

Preeclampsia is a set of symptoms occurring usually after the 20th week of pregnancy and it is characterized by elevated blood pressure (140/90 mm Hg), accompanied by proteinuria. Among the additional symptoms of preeclampsia there are mentioned:

- swelling
- headaches
- abdominal pain

Moreover, the laboratory tests pointed out that the platelet number is decreased whereas the activity of liver enzymes (AST, ALT) is increased in the blood of women with preeclampsia.

Although the significant progress in perinatal medicine it has been observed lately, pregnancy complicated by preeclampsia is still a challenge for obstetricians due to the higher rate of maternal and fetal death.

Moreover, up till now there has been no appropriate knowledge to develop effective methods of treatment of women whose gestations are complicated by preeclampsia. The standard treatment of preeclamptic women is based on the administration of drugs designed to decrease of blood pressure and on monitoring vital parameters of the fetus. Unfortunately, this scheme of treatment is not always effective and the obstetrician sometimes needs to decide on the early termination of the gestation. However, the decision about the early termination of the pregnancy does not always save the life of the mother and her child. Moreover, if the infants survive it may have a serious health problems related to premature birth.

Among the factors predisposing to the appearance of hypertension in pregnancy there are mentioned:

- first pregnancy,
- mother's age below 18 or above 35 years,
- episode of preeclampsia/eclampsia the a previous pregnancy,
- occurrence of preeclampsia in the first-degree family members (mother, sister),
- hypertension diagnosed before pregnancy,
- cardiovascular diseases,
- neurogenic diseases,
- endocrine diseases,
- systemic diseases (e.g. lupus, antiphospholipid syndrome),
- kidney diseases,
- hydramnions,
- multiple pregnancy,
- diabetes diagnosed before the period of pregnancy or gestational diabetes,
- multifetal pregnancy,
- edema of the fetus,
- improper diet and stress during pregnancy.

Epidemiological studies indicate that obesity also increases the risk of preeclampsia up to about 40%.

Unfortunately, despite the extensive knowledge about the risk factors for preeclampsia development, the main mechanism that leads to the appearance of clinical symptoms of preeclampsia still has not been known. Numerous studies pointed out that one of the main reason of preeclampsia development is an incorrect implantation of the embryo into the uterine wall in the early stage of gestation.

This improper implantation causes a local inflammation in the uterus and an increased destruction (apoptosis) of placental cells leading to the damage of the endothelium of women's vessels and hypertension development. The aim of this project is to investigate the mechanism that leads to the increased apoptosis (destruction) of placental cells. This project should also answer the question: whether blocking of this "preeclamptic" mechanism may lead to a slowing down of placental cells apoptosis. The reduction of placental apoptosis may contribute to the inhibition of the development of preeclampsia. Moreover, the results of this project may in the future contribute to develop of a new treatment standards of preeclamptic women.