

Antibody Index in neuroimmunoepidemiological studies

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ABSTRACT

The evaluation of the neuroimmunoepidemiological response from the reibergram allows the determination of the specific antibody index for a determined etiological agent. This evaluation has served to know the behavior of the neuroimmune response in pediatric patients to different herpesviruses, evaluate the effectiveness of vaccination campaigns and find a response that helps in the diagnosis of various processes that affect this system.

Keywords: antibody index; Reibergram; neuroimmunology.

INTRODUCTION

Neuroimmunoepidemiology is nourished by the sciences that integrate it to associate neurological diseases with the epidemiological framework where they occur. The

most common studies of the central nervous system (CNS) with an immunological profile are associated with vaccine-preventable diseases. In the inflammatory processes of the CNS, a polyclonal and polyspecific activation occurs at the level of the cerebrospinal fluid (CSF). In the mechanism of inflammation, there is an activation of memory clones with information before infectious microorganisms that the individual has previously been in contact with them. This activation occurs from the first days and can remain for long periods.^(1,2,3,4)

So when we confirm through the Reibergram the presence of intrathecal synthesis of immunoglobulins (Ig) we can determine the antibody index (AI) that allows us to know against what specific etiological agent a humoral immune response has been established.⁽⁵⁾

DEVELOPING

As a basic aspect in the immunological reactions in the CSF, the predominantly oligoclonal intrathecal humoral immune response is polyspecific. Together with the specific antibodies against the causative agent, the Ig dominant fraction, typically IgG, has many other different antigenic specificities 6. Therefore, in order to detect more sensitively and quantitatively the increased intrathecal synthesis of a specific antibody, the calculation of the AI.⁽⁵⁾

If the AI is greater than or equal to 1.5, it indicates the local synthesis of the antibody evaluated, if the method used for the quantification of specific IgG values against viral agents is of the immunoenzymatic type.^(3,5)

We must differentiate two cases in which we can find altered values of the AI. A first case, in which the antigen against which the antibodies are detected comes from the etiological agent of the disease and a second case, in which a secondary and polyspecific response occurs without the persistence of the antigen or specific clinical signs of infection. The latter is typical of multiple sclerosis and other chronic neurological diseases, such as the later stages of human immunodeficiency virus (HIV) encephalitis or chronic Lyme disease.^(3,5,6)

In a study entitled Intrathecal synthesis of IgG against herpesviruses as neuroimmunoepidemiological evidence in pediatric patients, AI was used as a tool to evaluate the intrathecal humoral immune response to cytomegalovirus (CMV), varicella-zoster virus (VVZ) and herpes simplex virus (HSV).⁽⁷⁾

In this work, samples of CSF and sera from 85 children was evaluated, and Ig levels were quantified through immunoenzymatic assays. The corresponding reibergrams were constructed and it was determined that they had intrathecal immunoglobulin synthesis. The determination of the specific AI for these three herpesviruses.⁽⁷⁾

The results of the AI against CMV, VVZ and HSV allowed identifying the neuroimmunoepidemiological situation of the population studied. There were no statistically significant differences in AI between the different groups of established ages, which translates the early exposure to them and the presence of a specific antibody response against these herpesviruses, which does not change despite the fact that the child is growing and therefore you must have a greater exposure to them.⁽⁷⁾

Another example would be the study Neuroimmunological approach for evaluation of viral measles, mumps and rubella (MMR) triple vaccines where an explanation could be found to the finding of isolated cases of mumps in Cuban patients immunized with the triple viral vaccine that must guarantee immunity against measles, rubella and mumps.⁽⁸⁾

The authors, using AI, were able to identify that the antibody response against mumps was significantly different with respect to the other two components of the viral triple vaccine, which could be a natural immune response or a deficiency in the quality of the vaccine lot applied.⁽⁸⁾

CONCLUSIONS

The AI has proven to be a very useful tool that allows identifying the specificity of an antibody when intrathecal synthesis of it occurs so it can be used in the evaluation of different population groups.

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