

EVIDENCE OF CYTOKINES LEVELS MODULATION IN RAT SERUM EXERTED BY IACVITA, A NEW ANTIOXIDANT COMPUND

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It is well accepted that free radicals play an important role in biological systems. They contribute to energy homeostasis of cells and they act as regulatory mediators in signaling pathways. Reactive oxygen species (ROS) and nitric oxide (NO) are involved in many physiological functions such as the regulation of vascular tone and defensive mechanisms used by phagocytic cells to kill pathogens. However, excessively high levels of ROS can be dangerous for cellular constituents and lead to DNA damage and lipid peroxidation. The generation of ROS seems to be an obligate step in the intracellular pathways which lead to T cell activation and interleukins secretion, such as IL2. Moreover, activated T cells generate free radicals and cytokines themselves leading to the activation of immune cells and a cascade of molecular events resulting in the amplification of the inflammatory process. In the organism ROS are eliminated by specific enzymes and antioxidant molecules called “radical scavengers” to avoid ROS-associated cell damage due to both endogenous stimuli and the excessive activation of immune cells. In this study we examined the ability of a new molecule, the bis(1-hydroxy-2,2,6,6-tetramethyl-4-piperidiny)-decandioate (IACVITA, MEDESTEA Intl.), originally used for quantitative measurements of ROS in biological systems, to interfere with cytokine or superoxide production during inflammation. Our previous data indicated that IACVITA was able to reduce the carrageenin-induced inflammation in rat.

Our results showed that the compound exerts either an antioxidant activity or a modulation of interleukin levels. In particular micromolar concentration of IACVITA showed an antioxidant activity on menadione 3T3 fibroblast treated cells. However the compound was unable to reduce the toxicity elicited by menadione concentration higher than 8 μ M. The results obtained on the modulation of cytokines pathway by 50mg/Kg of IACVITA in rat carrageenin-inflammation model, showed a significant decrease in serum level of IL-2. This decrease was similar to the one observed in rats treated with indometacina used a positive control. The others cytokines tested did not showed any significant variation compared to the no-treated one.

These results suggest that the anti-inflammatory action exerted by IACVITA could be ascribed to a synergic effect between its intrinsic antioxidant properties and its ability to reduce IL-2 levels in activated immune cells.