HYPOTHYROID PATIENT SUFFERING FROM SEVERE CARDIOVASCULAR COMPLICATIONS TREATED WITH STATINS RESULTING IN SUSPECTED RHABDOMYOLYSIS AS A SIDE EFFECT AND A PROMISING MANAGEMENT APPROACH WITH THE USE OF LEVOTHYROXINE: A CASE STUDY

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Introduction. Rhabdomyolysis is defined as the disintegration of skeletal muscle tissue resulting in the liberation of intracellular contents inclusive of myoglobin, potassium, creatine phosphokinase (CPK), phosphate and urate into the blood and extra cellular space.[1] Its causation is deemed multifarious and the use of drugs such as statins is amongst them. Rhabdomyolysis is a rare but severe side effect of the use of statins as it may lead to myoglobinuria and subsequently result in acute kidney injury due to an increase in creatinine and blood urea nitrogen.[2] Statins work by reducing cholesterol levels in blood and are postulated to be useful in treatment of patients suffering from hypothyroidism. In the case of severe hypothyroidism there is slowed metabolism of the individual leading to a decrease in elimination of cholesterol thus capacitating a substantially increased level of cholesterol in blood prompting to plaque formation and an elevated risk of cardiovascular disease hence treatment is rendered with an immensely high dose of statin that expedites the development of rhabdomyolysis.[3]

Purpose of the study. This case study exhibits a propitious array of treatment with levothyroxine in a patient suffering from hypothyroidism who developed rhabdomyolysis as a complication upon treatment with high doses of statin for severe cardiovascular indispositions.

Materials and methods. In October 2023, patient K., 42 years old, was transferred to the endocrinology department of the health care institution “Grodno University Clinic” from the cardiology department of the health care institution “Grodno Regional Clinical Cardiology Center” with decompensation of newly diagnosed hypothyroidism syndrome. At the time of admission, the patient complained of swelling in the face and lower extremities, weight gain, drowsiness, memory loss, difficulty of speech, pain, and weakness in the lower extremities. According to the patient, these complaints have been bothering him since January 2023. The medical history of the patient revealed a myocardial infarction in 2021 and mammary coronary bypass surgery in 2022. Among the concomitant diseases, psoriasis has been present for a long time. The patient's treatment included angiotensin-converting enzyme inhibitors, antiplatelet, diuretic and lipid-lowering therapy. During statin therapy, the patient noted severe muscle pain in the lower extremities and lumbar region. According to the patient, upon self-cessation of statin

therapy, the pain syndrome had subsided. In the cardiology department, the patient underwent a blood test to determine the level of thyroid hormones during which hypothyroidism syndrome was detected.

Research results. Based on the results of a hormonal study of thyroid function, the following results were obtained: thyroid-stimulating hormone 60 μIU/ml (0.25 - 5.0 μIU / ml), free T4 1 pmol / l (10.6 - 19.4 pmol / l), antibodies to thyroid peroxidase 872.2 IU/ml (0 – 8 IU/ml). According to the results of laboratory tests, no deviations from the reference values were identified from a general blood test and a general urinalysis. In accordance with the results of a biochemical blood test, total protein, albumin, urea, uric acid, C-reactive protein, total bilirubin, glucose, sodium, potassium, chlorides, iron – were within the reference values; there was an increase in creatinine level - 188 μmol/l (66- 124 μmol /l) (eGFR 39ml/min/1.73m^2-stage IIIb CKD-EPI) aspartate aminotransferase – 65 U/l (5 – 37 U /l), a significant increase in the level of creatine kinase – 2096.9 U/l (0-190 U /l).

As per the results of an ultrasound examination of the thyroid gland, the total volume was 18 ml, the contour was clear, uneven, echogenicity was reduced, the echo structure was diffusely heterogeneous, fibrous heaviness was pronounced, regional lymph nodes were without features. Electrocardiogram data – heart rate 50 beats per minute, horizontal position of the electrical axis of the heart.

Having considered the results of laboratory and instrumental studies, the patient was prescribed hormone replacement therapy - levothyroxine 150 mcg once a day in the morning, followed by monitoring of thyroid function and, if necessary, correction of hormone replacement therapy.

During treatment, the patient noted an improvement in his condition. The laboratory reports following treatment within a week showed a decrease of serum creatinine levels 134 μmol / l (initial levels 188 μmol / l), creatine kinase 1806 U /l (initial levels 2096.9 U /l). The recent eGFR result was as follows; 58ml/min/1.73m^2 - stage IIIa CKD-EPI.

Conclusion. In a patient suffering from primary hypothyroidism, clinical and hormonal decompensation treated with high doses of statin therapy for severe cardiovascular ailments resulted in rhabdomyolysis. Upon cessation of statin therapy and substitution of treatment with levothyroxine demonstrated an improved prognosis of the patient.

Literature

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A case of a patient recently diagnosed with primary hypothyroidism, clinical and hormonal decompensation who was previously treated for atherosclerosis with severe cardiac complications received high doses of statin therapy progressing to rhabdomyolysis. Upon cessation of statin therapy and substitution of treatment with levothyroxine, the patient presented improved prognosis.

COMPARATIVE CHARACTERISTICS OF VARIOUS GENERATIONS OF ADHESIVE SYSTEM

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Introduction. Dental adhesives are solutions of resin monomers that make the resin dental substrate interaction achievable. Adhesive systems are composed of monomers with both hydrophilic groups and hydrophobic groups. The former enhances wettability to the dental hard tissues, while the latter allow the interaction and co-polymerization with the restorative material. The chemical composition of adhesives also includes curing initiators, inhibitors or stabilizers, solvents and, in some cases, inorganic filler [1, 2]. However, it is necessary to consider the anatomy of tooth. In particular, composition and structure of two main tissues, enamel and dentine, need to be examined in order to understand how they influence adhesive bonds. Details of the composition of these tissues are shown in. The mineralized part of the tooth is a complex structure made of different hard tissues, which have a quite distinct ultra-morphology and composition [3]. This study shows the results of a comparative analysis of various adhesive systems.

Purpose of the study. Conduct comparative analyzes of the hybrid layer using adhesive systems of 4th, 5th and 7th generations.

Materials and methods. For the study, 15 intact teeth were selected, extracted for orthodontic reasons. After extraction, the teeth were placed for disinfection and storage in a 10% formaldehyde solution at room temperature. The criteria for inclusion of teeth in the study were: absence of carious lesions of the root, absence of previous endodontic treatment, absence of restorations, absence of non-carious lesions of hard dental tissues.