

# Therapeutic use of immunoglobulins

**Immunoglobulins** are among the basic components of a specific immune response.

## Distribution of immunoglobulins used

- **homologous immunoglobulins** - obtained from the plasma of healthy donors. They are divided into:
  - polyclonal antibodies,
  - monoclonal antibodies.
    - examples: Zevalin (non-Hodgkin's lymphoma), Rituximab (lymphomas), Infliximab (Crohn's disease, rheumatoid arthritis)
- **heterologous immunoglobulins** - derived from the plasma of immunized animals

## Use of immunoglobulins in medicine

### Substitution therapy

When immunoglobulins are deficient or dysfunctional, they need to be substituted to boost the body's immunity. Diseases in which immunoglobulin substitution is used:

- **primary immunodeficiencies** - diseases caused by a defect in the gene encoding a protein involved in a specific immune response. This may be a deficiency of one class of Ig or the whole spectrum. In these diseases, immunoglobulins need to be substituted for life.
  - Bruton's agammaglobulinemia
  - Wiskott-Aldrich syndrome
  - Common Variable Immunodeficiency
  - Hyper-IgM syndrome
- **secondary immunodeficiencies** - reduced immune response of the body due to other causes (diseases, immunosuppressive drugs... ). Of the secondary immunodeficiencies, replacement therapy is most commonly used for:
  - chronic lymphoid leukemia (CLL),
  - multiple myeloma.

It is essential to treat and address the primary cause. In secondary immunodeficiencies, immunoglobulins are only substituted for a period of time until the desired level is reached. Other such diseases where Ig substitution is used include:

- children with congenital AIDS,
- in bone marrow transplantation,
- in immunosuppressive therapy.

### Immunomodulatory therapy

Immunomodulatory therapy is mainly used in the treatment of **autoimmune neuromuscular diseases** in which an autoimmune process causes progressive damage to peripheral nerves, neuromuscular discs or striated muscles. Application:

- Guillian-Barré syndrome,
- multifocal motor neuropathy,
- myasthenia gravis,
- multiple sclerosis.

### Other uses

Immunoglobulins are being used more and more nowadays. Their other uses are, for example, in septic conditions or transplantation.

## Ways of application

### Subcutaneous

The advantage of subcutaneous administration is the possibility of administration in the home environment. The rate of administration should be max 30 ml/hr, administered max 90 min. It is necessary that the distance between the two application sites is min 5 cm.

### Intramuscular

Disadvantages are slow absorption, pain and inability to administer high concentrations. For amounts greater than 5 ml, the dose should be divided into multiple sites.

## Intravenous

For intravenous administration, a visit to a healthcare facility is required. The advantage is the ability to administer higher doses. It is mainly used in the elderly and in patients where frequent applications are inconvenient.

The difference between SCIG or i.m. administered IG and IVIG is the presence of immunocomplexes and the limiting IgA concentration. There is a risk of shock with i.v. administration.

## Adverse effects

Immunoglobulins, like any medication, can cause adverse effects up to a life-threatening condition. They can be:

- **immediate** - reminiscent of flu symptoms (headache, muscle pain, nausea, malaise...),
- **late** - rare effects (renal failure, thromboembolism, neutropenia... ),
- up to **anaphylactic reaction** - administer adrenaline in combination with hydrocortisone.

## Links

### Related articles

- Antibody
- Auto-antibody
- Immunosuppressants

### External links

- HOŘEJŠÍ, Václav - BARTŮŇKOVÁ, Jiřina. *Základy imunologie*. 3. edition. Praha : Triton, 2005. ISBN 80-7254-686-4.
- STRAŠÍK, Slavomír. Imunoglobuliny a jejich terapeutické použití. *Praktické lékařství* [online]. 2014, y. 10, p. 233-237, Available from <<http://www.praktickelekarenstvi.cz/pdfs/lek/2014/06/10.pdf>>.