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TILAPIA SKIN (OREOCHROMIS NILOTICUS) DRESSING PROMOTES IMPROVEMENTS IN THE HEALING PROCESS OF EXPERIMENTAL BURNS

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Background:

Burns affect more than 300 million patients a year worldwide and they are the fourth leading cause of death in children in Brazil. Tilapia Skin (*Oreochromis niloticus*) has microscopic characteristics similar to the morphological structure of human skin and it has high tensile strength. We hypothesize that tilapia skin could potentially be a therapeutic target as biomaterial to apply in wound burns.

Objective:

This study aims to evaluate the effect of Tilapia Skin (TilSk) on experimental burns.

Methods:

Adult female mice (20-25g) were subjected to the experimental burning protocol (1.5x1.5 cm/6s/100°C) and divided into three groups: Control, TilSk or Silver Sulfadiazine (approved by animal ethics committee/UFC No. 7304051018). Samples of the lesions were collected for quantification of inflammatory mediators (mean±SE), macroscopic evaluation and histological analyzes after 3, 7 and 14 days of treatment. Statistical differences were determined by ANOVA/Tukey, in which $p < 0.05$ were considered significant.

Results:

TilSk modulated the inflammatory response, attenuated the harmful progression of the burn and favored tissue repair. The dressing reduced myeloperoxidase (MPO) activity ($p < 0,01$) and attenuated the release of IL-1 β ($p < 0,05$), TNF- α ($p < 0,05$) and IL-8 ($p < 0,01$). In addition, IL-10 ($p < 0,05$) levels were higher in TilSk compared to the Control. Macroscopic analysis showed lower tissue damage and higher degree of lesion contraction after 3 and 7 days of treatment with TilSk, respectively. In this sense, histological data showed reduction of chronic inflammatory infiltrate, absence of ulcer and presence of new epithelium after 7 days. Finally, TilSk promoted higher release of TGF- β ($p < 0.001$) compared to control after 14 days of treatment.

Conclusion:

The treatment of experimental burns with the tilapia skin dressing softened the inflammatory response and promoted better wound healing. This biological dressing has healing potential for burns. Therefore, this innovative therapeutic approach may improve the quality of lives of many children dealing with burn health issues.