

## **Description for the general public**

In women with symptoms of stress or mixed urinary incontinence (SUI and MUI) conditions such as pelvic organ prolapse, weakening of fascia-ligament-muscle structures and disorders of the blood supply to the tissues of this area can be observed. The therapy in patients with the occurrence of this type of symptoms should be directed to increase the strength and the endurance of the pelvic floor muscles (PFM) as well as increase the elasticity of the pelvic floor structures. It seems that one of the methods that could positively affect the pelvic floor is stimulation with deep electromagnetic field of high frequency (DEMF, high-inductive, deep penetrating pulsed electromagnetic stimulation). The impact of stimulation with DEMF on the pelvic floor structures in women with MUI is the foundation of this research project and is based on substantive grounds of the influence of the stimulation on tissues healing process, improvement of neural tissue regeneration, increased elasticity and tissue perfusion, and pain alleviation in chronic conditions.

The primary aim of the study is objective electromyographic evaluation of PFM and elastographic assessment of pelvic floor structure after application of DEMF stimulation of pelvic floor in women with SUI and MUI symptoms. Researchers assume that DEMF stimulation will affect the bioelectrical activity of PFM and elastic properties of evaluated structures. Bioelectrical activity of PFM will be assessed by means of surface electromyography (sEMG). The evaluation of pelvic floor tissue elasticity will be conducted with the use of elasticity imaging device (EI). The main hypotheses assume that the intervention in the form of DEMF stimulation increases resting and functional bioelectrical activity of PFM and increases the elasticity of pelvic floor structures. The evaluation of selected biophysical parameters will also include a placebo group. In order to analyze the persistent changes of particular parameters the registration of selected phenomena will be conducted immediately before and after the stimulation as well as 1 hour and 24 hours later.

The reason for undertaking the subject is an attempt to assess the influence of the DEMF stimulation on the pelvic floor structures. A growing number of patients with symptoms of urinary incontinence requires from medical staff as well as researchers' teams to search for and develop new, more effective therapeutic methods. More and more of commercial companies which are producing medical equipment, more often bring to the market modern devices designed for particular disease. Device for DEMF stimulation can be assigned to this type of equipment. Manufacturers recommend DEMF stimulation as an effective, comprehensive, non-invasive and safe method also in the treatment of SUI and MUI. Underlined is its effect on peripheral nerve stimulation, muscle activation, improvement of composition of collagen structures and improvement of blood circulation. The lack of reports on the impact of DEMF on the pelvic floor prompted the authors to undertake this study.

All research tasks included in the project are to contribute to the development of the theoretical basis of the impact of DEMF stimulation on assessed anatomical structures. The demonstration of the beneficial effects of DEMF stimulation will allow to introduce new, effective methods to the conservative therapy, improving the tension of PFM as well as the elastic properties of myofascial and ligamental structures of this area. These studies will present basic and necessary information that could be used in subsequent studies that examine the therapeutic aspects of DEMF stimulation. Confirmation of the assumed results, will allow to improve the effectiveness of conservative treatment of patients with SUI and MUI.