Micro-immunotherapy
International Medical Experience

Boosting immunity with micro-immunotherapy

The natural protection against infections

This brochure is for doctors and other health professionals only

General immune support through micro-immunotherapy

APPLICATION* OF THE FORMULAS EID & EID-N

*According to the experience of doctors of the International Associations of Micro-immunotherapy (MeGeMIT, AEMI and IFMi)

✓ Prevention of infections	1 capsule / day for 1-3 months
✓ Maintenance therapy until the end of the cold season	1 capsule / day 10 days / month
✓ In acute infection until symptoms improve	2-3 capsules / day then reduce slowly
✓ In recurrent chronic infections	1 capsule / day for 3-6 months
✓ In immunodeficiency or lymphopenia / hyporeactivity	1 capsule / day for 3-6 months

- The formula EID has been shown to be highly effective in preventing winter respiratory infections.
- In patients with an inflammatory background, the formula EID is preferred over EID-N, as the latter is aimed at stimulating TH1 pathways.

IMMUNOREGULATORY OBJECTIVES

- ✓ Support the innate and adaptive immune response in bringing the infection under control
- ✓ Downregulate the mechanisms impairing or inhibiting the antimicrobial host defence
- ✓ Limit the excessive immune response to an infection and associated disorders

Introduction

The human body is constantly exposed to microorganisms, many of which cause diseases. However, the organism is equipped with the immune system, a complex defence system that acts as a protective shield against pathogens, foreign substances and body-own mutated or cancer cells. This complex network of organs, cells and immune messenger substances distributed throughout the body, is responsible for identifying and neutralising potential disruptive factors. At the same time, however, it must avoid attacking the body's own tissues, commensal bacteria and other harmless substances, such as allergens and nutrients. Through the balance between these two functions, defence and tolerance, autoimmunity is prevented and the integrity of the organism is maintained[1].

The proper functioning of the immune system is the basis of good health. If this complex defence system runs out of balance, the susceptibility to infections as well as their duration and intensity increase, favouring the onset and progression of other diseases[2].

By regulating the immune system, micro-immunotherapy, a low-dose immunotherapy, offers multiple solutions to various diseases and has proven to be especially effective in daily clinical practice as a general, non-specific immune support in case of infections.

Overview of the immune response to an infection

Dr Pascal Mensah (Palma, Spain)

An infection and the immune response it triggers can be divided into various stages, which are described in detail below.

Pathogens cross the barrier / Pathogens are identified and innate immunity's components are activated

Firstly, pathogens need to cross or bypass the body's main barriers against infections, the epithelial surfaces, i.e. the skin and the mucosa of the gut, lungs, eyes / nose / mouth and the urogenital tract. If pathogens succeed, they are then identified by the cellular (macrophages, dendritic cells, among others) and humoral components (e.g. the complement system) of innate immunity, and eliminated via mechanisms such as phagocytosis or cell lysis. Simultaneously, antiviral type I interferons and proinflammatory cytokines are released: interferon alpha (IFN-α) and beta (IFN-β), interleukin 1 (IL-1), tumour necrosis factor alpha (TNF-α), interleukin 6 (IL-6) or interleukin 12 (IL-12). These immune mediators trigger inflammation and boost the immune response, whereby other immune cells (neutrophil granulocytes, NK cells, among others) are recruited to the site of infection to support local immune cells in neutralising the pathogen. Innate immunity is usually sufficient to keep the infection under control[3,4].

Pathogens are identified and the components of adaptive immunity are activated

If this is not the case, the adaptive immune response, which is highly specific against pathogens, comes into play. Dendritic cells are activated upon internalising antigens in the infected tissue. Under the influence of proinflammatory cytokines, they mature into antigen presenting cells (APCs) and travel to the lymph nodes, where they present the antigens to naïve CD4+, CD8+ T cells and B cells. As soon as these cells identify their antigen, they activate, proliferate and differentiate into memory and effector cells (T helper cells or cytotoxic CD8+ T cells). There are various cytokines which play an important role at this point, such as IL-2.

B cells are also activated once they identify an antigen. Their interaction with T cells and cytokines such as interleukin 4 (IL-4), interleukin 5 (IL-5) or interleukin 6 (IL-6) stimulates them to proliferate and differentiate into antibody-producing plasma cells[3].

Pathogens are neutralised / eliminated

T effector cells and antibodies reach the site of infection via the lymphatic vessels and the bloodstream. There, the innate and adaptive immune response are coordinated by immune messenger substances, working together to bring the infection under control. T helper cells produce cytokines like interferon gamma (IFN-γ) in order to support other immune cells such as macrophages. Antibodies bind to antigens, neutralising the pathogens and boosting the function of innate immunity's cells and molecules. Cytotoxic CD8+ T cells identify virus-infected cells and eliminate them directly by releasing granzymes and perforin[3].

Regulation / Homeostasis

Upon neutralisation or elimination of the pathogens, the inflammatory response is resolved through anti-inflammatory cytokines such as transforming growth factor beta (TGF-β) or interleukin 10 (IL-10) and the defence reaction ends. This process comprises the apoptosis of proinflammatory cells and the elimination of

the cell debris by macrophages through phagocytosis. At the same time, the tissue is repaired and homeostasis is re-established[3,4,5].

Antigen-specific T and memory B cells stay in the body after primary infection. Thereby, in case of repeated infection or reactivation of the pathogen, the specific immune response can be initiated rapidly and efficiently[3].

However, despite this smart defence system, in some cases it is not possible to fight off pathogens rapidly and effectively, since these have developed multiple strategies to evade the immune response (e.g. inhibition of the immune response, induction of tolerance)[6]. In addition, the immune system can be impaired due to various factors such as lifestyle, environmental pollution, stress or age, thus making the body more susceptible to infections[7].

General immune support with micro-immunotherapy: Formulas EID / EID-N

Dr Petra Blum (Tegernsee, Germany)

Micro-immunotherapy is an immunoregulatory treatment mimicking the natural functioning of the immune system. It stands out as a valuable treatment option in case of infections. Its efficiency in both prevention and treatment has been proven for all types of infectious diseases. The formulas used to support immunity against infections are the formulas **EID / EID-N**.

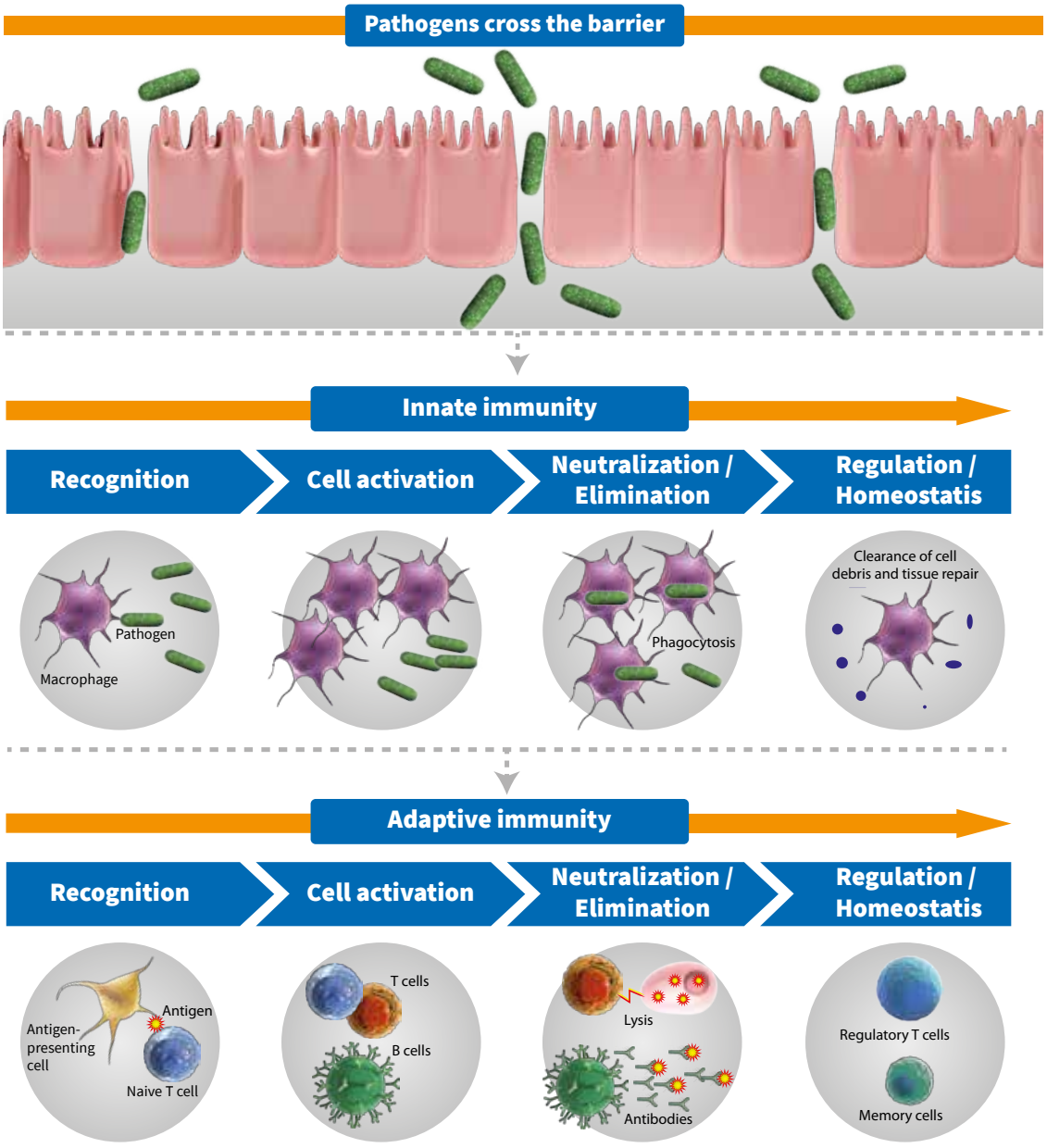

Fig. 1: Simplified scheme of the immune response against infections

Immunoregulatory objectives

The formulas EID / EID-N are composed of a specific combination of immunomodulatory substances in low doses (LD) and ultra-low doses (ULD). They are aimed at supporting immunity against pathogens to bring an infection under control by acting on the overall system with multiple objectives:

- Support innate and adaptive immunity in bringing the infection under control
- Downregulate the mechanisms which impair or inhibit the antimicrobial defence
- Limit the excessive immune response to an infection and associated diseases

Fields of application

The following are among the fields of application of the formulas EID / EID-N:

- Prevention of infections
- General immune support in case of acute, chronic or recurrent infections (especially of viral origin)
- General immune support in case of immune deficiency or non-adaptation with lymphopenia / hyporeactivity in the lymphocyte typing

Dosage

- The dosage for preventing infections (especially winter infections) is 1 capsule / day for 1-3 months. Thereafter, a maintenance dose of 1 capsule / day during 10 consecutive days per month may be taken until the end of winter.
- As a support in case of chronic or recurrent infections as well as immune deficiency or non-adaptation with lymphopenia / hyporeactivity in the lymphocyte typing, the dosage of the formulas EID / EID-N is 1 capsule / day for 3-6 months (depending on the clinical picture).
- The dosage may be increased in case of acute infection: 2-3 capsules / day throughout the day until symptoms improve.

Clinical benefit

Clinical experience has shown that micro-immunotherapy is a specially valuable asset for the prevention and treatment of infections in daily clinical practice. The following therapeutic effects could be observed in the majority of cases:

- Patients (both children and adults) taking micro-immunotherapy preventively show a more stable immune system.

What is micro-immunotherapy?

Micro-immunotherapy is an immunotherapy aimed at recovering and/or sustaining immune competence in the long term. It uses immunomodulatory susbtances in low doses (cytokines, among others), thus communicating with the immune system in its own language without replacing it or blocking its functions. Local and systemic action is achieved in a sequential and coordinated manner. This way the body's physiology is mimicked and unwanted side effects are avoided (Fig. 1).

COMMUNICATES
with the immune system in his own language, by making use of substances like cytokines and other immune mediators in low doses.

MIMICS
the chain of natural immune reactions, by following a specific sequential action.

RETRAINS
the immune system to respond appropriately to internal and external disruptive factors, thus resulting in long-term immune regulation.

Fig. 1: Summary of the mode of action of micro-immunotherapy formulas

Practical advice:

Micro-immunotherapy can also be of help in SARS-CoV-2 infections and associated consequences, both preventively and in the acute or post-COVID phase.

Access our Professional Area for more information on Micro-immunotherapy & COVID-19

Support innate and adaptive immunity in bringing the infection under control

EID	EID-N	
RNA DNA	RNA DNA	Promote pathogen recognition and production of type I interferons and proinflammatory cytokines
IL-1 TNF-α IL-6 IFN-γ	IL-1 TNF-α IL-6 IFN-γ GM-CSF G-CSF IL-3	Promote protective acute inflammation and the elimination of pathogens by macrophages and granulocytes
TNF-α	TNF-α GM-CSF IL-12	Support antigen presentation and the initiation of the adaptive immune response
IL-2	IL-2 IL-12	Promote the cytotoxic function of NK cells
IL-2 IL-6 IFN-γ IL-5	IL-2 IL-6 IFN-γ IL-12 IL-4	Support the innate immune response on the cellular and the humoral level

Downregulate the mechanisms impairing or inhibiting the antimicrobial defence

EID	EID-N	
TGF-β SNA®-HLA I	TGF-β SNA®-HLA I IL-10 SNA®-EIDa-02 SNA®-EIDb-02	Limit immunosuppression / tolerance and the progress of infection

Limit the excessive immune response to an infection and associated diseases

EID	EID-N	
SNA®-HLA II SNA®-EID	SNA®-HLA II	Prevent the overexpression of HLA molecules in non-professional APCs and excessive activation of T lymphocytes

Colour scheme:

Upregulation, maintenance and downregulation
of the biological activity of the substance in the body

Fig. : Immunoregulatory objectives of the formulas EID and EID-N

- In patients who previously suffered from recurrent infections, susceptibility to infections usually decreases after starting micro-immunotherapy. Should this not be the case, it is recommended to check on a potential burden of herpesviruses such as the Epstein-Barr virus (EBV) and, if a burden is confirmed, treat it with the corresponding micro-immunotherapy formula (formula EBV, amongst others). This approach has had positive effects on the course of treatment in many cases.
- There is a reduction in the duration and intensity of the symptoms in patients taking micro-immunotherapy during an infection. They recover sooner and without complications. Thus, the number of sick days decreases.
- Experience has shown that antibiotics can be avoided in most cases of mild infection without causing any infectious complications.

Difference between the formulas EID and EID-N

Both formulas provide general immune support in case of acute, chronic and recurrent infections as well as immunodeficiency. There are, however, some minor differences between them due to their specific composition. For example, the composition of the formula EID-N is more complex than that of the formula EID.

They both support cellular immunity. However, the formula EID-N promotes the TH1 pathway more strongly by upregulating TH1 cytokines such as IL-12 while downregulating TH1 cytokines like IL-4 and TH3 cytokines such as IL-10 and TGF-β. The TH1 pathway is crucial in the elimination / neutralisation of intracellular pathogens such as viruses.

Unlike the formula EID-N, the formula EID aims at maintaining balance between cellular and humoral immunity whilst dampening the inflammation associated with an excessive concentration of TH1 cytokines.

The formula EID has proven beneficial for the prevention of winter infections both in children and adults. It is of great value as an immune supportive treatment in any type of infection. In patients with an inflammatory background, the use of the formula EID is preferred over EID-N, as the latter is aimed at stimulating TH1 pathways.

Combining the formulas EID and EID-N with other micro-immunotherapy formulas

The formulas EID / EID-N should not be combined with formulas that have an antiinflammatory or dampening effect on immunity, like the formulas ARTH or INFLAM and EAI, since they have opposite objectives.

Conclusion

The correct functioning of the immune system is the basis of good health. Hence it is important to relieve this complex network from disrupting factors as far as possible and strengthen its resilience so it can adapt to internal and external challenges in a flexible way, reacting to them appropriately. Micro-immunotherapy is a valuable treatment option as it regulates the immune system in a gentle, targeted and sustainable way. It has proven to be effective in patients with immunodeficiency and in the prevention and treatment of infections of all types in daily clinical practice. The treatment is aimed at supporting the natural defence mechanisms in their fight against pathogens so as to bring the infection under control. Many patients have reported about a more stable and effective immune system upon starting micro-immunotherapy: the affected experience milder symptoms and recover faster. In most patients with recurrent infections, susceptibility to infections decreases with micro-immunotherapy. A gentle immune booster, micro-immunotherapy provides natural protection against infections for the whole family.

Studies

In vitro and in vivo study:

Immunostimulatory effect of the micro-immunotherapy medicine 2LEID®

In vitro study:

Immunostimulatory and immunomodulatory effect of IFN-γ in LD

Literature

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