Gestational cardiomyopathy

Gestational cardiomyopathy is classified among idiopathic cardiomyopathies.[1] The pathophysiological mechanisms have not yet been fully elucidated. Diagnosis usually takes place by exclusion. [2] In order to be able to establish this diagnosis, three basic diagnostic criteria must be met - the presence of acute heart failure with a reduced ejection fraction, the manifestation of difficulties in the peripartum period or in the few months after childbirth (eventually abortion), and the exclusion of other possible causes of heart failure. [2][3][4] The clinical picture of pregnancy cardiomyopathy is diverse. Pharmacological intervention is limited, among other things, with regard to the health of the fetus. ⚠**This is a potentially life-threatening disease requiring early diagnosis.**

Etiopathogenesis

The pathophysiological mechanisms leading to the development of pregnancy cardiomyopathy are not yet completely clear. Genetic, nutritional, hormonal, metabolic and other factors, and especially their mutual combination, contribute to the manifestation of the disease. Specifically, low levels of selenium, infection with cardiotropic viruses (myocarditis), autoimmune or other inflammatory reactions, oxidative stress, and hormonal imbalance may play a role in the pathophysiology of the disease. According to recent research, oxidative stress leads to the cleavage of prolactin molecules. Its fragments then act proapoptically in the myocardium, leading to vasoconstriction and inhibiting angiogenesis. The role of other hormones, e.g. VEGF and sFlt-1 (also occurs in patients with preeclampsia) is also being investigated.

Genetic predisposition also plays a significant role. In 15–20% of patients, genetic mutations were detected, for example for titin and the heavy chain of beta myosin. However, not all patients with identified mutations must develop the disease, so there will be a non-negligible share of other factors.

Epidemiology

In addition to risk factors, the incidence of gestational cardiomyopathy also depends on the ethnicity of the patient. It is more common in African and African-American women. In Nigeria, the incidence of gestational cardiomyopathy is 1:100, while in Germany, for example, it is only 1:1500. In the United States, the incidence is from 1:1000 to 1:4000. In African-American women, however, cardiomyopathy manifests itself at a younger age and often with worse ejection fraction values.

In addition to ethnic group, risk factors for the development of cardiomyopathy in pregnancy include the presence of preeclampsia, hypertension, diabetes, a positive family history of cardiomyopathy, multiparity and older age of the mother.

Clinical picture

The clinical picture is similar to other cases of heart failure. Most patients report more slowly developing dyspnea, peripheral edema, chest pain and dizziness. In a considerable number of cases, these symptoms are attributed to the normal physiological state at the end of pregnancy, or after childbirth. Early diagnosis is very important for this disease and its prognosis depends significantly on it.

In the differential diagnosis of the patient's problems, it is necessary to exclude other possible provoking (perhaps even pre-existing and as yet unmanifested) diseases. This mainly refers to other types of cardiomyopathies, acute myocarditis, embolization, pre-existing valvular or congenital heart disease and others.

Diagnosis

Diagnosis is by exclusion. All patients with suspected pregnancy cardiomyopathy must undergo an echocardiographic and laboratory examination. The role of endomyocardial biopsy in this diagnosis is controversial and is used only in very specific situations.

The ECG finding is nonspecific and may be normal. Frequently detected pathologies are repolarization changes and QTc prolongation.

Echocardiography, or magnetic resonance of the heart, are useful in terms of differential diagnosis and estimation of the patient's prognosis. The ejection fraction is reduced, mostly below 45%, changes in the dimensions of the heart compartments, the presence of functional valvular regurgitation and signs of pulmonary hypertension are also described. The methods also serve to exclude the formation of intracardiac thrombi. If the patient has not given birth, the administration of gadolinium contrast agent should not be part of the magnetic resonance examination of the heart.

Laboratory parameters show an elevation of natriuretic peptides.

Therapy

Treatment of gestational cardiomyopathy is not simple and it is essential that it starts as soon as possible. It is limited, among other things, by the fact that some drug groups usually used in the treatment of heart failure have toxic and teratogenic effects on the fetus. ACE-inhibitors, sartans, aldosterone receptor blockers and ivabradine are contraindicated in pregnant patients. Digoxin should be used with caution. Beta blockers, nitrates and diuretics are mainly used to treat heart failure in pregnant patients. There is an increased risk and occurrence of thromboembolic complications in patients with pregnancy cardiomyopathy. In indicated cases, prophylactic anticoagulant treatment with low-molecular-weight heparin is also recommended. Warfarin is contraindicated due to its teratogenic effects.

The situation with pharmacological treatment changes as soon as the patient gives birth. At this stage, it is possible for patients to be prescribed some drug groups that are contraindicated during pregnancy. In any case, however, caution is necessary mainly because there is not enough data from large studies available yet.

In addition to anticoagulant treatment, the treatment of more serious conditions may also require ionotropic support, mechanical support including ECMO or even heart transplantation. In the US, heart failure due to gestational cardiomyopathy is the primary reason for heart transplantation in 5% of women.

A promising drug is the dopamine D2 receptor agonist bromocriptine. Several studies have shown its beneficial effect on reducing mortality. However, some studies did not confirm such results. Currently, bromocriptine is more widely used in Europe than in the US, where it is still considered more of an experimental treatment. Due to the higher risk of thromboembolic events when bromocriptine is administered, prophylactic anticoagulant treatment is administered at the same time.

It is not yet clear how long pharmacological treatment should last even after normalization of cardiac function. However, at least it is a period of 12-24 months, with some patients the therapy is longer. The fact that longer-term pharmacological treatment is necessary for this disease is supported by cases where heart function worsened again after stopping treatment.

Childbirth and breastfeeding

If the patient is hemodynamically stable, doctors prefer delivery via the classic route. In hemodynamically unstable patients, premature delivery by caesarean section is sometimes necessary.

The issue of breastfeeding is still debated. There are no uniform recommendations yet. For patients with a severe course, experts tend to suspend breastfeeding. In other cases, according to studies, breastfeeding is well tolerated by patients.

Prognosis

Many factors affect the prognosis of patients. Among the main ones, early diagnosis and timely initiation of treatment, ethnicity, severity of heart failure and pre-existing diseases such as pre-eclampsia can be mentioned. In approximately 50-75% of patients, within 6-12 months, the condition will improve and the heart function will normalize. In almost 20% of patients, rhythm disorders are detected (of which 5% are malignant arrhythmias) , in 10-17%, intracardiac thrombi are detected and, according to some studies, pregnancy cardiomyopathy is not diagnosed in almost half of the patients eg pulmonary edema, signs of hemodynamic instability, thromboembolic events, etc. Mortality is therefore highly variable. In the USA, the one-year mortality is in the range of 4-11% (a higher figure especially for African-American women), in African countries it is even more than 20%.

The question of further pregnancies is complicated. All patients have a higher risk of developing complications, chronic heart failure and eventually mortality. Although the mortality rate is not so high in patients with normal heart function, a roughly 20% incidence of relapses is observed in them. If the patient does not have normal heart function at conception, the mortality rate is 16-25% according to some studies. The risk of developing chronic heart failure is also higher. Deciding on a further pregnancy is therefore highly individual and may require changes in medication and thorough monitoring of the patient's condition.

Resources

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Related articles

- [1] (https://www.wikiskripta.eu/w/Kardiomyopatie)Cardiomyopathy

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