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Elderly people practitioners of a combined exercise training shows improvement of specific antibodies in response to influenza virus vaccination

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ELDERLY PEOPLE PRACTITIONERS OF A COMBINED EXERCISE TRAINING SHOWS IMPROVEMENT OF SPECIFIC ANTIBODIES IN RESPONSE TO INFLUENZA VIRUS VACCINATION

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Aging process is a multifactorial phenomenon characterized by a decline in many physiological compartments, including the immune system, which is named immunosenescence. Among several changes in the immune response associated with aging there is a greater susceptibility to infection and reduced response to vaccination⁽¹⁾. Although it is widely accepted that regular physical exercise practice, particularly of moderate intensity, can minimize some aspects of immunosenescence⁽²⁾, the effects of combined exercise training, involving aerobic and resistance physical exercises is poor understood. Therefore, in this study, we evaluated the levels of specific antibodies (IgM and IgG) in response to influenza virus vaccination, TNF-alpha serum concentration and the absolute number of naïve TCD4⁺ cells in elderly people who practice or not a regime of combined exercise training. Thirty-eight elderly individuals (aged = 67.4±5.5), men (n=6) and women (n=32)) were recruited to participate and, afterwards, they were separated in two groups: sedentary group (SE, n=19, aged = 67.9±6.7) and physical exercise group (PE, n=19, aged = 67.1±4.3). Combined exercise training was composed by aerobic and resistance exercises performed in a moderate intensity. All the volunteers received the same vaccine against influenza virus. Blood samples were collected before and 30 days after vaccination. Both groups presented similar physical characteristics. We observed that PE group presented higher serum IgM and IgG levels after vaccination when compared to the values obtained before vaccination. Furthermore, after vaccination, PE group presented raised serum IgM levels when compared

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to SE group. Concerning serum TNF-alpha concentration, the values observed in PE group were significantly reduced in comparison to the values observed in SE group. On the other hand, the absolute number of naïve TCD4⁺ cells in PE group was higher than in SE group. It has been demonstrated that elevation in TNF-alpha levels are related to TCD4⁺ cells apoptosis, especially naïve T cells⁽³⁾, leading to the impairment of the immune response to new antigens. Taken together, our results show that elderly people who practice combined exercise training regularly can improve IgM and IgG antibody levels in response to influenza virus vaccination. This effect occurs due to the reduction of serum TNF-alpha concentration and the maintenance of naïve TCD4⁺ cells number.