

Description for the general public:

Many cultures worldwide believe that a mother's well-being during pregnancy affects how her children develop. For some time now, attempts have been made to verify this belief in animal and human studies. The potential influence of stress experienced during pregnancy on the child's tendency to react with negative emotions (known as negative reactivity) is of particular interest. This temperamental trait is a possible risk factor for mental disorders and general health problems later in life. In itself, prenatal stress is a threat to proper development. Previous studies on humans suggest that the greater the severity of stress a woman experiences during pregnancy, the more likely her baby is to be characterized by so-called negative reactivity. Some studies also showed positive relationships between prenatal stress and infants' stress reactivity. However, these relationships are not fully confirmed. One weakness of the existing research is that the child's temperament is measured using the mother's assessment. Many studies suggest that such assessments can be affected by the mother being in a negative mood (for example, postpartum depression). It is also unknown what factors and mechanisms may modify the relationship between prenatal stress and the child's characteristics. One proposed biological mechanism is the composition of the bacteria inhabiting the child's digestive system (the microbiota). Many studies have shown that bacteria in the digestive system influence the risk of various health problems. It has also been demonstrated that microbiota is likely related to prenatal stress. The quality of mother-infant interactions may also play a role in the relationship between prenatal stress and a child's temperament or stress reactivity. Such interactions are vital for a child's emotional and social development.

Considering all this, the proposed research aims to investigate the relationship between the stress experienced by women during pregnancy and the child's negative reactivity and stress reactivity. It also seeks to determine the role of mother-infant interactions and the composition of the child's microbiota in these relationships. Two hundred and fifty mother-child pairs will participate in the study. Prenatal stress will be measured using a set of questionnaires in the second and third trimesters of pregnancy. It will also be evaluated using cortisol levels in the mother's hair samples. The child's temperament will be determined using questionnaires and observational measures twice – in the 12th and 24th weeks of the infant's life. The quality of the mother-child interactions will be assessed using observational methods. The infant's reactivity to a natural stressor will be assessed using cortisol levels in saliva. Finally, the microbiota composition will be evaluated based on stool samples collected from the child at 12 weeks of age. For this purpose, a cutting-edge bacterial DNA sequencing method will be used. This study will help us better understand the relationship between prenatal stress and child characteristics and identify potential mediating mechanisms. In addition, the results of this study may help develop intervention methods to ensure the well-being of women during pregnancy.