

## **Viofor – The first, non-pharmacological medical device with a clinically proven immunocorrective action**

After obtaining a positive review from clinical experts the certification body TÜV NORD Polska recommended extending the indications for use by:

### **Immuno-corrective action on the immune system in:**

- **Infection of respiratory system**
- **Non-healing wounds, leg ulceration, thermal burns**

Confirmation document: letter from TÜV NORD Polska certification body of 16.06.2020.

The topic which served as the inspiration to perform the clinical assessment in the field of improving the immune system was the appeal of the European Commission (2020) to intensify the search for direct or indirect treatment methods for patients suffering from COVID-19. As a result of the scientific library review of Viofor products publications from clinical trials and preclinical “in vitro” studies describing the effectiveness of using Viofor magnetostimulation to improve the immune system were identified.

**The therapeutic factor** is the low-frequency and low-induction pulsed magnetic field, shaped as signals forming a multi-peak frequency spectrum in the Viofor JPS System.

**Mechanism of action.** The immuno-corrective effect occurs by stimulating the thymus-dependent maturation process of regulatory T cells and supplementing deficiencies of this cell population in the immune system, as well as by lowering the concentration of pro-inflammatory factors (interleukin 1beta, IL-1 $\beta$ ) and increasing anti-inflammatory factors (interleukin 10, IL-10), improving defensive performance of the immune system.

The research was carried out in:

1. Military Institute of Hygiene and Epidemiology, Warsaw, Poland
2. Military Medical Institute, Warsaw, Poland
3. Military Medical Institute, Clinic of Pediatrics and Children Nephrology, Warsaw, Poland
4. Medical University of Lodz, Department of Rehabilitation and Physical Medicine, Poland
5. Medical University of Lodz, Department of Pediatrics, Preventive Cardiology and Clinical Immunology, Poland
6. Military Institute of Hygiene and Epidemiology, Immunology Laboratory, Warsaw, Poland
7. Military Institute of Health Services, Department of Plastic Reconstructive Surgery and Treatment of Burns, Warsaw, Poland

**All cited studies were conducted with the use of Viofor JPS System, manufactured by Med Life Sp. z o.o.**

### **The clinical aspects evaluated during studies**

- The influence of slow-changing magnetic field in the therapy of autoimmune disorders in children with recurrent respiratory tract infections;
- The influence of magnetostimulation on immune-corrective functions of the immune system in patients with thermal burns;
- “In vitro” tests – Evaluation of the activity of regulatory T cells isolated from blood and the level of anti-inflammatory and pro-inflammatory cytokines;
- The influence of magnetostimulation on melatonin secretion.

Immunological tests included the following parameters:

Proinflammatory cytokine concentration, anti-inflammatory and immunoregulatory cytokine concentration, immunological competence parameters of T lymphocytes (number and activity level of regulatory T lymphocytes), immunogenic activity of monocytes and selected cytokines, level of melatonin after surgery. The incidence and course of illness as well as the need for antibiotics and drug expenditure were all subjects of the assessment.

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**Viofor is the first medical device with effect immunocorrective effect and a non-pharmacological method of improving the immunity.**

## **Results**

Viofor's magnetic field of low frequency stimulates the thymus-dependent maturation process of T lymphocytes, decreases the concentration of pro-inflammatory factors (interleukin 1beta, IL-1 $\beta$ ) and increases the anti-inflammatory factors (interleukin 10, IL-10) improving the defensive efficiency of the immune system. An important confirmation of the immunocorrective mechanism of Viofor JPS magnetostimulation is the immunotropic interaction not only "in vivo" in relation to the whole organism, but also "in vitro" in relation to immune cells isolated from blood. Viofor's Magnetic field of magnetostimulation exerts an immunocorrective effect by improving the defensive functions of the immune system thus supporting the functioning of the Immune system.

*"The key to natural immunity is the secretion of melatonin which acts immunomodulatory affecting cytokine production or stimulating immunocompetent cells to secrete opioids. Melatonin's role can be compared to an "immunology buffer" which stimulates the immune processes, especially in states of their disorder e.g. as a result of infection, immunosuppression, stress or advanced age but also stops them in case of excessive use of the immune system (which occurs in cases of severe infections such as COVID-19). That is why it is so important that the Viofor JPS magnetostimulation treatments do not disturb the daily cycles associated with nocturnal melatonin secretion. In blood samples gathered from healthy endocrine patients there were no irregularities regarding the melatonin secretion in blood serum" – says Professor of the Medical University of Lodz M.D., dr hab. Marta Woldańska – Okońska, orthopaedic surgeon – traumatologist, specialist in medical rehabilitation, specialist in balneology and physical medicine, Medical University, Lodz.*

Based on the obtained results, it was found that the magnetic field stimulation of the Viofor JPS System improves thymus-dependent maturation process of regulatory T cells and supplements deficiencies of the cell population in the immune system, as well as by reducing the concentration of proinflammatory factors (interleukin 1beta, IL-1 $\beta$ ) and an increase in anti-inflammatory factors (interleukin 10, IL-10), improving the defensive efficiency of the immune system.

**Based on the results, the following conclusions were drawn:**

1. Favorable results of the use magneticfield stimulation of the Viofor in the treatment of secondary immune deficiencies in patients with recurrent respiratory tract infections are the result of stimulation of the thymus-dependent process of T lymphocyte maturation and supplementation of deficiencies of this cell population in the immune system.
2. Patients with thermal burns covering more than 20% of the body surface exhibit immunoregulatory disorders including a significant increase in pro-inflammatory cytokines, a decrease in anti-inflammatory and immunoregulatory cytokines, and a decrease in the number of regulatory T cells.
3. A significant improvement in the number of regulatory T lymphocyte populations and their activity were found in patients with extensive thermal burns who received the treatment of magneticfield magnetostimulation of Viofor.

4. In patients, a simultaneous reduction of pro-inflammatory cytokine activity and increase of anti-inflammatory cytokine activity were noted.
5. Immunocorrective changes contribute significantly to improving the clinical condition of patients.
6. The required use of antibiotics and / or steroids from 70% before treatment decreased to 30% after Viofor treatments.
7. "In vitro" studies confirm the immunocorrective effect of Viofor magneticfield magneticfield observed in the form of a decrease in the concentration of pro-inflammatory cytokines TNF- $\alpha$  and IL-8;
8. Viofor magneticfield stimulation do not disturb circadian cycles associated with melatonin secretion, which is crucial for natural immunity.

**We encourage reading the detailed information on how Viofor therapy can effectively solve patients' problems.**

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