodies, prolactin, progesterone, Anti-Mullerian Hormone, testosterone) and infectious status (TORCH-complex infection, STDs), papanicolau test, peripheral karyotype, determination of the vitamin D level in the blood, hysterosalpingography, hysteroscopy with pathohistological examination of endometrial biopsy material. Males underwent mandatory sperm examination with morphological indicators of spermatozoa, genetic analysis of sperm (FISN) and DNA fragmentation. The immune system of spouses and their compatibility by the 2nd class of HLA genes were also examined.
The exclusion criteria were the females with monogenic diseases and males with significant pathozoospermia. Controlled ovarian hyperstimulation was performed according to the standard antagonist protocol from day 2-3 of the menstrual cycle with preparations of recombinant follicle-stimulating hormone combined with preparations of human menopausal hormone. Ultrasound monitoring of follicle growth was performed by transvaginal ultrasonography 4-5 times during the multifollicular ovarian stimulation. When the maximum follicle of 14-15 mm was reached, a gonadotropin-releasing hormone antagonist was administered at a dose of 0.25 mg.
Oocyte retrieval was performed in 35-36 hours after the administration of ovulation trigger. Immediately after receiving oocytes and spermatozoa, their morphological assessment was performed. Morphological analysis of oocytes and spermatozoa was carried out immediately after retrieval. Mature, immature and degenerative oocytes can be retrieved by puncturing follicles. More thorough assessment of the state of oocytes can be carried out only after purification before ICSI. The first polar cell is determined in mature oocytes ready for fertilization and designated as M II in the embryological protocol [1,13].
Intracytoplasmic sperm injection was performed for all patients (ISCI method). Two pronuclei form in the normal course of fertilization in 18-20 hours after ICSI (on the 1st day). In this case, 2pn rating is assigned to them. Further development of embryo cleavage occurs within 5-6 days. The embryo quality was assessed 40-42 hours (on Day 2), 72-74 hours (on Day 3), and 20 hours (on Day 5) after fertilization. Embryo cleavage should be symmetrical and equal. Embryos of poor quality were not transferred to the uterine cavity. They were left till Day 5 and then frozen or transferred upon normal blastocyst formation [5,10,14].
It is known that embryos form a blastocyst on Day 5. The quality of blastocysts was assessed by their size from 1 to 5; by the state of the inner cell mass - from " A " to " C "and surrounding cells – trophoblast (from" A "to"C"). The best blastocysts for transfer were those of size 3-5 with the multicellular ICM and trophoblast. Further development of the

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embryo occurs in the uterus after the implantation. For successful implantation, the blastocyst must exit the surrounding pellucid zone. This process is called hatching. In case of change in the pellucid zone and difficulties in the process of self hatching, auxiliary laser hatching is used [10,12,15].
Biopsy of the embryo was performed on Day 3 after the fertilization at phase 6-10 of blastomeres and blastocytes.
The FISH (fluorescence in situ hybridization) method was used to detect numerical and structural chromosomal abnormalities. This method involves DNA-probes which are a limited-size nucleotide sequence complementary to a specific region of nuclear DNA. The probe has a “tag”, i.e. it contains a nucleotide linked to fluorophore (a molecule capable of fluorescence).
After the procedure of hybridization with the formation of a hybrid DNA-probe and DNA-target molecule, fluorescence of specific DNA sequences on chromosomes or in nuclei can be observed on the study cytogenetic preparation by means of a fluorescent microscope [9,13].
Statistical data processing was performed using an application software package SPSS statistics 17.0. The Kruskal-Wallis test was used to evaluate the significance of intergroup differences in several independent samples.
In case of two samples the Mann-Whitney U-test was used for unlinked sequences. The inserted parts of genotypes were assessed for compliance with the Hardy–Weinberg principle by the X^2 criterion in comparison with expected genotype frequencies of equilibrium distribution. The significance of differences in the incidence of qualitative characters was determined by the criterion X^2.
Findings of Study
Mean age of females was 35.5 $\pm$1.0. Infertility duration was 7.5 $\pm$5 years. The patients were comparable (p>0.005) in their etiology of infertility, anamnestic data, mass-height index, structure of previous somatic and gynecological diseases, and surgical interventions. All patients had a normal karyotype.
The results of the study on the characteristics of embryos subjected to pre-implantation diagnosis are shown in Table 1. A total of 220 embryos were subjected to pre-implantation diagnosis: 111 embryos in Group A and 109 embryos in Group B. Patients of each study group were divided into subgroups by age: under the age of 35 and over 35. In Group A, among females aged <35, the number of embryos subjected to pre-implantation diagnosis was 52 and in females aged >35 the number of embryos subjected to pre-implantation diagnosis was 59. In Group B, 48 embryos were subjected to pre-implantation diagnosis in females aged <35 and 61 embryos in females aged >35.
The study findings showed that no pathology of embryos was observed both in females aged <35 and in females aged >35 in the group with successful IVF in 69.2% and 59.3% of cases respectively. These values are statistically significantly higher than similar values in the group of females with non-effective IVF results, respectively, 41.7% (p< 0.01) and 24.6 % (p < 0.01). Embryos with abnormalities were detected statistically more often in the group with negative IVF results (67.9%) than in the group of successful IVF (36.0%, p < 0.01).
Distribution of embryos with abnormalities showed that in the group of non-effective IVF results statistically significant increase in the relative incidence of embryo pathology was observed both in females aged <35 and in females aged >35 (58.3% and 75.4% respectively), as compared with the group of females with positive IVF outcomes in the relevant age group, 30.8% (p<0.001) and 40.7% (p<0.001) respectively (Table 1).

Table 1

Characteristics of embryos subjected to pre-implantation diagnosis

Value	Group A n=42		Group Б n=44		Total n=86
	Age < 35	Age > 35	Age < 35	Age > 35	
	abc %	abc %	abc %	abc %	abc %
Total embryos subjected to PD	52	59	48	61	220
Embryo pathologies by chromosomes, No	36 69.2	35 59.3	20 41.7**	15 24.6***	106
Embryo pathologies by chromosomes, Yes	16 30.8	24 40.7	28 58.3**	46 75.4***	114
Embryo pathologies by chromosomes within groups	40 36.0		74 67.9**		114

Note: *- ** p< 0.05-0.01 as compared to Group A of the same age

In view of the fact that the frequency of viable embryos formation varies in both groups, studying the frequency and nature of pathologies of viable embryos in these groups is of great interest. Viable embryos reached 35% in the group of females with positive IVF outcomes that was statistically more than in the group of negative IVF result – 20.3% (p<0.01) (Table 2). A detailed study of the frequency of viable embryos in patients of different age subgroups showed statistically

significant high values among females aged > 35 with positive IVF outcomes (37.5%) in comparison with females of the same age with negative IVF outcomes (15.2%, p<0.05).
The study of unviable embryos frequency showed a contrary picture. Unviable embryos were observed statistically more often in females aged >35 in the group with the negative IVF outcome (84.8%) as compared to females of the same age with the positive IVF outcome (62.5%, p<0.05). Among females aged <35, there was no relevant difference in the frequency of viable and unviable embryos between the study groups.

Table 2

Features of embryos with pathologies detected by pre-implantation diagnosis

Value	Group A n=40		Group B n=74	
	Age < 35	Age > 35	Age < 35	Age > 35
	abc %	abc %	abc %	abc %
Total embryos with pathologies	16	24	28	46
Unviable embryos	11 68.75	15 62.5	20 71.4	39 84.8*
Viable embryos	5 31.25	9 37.5	8 28.6	7 15.2*
Total viable embryos within groups	14 35.0		15 20.3**	

Note: *- ** p< 0.05-0.01 as compared to Group A of the same age

The study of the paternal age effect on the embryo pathology incidence revealed a direct dependence between a chromosomal abnormality and the paternal age (Figure 1). In group A, males aged 30-35 had embryo pathology in 20.0% of cases that is statistically higher than in males aged 24-30 years with embryo pathology observed in 3.0% of cases (p<0.01). Abnormalities were observed in 40.0% of males aged 35-40 and in 50.0% of males aged >40. The detected difference in the frequency of embryos with pathologies in different age subgroups for the Group A was statistically significant (p< 0.01).
A similar trend was observed in group B. The incidence of chromosomal abnormalities in embryos increased with increasing paternal age. The highest relative incidence of chromosomal abnormalities in embryos was observed in males of the older age subgroups. In persons aged >40, 54.0% abnormal embryos were observed, that is statistically more than in males aged 35-40 with the incidence of embryo abnormalities was fixed at the level of 46.0% (p<0.05). In males aged 30-35 this pathology was reported in 25.0% that is statistically less than in males of the older age groups (p< 0.01) and in males aged 24-30 (p< 0.01) (Figure 1).

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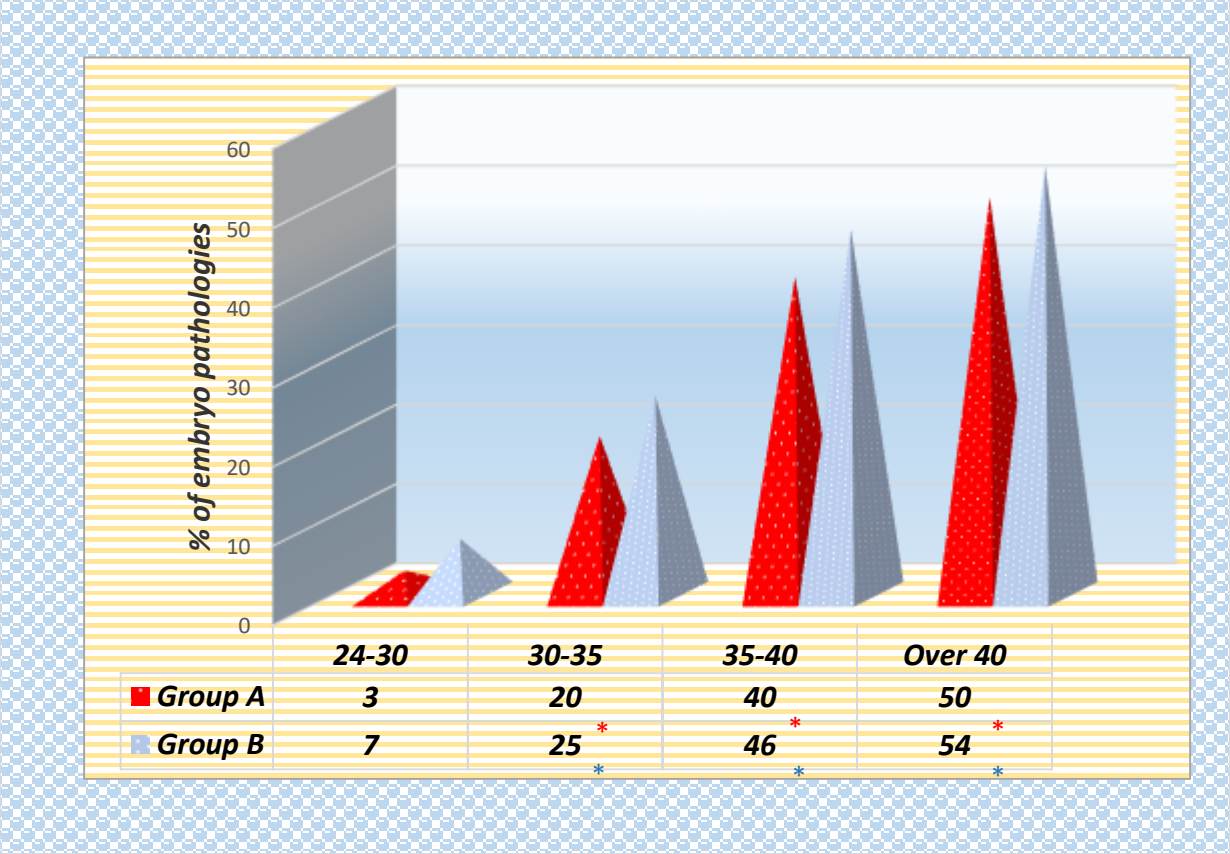
Figure 1. Dependence of the embryo pathology incidence on the paternal age in the comparison groups



P < 0.01 as compared to the previous age within each group

Comparative analysis of the embryo pathology incidence among the study groups of similar age didn't show a relevant difference.

The study of the structure of chromosomal pathology of viable embryos in the comparison groups showed the following (Table 3). In Group A, trisomy 21 (Down syndrome) was diagnosed in 41.7% of embryos. In Group B, this syndrome was reported in 40.0% of embryos (p>0.05). Patau syndrome (trisomy 13) and Edwards syndrome (trisomy 18) were diagnosed in 25.0% and 16.7% of viable embryos of Group A that is comparable to the similar data in Group B where the incidence of the above mentioned syndromes diagnosed in embryos was 20.0% and 13.3% respectively (p>0.05). There was no relevant difference between the groups in the incidence of Klinefelter syndrome (XXY) and polysomy Y (XYY) in viable embryos (p>0.05).

Table 3

Nature of chromosomal pathology in the studied pathological viable embryos

Viable embryos	Group A n=42		Group B n=44		Total	
	12 abc	%	15 abc	%	27 abc	%
Klinefelter syndrome (XXY)	0	0	1	6.7	1	3.7
Turner syndrome (X0)	1	8.3	1	6.7	2	7.4
Down syndrome (trisomy 21)	5	41.7	6	40.0	11	40.7
Patau syndrome (трисомия 13)	3	25.0	3	20.0	6	22.2
Edwards syndrome (trisomy 18)	2	16.7	2	13.3	4	14.8
Polysomy Y (XYY)	1	8.3	2	13.3	3	11.1

The study of the structure of chromosomal pathology in females of different age groups (>35 and <35) didn't reveal a relevant difference in the relative incidence of the above mentioned abnormalities (Table 4). Down syndrome was diagnosed in most cases in viable embryos both in females aged <35 and in females aged >35 (38.5% and 42.8% respectively, p>0.05). A relevant difference also was not revealed in the incidence of other syndromes in viable embryos with abnormalities in females of the experimental age groups.

Table 4

Nature of chromosomal pathology in pathological viable embryos in females of different age groups

Viable embryos	Group A + Group B				Total	
	Age <35 abc	%	Age >35 abc	%		
	13		14		27	100
Klinefelter syndrome (XXY)	1	7.7	0	0	1	3.7
Turner syndrome (X0)	1	7.7	1	7.1	2	7.4
Down syndrome (trisomy 21)	5	38.5	6	42.8	11	40.7
Patau syndrome (трисомия 13)	3	23.1	3	21.4	6	22.2
Edwards syndrome (trisomy 18)	2	15.4	2	14.3	4	14.8
Polysomy Y (XYY)	1	7.7	2	14.3	3	11.1

In summary, the study of pre-implantation embryo characteristics in the IVF program revealed higher indices for embryos without chromosomal abnormalities in the group with positive IVF outcomes and lower indices for the relative frequency of embryos with chromosomal abnormalities as against the group with negative IVF outcomes.
In females aged >35 from the group with positive IVF outcomes viable embryos were found more frequently and unviable embryos were found less frequently. The nature of chromosomal pathology in study females didn't show a relevant difference among the comparison groups.
Large enough quantity of morphologically healthy but genetically abnormal embryos was also detected. With no PGD an embryologist would undoubtedly choose the embryos that reached the blastocyst phase. And this would lead to a negative IVF outcome.
Along with this, there were also the embryos that were genetically healthy but morphologically defective. All these data suggest that the protocols of controlled ovarian hyperstimulation, used medicinal drugs, embryological phase and procedure of PGD itself need to be improved to obtain a high-quality embryo and positive IVF outcome.
So, while there are contradictory data, the analysis of the world literature data and the results obtained by us in the course of the study revealed great advantages of pre-implantation diagnosis. With its wide diagnostic capabilities, PGD as part of the ART program makes it possible to select and transfer embryos with no chromosomal abnormalities into the uterine cavity, to reduce the risk of miscarriage and multiple pregnancies and to improve the chances of successful implantation and the birth of a healthy child.

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REPARATIVE OSTEOGENESIS IN DIABETES MELLITUS

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ABSTRACT
This study is intended for systematic analysis aimed at assessing the correlation between markers of bone metabolism and bone mineral density in patients with diabetes mellitus, for early prediction of destructive changes in bone tissue. Clinically, remodeling markers and bone mineral density are independent predictors of bone changes. However, the results of the analysis showed that the measurement of bone remodeling markers is more informative in type 2 diabetes compared with x-ray absorptiometry.
Key words: diabetes mellitus; bone remodeling markers; osteopathy

INTRODUCTION

Recent studies have identified osteopathy as a serious complication of diabetes mellitus (DM), refers to secondary osteoporosis, the prevalence of which is about 30-50%, is one of the promising areas of research. Diabetic osteopathy increases the risk of fractures due to a decrease in bone strength and quality, leading to a high level of disability and mortality [1]. According to statistics, over 9 million osteoporotic fractures occur worldwide every year. The incidence of hip fractures in people with type 1 diabetes mellitus (T1DM) was 383 per 100,000, which is six times higher than the incidence of hip fractures in the general non-diabetic population. The ratio of the risk of vertebral fracture in patients with type 2 diabetes mellitus (T2DM), according to statistics, is 1.86 higher in women and 4.73 in men, compared with the general population [8].
In T1DM, as a result of insulin deficiency, bone formation slows down, while bone resorption is relatively accelerated, leading to a decrease in bone density, impaired mineralization and bone microarchitectonics [5]. Bone metabolism disorders in patients with T2DM occur somewhat differently [9]. Individuals with T2DM have a 10–30% higher risk of vertebral, hip and other bone fractures than patients without diabetes who are comparable in age [4]. Bone loss is, in part, related to age, which makes the risk higher in the geriatric population (≥65 years). The risk remains high even after adjusting for factors contributing to fall, such as sensorimotor deficits and neuropathy [2, 6]. However, the paradox of low-traumatic fractures arising in type 2 diabetes is that data on bone mineral density (BMD) in the overwhelming number of patients with type 2 diabetes, in most published studies, indicate its increase, similar to what is observed in obese subjects, but at the same time, despite the relatively increased BMD, there is a decrease in the quality of the bone, its micro- and macroarchitectonics [3, 5]. This makes it difficult to properly screen this category of patients with a high risk of developing fractures.
Recent studies show that in patients with diabetes mellitus, bone metabolism is affected by the coincidence of many factors, such as hyperinsulinemia, obesity, as well as factors that lead to increased bone resorption [7]. Effective control of the glycemic profile have great importance for maintaining bone mass in patients with diabetes mellitus [8].
The study of the pathogenetic mechanisms of bone disorders in diabetes-related risk factors for osteoporosis are important in terms of the formation of risk groups and the timely implementation of preventive measures in patients with type 1 and type 2 diabetes.

AIM

To assess the effect of changes in the body of men and women with type 1 and type 2 diabetes on the state of bone mineral density and metabolic rate. Determine the direction of changes in serum markers of bone remodeling and bone mineral density of both gender patients with this disease.

MATERIALS AND METHODS

The research was provided according to the principles of the Helsinki Declaration and was approved by the Health Research Ethics Committee of Azerbaijan Medical University. After an explanation of the aim of the study, written informed consent from each participant was received.
98 patients with T1DM (57 female and 41 male) and 137 (52 men, 85 women) with T2DM were included into the study. The average of patients with T1DM was 55.8 ± 0.7 years, with T2DM was 58.9 ± 1.5 years. Duration of diabetes was 16.6 ± 0.6 and 8.1±0.7 years, BMI was 26.07 ± 0.2 and 30±0.4 kg / m2, HBA1c was 7.4 ± 0.2% and 7.9 ± 0.6%. The nondiabetic control group consisted of 82 patients (F: 48 and M: 34, mean±SD age 55.97 ± 0.9). Investigated the parameters of phosphorus-calcium metabolism (Ca 2+, P), calcitrop hormones level: 25 (OH)D3, PTH, Calcitonin, level of bone formation markers: alkaline phosphatase (ALP), aminoterminal propeptide of procollagen type I (PINP) and

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bone resorption marker - C-terminal telopeptide (b-CTx) by the immune-enzyme analysis method. The bone mineral density (BMD) measured by DXA absorptiometry at the lumbar spine (L1-L4), proximal femur and femoral neck area.
Statistical analyses were performed with standard software package "BioStat Pro 6.2.2.0". Statistical analysis was done using unpaired parametric data analyzed by Mann—Whitney U test. Spearman's rank correlation was calculated to assess the power of connection between the parameters. For all analyses, a value of $p < 0.05$ was considered statistically significant.

RESULTS

The results of the study demonstrated that the content of serum bone remodeling markers in patients with T1DM and T2DM, in comparison to the control group, indicate pathological processes in bone remodeling with decrease bone formation marker PINP in patients with T1DM by 16%, with T2DM by 12% in comparison with the control and an increase bone resorption marker b-CTx by 32% with T1DM and in 25% patients with T2DM, of whom of women were 1,5 times more than men. Patients with T2DM had lower b-CTx values and a relatively higher level of P1NP, which reflects a less pronounced change in bone turnover compared to patients with T1DM, regardless of age and duration of disease. T-score BMD of L1–L4 area was reduced in 64 and 44% of patients with T1DM and T2DM; T-score BMD of femoral neck area— in 41 and 36% of patients (Fig.1).

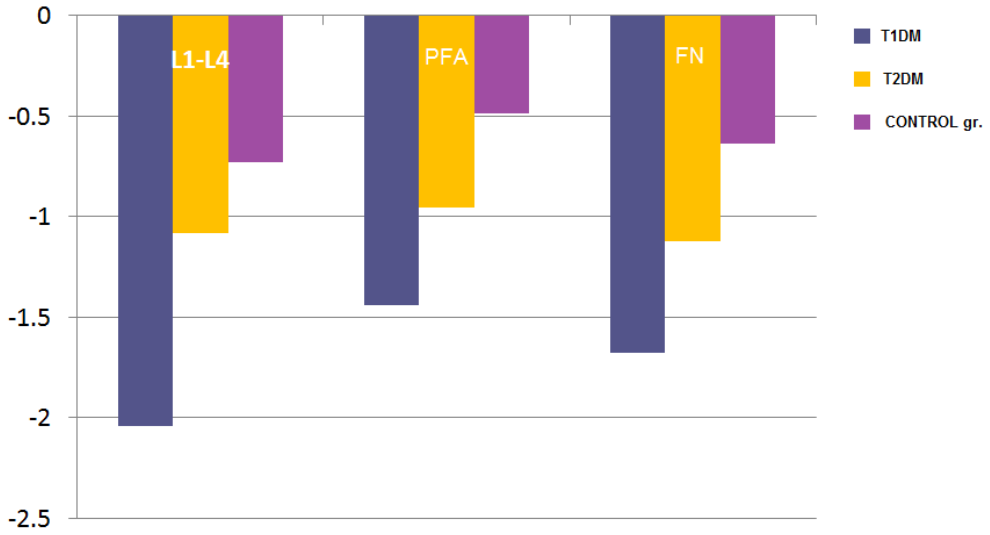

Figure 1. BMD assessment at the T-SD L1-L4, PFA and FN area in patients with T1DM, T2DM and a control group

DISCUSSION

The data has shown that females have the lowest T-score for lumbar spine and left hip, accounting for a total of 42% and 13% of the total population of patients with diabetes.It got noted that, low bone mineral density in patients with diabetes is associated with an increased bone resorption. The level of bone resorption marker b-CTx in patients with diabetes was higher in comparison with control group. Moreover, in male with T1DM, a statistically significant increase in the level of b-CTx ($p<0.05$) was observed in comparison with the control group. In T2DM, disorders of bone remodeling processes was accompanied by less significant changes in BMD.The study showed a relative increase in the concentration of b-CTx in the blood serum in patients with type 2 diabetes mellitus, which indicates bone resorptive activity. This observation indicates a slight increase in osteolysis in the considered group of patients, which may be accompanied by normal or slightly reduced bone mineral density and reflects on an increased risk of bone fractures, which is consistent with the data of a number of studies [5,8].
Authors who conduct similar studies also have showed that the bone resorption processes in patients with T2DM in most cases are within the reference values [1] or slightly increased compared to a decrease of bone formation processes [8,10], and only in a small the number of cases it can be reduced [2,7]. A slight decrease in serum P1NP levels in type 2 diabetes may be associated with inhibition of osteoblast function due to impaired insulin secretion and increased insulin resistance [10]. As the duration of diabetes increased, there was a decrease in the level of formation markers due to hyperglycemia-induced inhibition of osteoblastic function. Apparently, an increase in blood glucose levels suppresses bone formation and increases markers of bone resorption in T2DM, which is consistent with the

findings of Achemlal et al. [1]. A decrease in bone turnover in patients with type 2 diabetes mellitus with a decrease in bone formation and an increase in bone resorption, which is manifested by a low concentration of P1NP and a relatively increased concentration of b-CTx, was shown by Gilbert et al. [4]. Other researchers have also noticed a significant decrease in the activity of alkaline phosphatase as a marker of bone formation in patients with type 2 diabetes mellitus [10]. Our study found no significant differences in ALP values. Also, the role of glycemic control in maintaining bone mass in diabetes should be emphasized. The data support that bone formation abnormalities are mainly observed in patients with poorly controlled diabetes. Studies indicate that the end products of glycolysis inhibit osteoblast function [5,7]. Puspitasari et al. [8] showed that restoration of metabolic control of diabetes mellitus within a short time leads to inhibition of bone resorption and stabilization of bone mineral density. Other authors observed a negative correlation between the concentration of b-CTx and HbA1c, which may indicate the activation of resorptive processes in the bone tissue in patients with type 2 diabetes mellitus and the restoration of metabolic processes in the bone while improving the metabolic control of diabetes [1]. In our study, we did not confirm this connection. The concentration of b-CTx in the study group of patients was significantly associated with PTH ($r = 0.434$, $p = 0.001$), which may indirectly indicate a relationship between calcium-phosphorus metabolism and an increase in bone resorption. This association was seen in Yendt et al. [10], who showed a positive correlation between PTH and calcium clearance, BMD, and bone mass.According to the results of the study of the T-score for lumbar spine area, BMD was reduced in 44% of patients with DM2; in the area of the femoral neck in 36% of patients. Given from these studies, it is important to remember that fractures in patients with T2DM can occur even at high BMD values [1]. These results suggest that bone disorders and associated fracture risks are a clinically significant and often underestimated problem in type 2 diabetes.
The results of the study demonstrated that the content of markers of bone metabolism in the blood serum of patients with T2DM in comparison with the control group indicates a decrease in the bone formation marker PINP in patients with T2DM by 12%, in comparison with the control group and an increase in the marker of bone resorption b-CTx in 25 % of patients with type 2 diabetes, of which women were 1.5 times more than men. Patients with T2DM had lower b-CTx values and relatively higher P1NP levels, which reflects less pronounced changes in bone metabolism, regardless of age and duration of the disease. According to the results of the study of the T-score of the L1-L4 region, BMD was reduced in 44% of patients with DM2; in the area of the femoral neck in 36% of patients. These results suggest that bone disorders and associated fracture risks are a clinically significant and often underestimated problem in diabetes.

CONCLUSION

The results of T-score studying, confirmed that in both men and women with diabetes, in comparison with the control, the bone density in the vertebrae was reduced. The level of b-CTx showed a statistically significant negative correlation with the BMD of the lumbar spine, consisting mainly of a spongy bone with high metabolic activity. This indicates that both bones metabolism markers and DXA can be considered as independent indicators of changes in bone tissue, which can be of great importance for early diagnosis and evaluation of the effectiveness of the therapy.

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