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Activation of the Immune System by Irresponsible use of Modeling Substances

Short communication

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Abstract

The immune system is the set of cells, tissues and organs of the body responsible for fighting infections and diseases. It distinguishes between what is self and what is foreign and eliminates potentially harmful foreign molecules and cells from the body. It can also recognize and destroy abnormal cells derived from the host's tissues. Any molecule capable of being recognized by the immune system is considered an antigen. Its integrity depends on a perfect balance between all vital functions and any external environmental agent can break this balance [1].

There is a growing tendency to rejuvenate without scars. At the same time, culture and fashion impose forms of body beauty that involve volume increases in buttocks and breasts, whose least invasive way of achieving this is through the injection of modeling substances. Despite the multiple regulations established so that these fillers do not end up in voids as a result of complications, intruders persist who unscrupulously inject synthetic substances that stimulate the immune response [2].

When a modeling substance is injected, the immune system identifies it and activates the innate immune response, triggering a type IV hypersensitivity mediated by $CD4^+$ T lymphocytes with a Th1-type response that increases the production of cytokines such as interferon gamma or tumor necrosis factor, which will activate macrophages and CD8 T lymphocytes to produce direct cell injury through cytotoxicity. Macrophages, dendritic cells and antigen-presenting cells begin to phagocytose the particles of the injected substance and attempt to encapsulate them; however, the phagocytosis process is not always effective due to the chemical and physical nature of the injected material. Unable to degrade or eliminate these substances, macrophages release proinflammatory cytokines, such as tumor necrosis factor alpha, interleukins 1 and 6, as well as chemokines that attract more immune cells to the injection site [3].

On the other hand, the body's inability to eliminate foreign material leads to the formation of granulomas, which consist of epithelioid cells, multinucleated giant cells, activated macrophages and lymphocytes with a Th1 response. This immune response causes the release of substances that can extensively damage tissues, affecting muscles and subcutaneous cellular tissue, leading to the presence of myositis due to the infiltration of polymorphonuclear cells into the muscle. Furthermore, invasion of lymphatic vessels allows migration of the material to other areas, causing lymph node swelling, involvement of nearby nerves, and secondary lymphedema [3]. The persistence of the modeling substance in the body leads to chronic inflammation, which can damage surrounding tissues and cause fibrosis, often resulting in the formation of dense capsules around the injection site, which can harden, cause pain, generate aesthetic deformities, and limit the mobility of the affected tissues, along with the development of systemic autoimmune diseases of the connective tissue. Nonspecific autoimmune phenomena may also occur, including the production of antibodies and activation of the complement system [2].

In some cases, the local immune response may lead to the development of systemic effects. Inflammatory cytokines released at the injection site may enter the bloodstream, causing systemic symptoms such as fever, fatigue, or a generalized immune response. Furthermore, the migration of the injected material to other parts of the body can lead to the formation of granulomas and fibrosis in distant sites [4,5]. In Cuba, between July 2017 and July 2022, 227 patients with iatrogenic allogenesis were reported. Cases with ASIA syndrome [6], IgG4 disease [7] and fibromyalgia symptoms [4] have been diagnosed, which were reversed after surgical removal of the modeling substance; however, this therapeutic method always leaves deforming sequelae. Although the removal of the modeling substance can improve the symptoms, the activation of the immune system is irreversible, so it must be taken into account as a differential diagnosis of connective tissue diseases, rheumatological and immunological entities, as it can modify the results of diagnostic markers that constitute false positives. For this reason, when symptoms are triggered by this cause, treatment should be carried out by a multidisciplinary team that involves the plastic surgeon, the immunologist and the psychologist, where the most important thing is to keep it in mind as the probable cause of the clinical expression of an autoimmune phenomenon with an antigen-antibody reaction that could be perpetuated [8-10].

It should be noted that the modeling substance behaves as an external agent that, in genetically predisposed subjects, can trigger autoimmune phenomena with variable clinical expression, so, in the case of a new case with a nonspecific clinical picture suggestive of compromised autoimmunity, it is essential to verify the history of the injection of synthetic filler substances.

Conflict of Interest

The author declares that she has no conflict of interest.

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