ABSTRACT

The aging of the skin and the vast majority of organs is characterized by a progressive loss of functionality and regenerative potential and, consequently, the progressive loss of collagen and other proteins and structures present in the skin. With advancing age, a low-grade chronic inflammation called inflammaging is triggered. It is characterized by serum levels of inflammatory cytokines, such as IL-6, IL-8 and TNF-α, which are not limited to age-related systemic changes, but may also be related to skin aging.

For more than twenty years, the fractional CO2 laser, also known as the fractional carbon dioxide laser, has been implemented in surgical and aesthetic practice. Its main function is to trigger collagen denaturation, responsible for tissue contraction (often visible during the procedure) and for the improvement of wrinkles and sagging after treatment. Unlike the action of high-intensity lasers, photobiomodulation (FBM) differs in that it causes varying degrees of excitability that do not lead to the destruction of chemical bonds in the target tissue, it acts mainly on the mitochondria, stimulating the production of energy in the form of adenosine triphosphate (ATP), has the ability to delay, accelerate or inhibit biological responses which can increase cell metabolism and produce effects such as analgesia, tissue repair, among other effects. Therefore, the objective of this study is to evaluate the role of photobiomodulation (FBM) in the inflammatory process and to verify if it is reduced with the use of FBM, collagen production can be reduced and thus the result is impaired. On the other hand, if FBM does not interfere with collagen generation despite the reduction in inflammation, its use can help to minimize the exacerbated inflammatory effects after some types of procedures.

KEYWORDS: Fractional CO_2 laser; Photobiomodulation; Inflammation; Colagen; Skin; Rat.