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ATHEROSCLEROTIC CARDIOVASCULAR DISEASE IN A YOUNG MALE WITH DIABETES – CASE REPORT

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Abstract

Type 2 diabetes mellitus (T2DM) is a progressive chronic disease, whose prevalence is steadily increasing worldwide. Although long-term complications of diabetes develop gradually, they cause serious damage or even life-threatening, especially when glycemic values are not controlled over time. In this article, we are presenting the case of a young patient, late diagnosed with T2DM, directly in a stage with chronic complications, which over time did not follow the indications recommended by doctors, leading to an undesired outcome, which may highlight the need for active screening of diabetes mellitus and other cardiovascular risk factors, both in people with diabetes as well as in the general population, to prevent such events.

key words: *diabetes mellitus, cardiovascular risk, peripheral artery disease*

Background

Diabetes mellitus (DM) continues to be an ever growing problem worldwide, as indicated by the latest statistical data published at the end of 2017, which describe a global prevalence of 8.8%, an estimated number of 425 million individuals aged between 20 and 79 years old being reported with DM [1]. It is estimated that by 2045, the DM prevalence will increase up to 9.9%, over 629 million individuals will suffer from this condition. In Romania, according to the PREDATORR study, in 2014, the DM prevalence adjusted to age and sex was 11.6% [2]. It is estimated that the number of deaths caused by DM worldwide exceeds 4 million a year in the individuals aged between 20 and 79 years old [1]. Type 2 diabetes mellitus (T2DM) is a chronic progressive disease and it represents 90% of all the diagnosed DM cases all over the world [1], being an independent risk factor for the development of both micro vascular complications (retinopathy, nephropathy and neuropathy) and macro vascular complications (coronary disease, peripheral vascular disease and cerebrovascular disease) [3]. The literature describes the fact that individuals with T2DM particularly present a higher predisposition for developing macro vascular complications [4,5].

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Cardiovascular atherosclerotic disease represents the main cause of disability and mortality in patients with T2DM [5,6], these having a 3-4 times higher mortality risk of cardiovascular diseases in comparison to individuals without DM [4,6]. Also, in individuals with DM, is described that the cardiovascular atherosclerotic disease appears 14.6 years earlier, it is more severe, it has a much more diffuse distribution than in individuals without DM [7,8], it is more distal, interesting the small arteries, with the cancellation of the protector role of women [9]. Individuals with DM without any heart attack in their history have the same cardiovascular risk as individual without DM but with a previous heart attack [9]. Coronary arterial disease is one of the components of generalized atherosclerosis, various epidemiological studies showing that there is a strong connection between DM and the high prevalence of this condition [5,10,11]. DM is the main cause of non-traumatic amputation worldwide, every 30 seconds, somewhere in the world, a person with DM suffering an amputation of a limb or segment of the lower limb [1,5]. Regarding the cerebrovascular disease, DM increases the risk for this condition, and also for its complications, including recurrence or death [9,12].

Case presentation

This case presentation was performed in accordance with the Declaration of Helsinki (the patient was informed and agreed with the scientific use of his medical data).

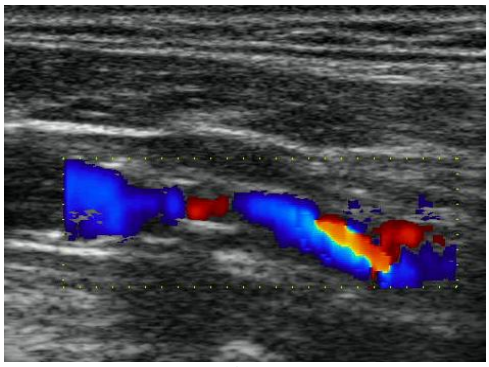
A male patient aged 48 years old, diagnosed with T2DM 15 years ago, smoker (he smoked for approximately 25 years over 20 cigarettes/day), alcohol consumer, with low educational level and economical status, non-compliant with the recommendations regarding the prescribed diet and medication.

The family medical history is suggestive for a high risk of developing DM and cardiovascular disease, as well. His father had T2DM and suffered a heart attack at the age of 45-years-old, and the maternal grandmother was also diagnosed with T2DM and ischemic stroke at the age of 62 years old.

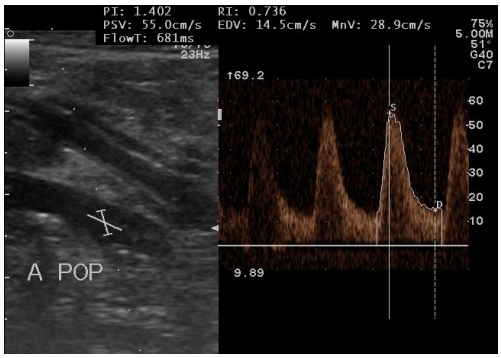
The personal medical history indicates: T2DM since the age of 33 years old, in a patient with obesity diagnosed directly in the stage of chronic complications (non-proliferative retinopathy, diabetic neuropathy), with typical symptoms of DM, high glycated hemoglobin (HbA1c >14%) and severe dyslipidemia. Ever since the DM diagnosis, the patient presented a weak perceptible pulse in the dorsalis pedis arteries and posterior tibial arteries. 5 years after the DM diagnosis, high blood pressure values were observed, repeatedly exceeding 180/110 mmHg, with an inconstantly administered treatment; 10 years after the DM diagnosis, there were observed sequalae lesions of a silent myocardial infarction, which leads us to the idea of the severity of diabetic neuropathy, causing analgesia.

At the same time, a Doppler ultrasound of the lower limbs was performed, thus advanced bilateral atherosclerotic lesions, mainly at distal level were observed lesions that imposed revascularization procedures (Figure 1a,b).

After performing the angiography for diagnosis and therapeutic purposes, a revascularization intervention in the left limb was performed, with a favorable evolution, angiographically verified. (Figure 2a,b). Although a revascularization in the right lower limb was recommended, due to critical stenosis (Figure 3), the patient did not accept it, also refusing the recommendation of coronary angiography.



a)



b)

Figure 1a, b. *Critical stenosis in the right popliteal artery (1a), which causes a uniphase, post stenosis flow (1b), with a low velocity. Color and pulsed Doppler ultrasound.*

a)

b)

Figure 2a, b. *Diagnosis angiography – critical stenosis in the left popliteal artery (2a). Angioplasty with balloon in the popliteal artery and the tibia-fibula trunk, with the reestablishment of the flow in the left tibia and fibula arteries. Left posterior tibia artery occlusion (2b).*

Figure 3. *Critical stenosis in the right popliteal artery and occlusion in the anterior tibia artery and right fibula artery.*

The history of administered medication: after 2 months of insulin treatment, the patient started to receive antidiabetic oral drugs, for 13 years, finally accepting the insulin treatment, imposed by the chronic kidney disease, still with a recurrent interruption.

Present setting: the patient presented with a metabolic misbalance, with an intense pain and ulcerative lesions in the right lower limb, fever, fatigue, insomnia, anorexia. The patient stated that the lesions appeared 3-4 months earlier, for which he underwent a treatment at home (repeated dressings, local application and antibiotics treatment for the last 2 weeks).

Clinical examination: obesity, poor general state, febrile, pale and dehydrated mucosa and skin, palpebral xanthelasma, hair loss in the calves, dry necrosis in the right hallux, infected necrosis in toes IV and V with perilesional cellulites – right leg (Figures 4,5); in the right leg, two infected skin ulcers with a diameter of 1 cm and 2 cm, respectively (Figure 6); bilateral plantar hyperkeratosis, nail dystrophy, absent tactile, vibratory and thermal sensitivity, abolished osteotendinous reflexes.

Figure 4 and 5 . *Dry necrosis in the right hallux, over infected necrosis in toes IV and V with perilesional cellulites – right leg*

Figure 6. *Over infected ulcers with a diameter of 1 cm and 2 cm – on the right leg*

Laboratory tests showed the following: high blood sugar values (>300mg/dL), HbA1c=12.3%, mild anemia, thrombocytopenia, leukocytosis with neutrophilia, nitrate retention

increase, with the estimated glomerular filtration rate (eGFR) at 26.7ml/min/1.73 m^2 (CKD-EPI), total-cholesterol 378mg/dL, triglycerides 462 mg/dL, liver cytolysis, moderate acidosis, urinary ketones, inflammatory syndrome (erythrocyte sedimentation rate = 87mm/1 hour, high presepsin-1347pg/mL). Both the wound culture and the blood cultures taken in a febrile state, indicated the presence of Staphylococcus Aureus. Electrocardiographic examination: the previous changes persist (old myocardial infarction).

We initiated the treatment for hydro-electrolytic balancing, antibiotics treatment was adjusted according to the eGFR, starting with broad-spectrum antibiotics, thereafter guided by the antibiogram scheme, and then the patient was referred to the surgery department for specialized treatment, with indication for amputation, which he refused at first, subsequently being performed the amputation of the thigh. After-surgery, due to the tendency of collapse and onset of multi organ failure, the patient was transferred to the intensive care unit (ICU). During the entire hospitalization period, the patient's state maintained severe, and after 11 days since the admission, death occurred, as a consequence of a stroke, with right hemiplegia and cardiac and respiratory arrest, the over acute evolution of this state not allowing further investigations.

Discussion

This case is a typical example of a silent evolution of DM, with a late diagnosis, in an advanced stage, with numerous macro and micro vascular complications, with a rapid evolution, not allowing the extension of further investigations or conservatory treatment approaches; although the patient presented a very high cardio metabolic risk (high blood pressure and severe mixed dyslipidemia, with intermittent medication administered, smoker, obese, with collateral family history that indicated a risk for descendants- father with DM and cardiac arrest at young age), he did not undergo any investigation as recommended, neither for DM or for other cardiovascular risk factors; even from the first diagnosis, the patient presented diabetic retinopathy and neuropathy, then, 10 years after the diagnosis, he accidentally discovered a myocardial infarction sequel, not complying with the medical recommendations at that moment, either. The patient refused the performance of arteriography, which was required, due to the clinical changes in the right leg (lack of pulse in the posterior and pedious tibial arteries, low temperature of the leg), and due to the ankle brachial index with low values. At last admission, he presented with a septic state, with multi organ failure, with numerous ulcerous-necrotic lesions, which might have been the consequence of a ruptured atheroma plaque, in a setting of an advanced atherosclerosis, where none of the treatment targets of CVR factors was attained, in an endeavor of trying to stop the evolution. Therefore, this patient presented major cardiovascular events in all the three areas: cardiac, peripheral vessels and cerebrovascular region.

Conclusions

An active screening for DM and of other cardiovascular risk factors should have been compulsory in an individual with cardiac, metabolic and obesity history; although the presence of a silent myocardial infarction would have required a complex cardiovascular investigation and the control of all risk factors, the patient refused the extension of investigations, and the treatment was intermittent, only during the periods that there were alarming symptoms, not acknowledging or

accepting the severity of the complications. It is already well-known the fact that T2DM may progress without any signs and symptoms for long periods of time, thus being required an early active diagnosis, especially in the patients with a high risk. Amputation would have been a treatment solution, which could have saved this patient's life, if performed in due time.

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