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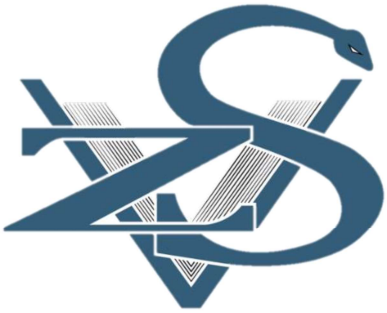


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CLINICAL EVALUATION OF THE EFFECTS OF NOVEL POLYVINYL ALCOHOL/GENTAMICIN (PVA/GENT) AND POLYVINYL ALCOHOL/CHITOSAN/GENTAMICIN (PVA/CHI/GENT) HYDROGELS ON THE HEALING OF SECOND-DEGREE BURN WOUNDS USING A RAT ANIMAL MODEL

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New therapeutic agents for burn treatment are constantly developed and their efficiency is tested on animal models in preclinical studies. The aim of our study was to clinically evaluate the effects of novel PVA/Gent and PVA/CHI/Gent hydrogels on the healing of second-degree burns, using a rat animal model.

Thermal injuries were induced in 48 male 3-month-old Wistar rats according to the protocol developed by Tavares Pereira et al. (2012). Animals were then randomly divided in the control group and two groups treated with hydrogels. The experiment was approved by the veterinary directorate (decision number 323-07-04903/2022-05/1). The clinical evaluation was done on days 3, 7, 14 and 21, and based on the wound contraction and semi-quantitative assessment of the following parameters: blistering, edema, redness, crust, bleeding, secretion, and scar tissue. Parameters were graded on a scale from 0 (absent) to 3 (severe).

On the 21st day wound contracted by 83.68 ± 1.30% in all animals. On the 3rd day redness and secretion were the most noticeable parameters. However, redness was absent in 20% of the treated groups animals compared to the 12.5% of the control group animals, and secretion was absent in 57.14% of treated groups animals compared to 25% of control group animals. On the 7th day the crust was noticeable in 97.29% of all animals, but it was graded higher (2) in 16.21% of treated groups animals compared to the 8.33% of control group animals. On the 14th day the crust was still present in 88.88% of all animals. Scar tissue was present in 65% of control group animals, all animals from PVA/Gent treated group, but only in half of animals from PVA/CHI/Gent treated group. On the 21st day scar tissue was present in all animals, and graded as mild.

Both novel hydrogels show potential in improving the healing of second-degree burns, but further histological analysis is needed to gain insight in the process of tissue reparation and advantages of each hydrogel.

Tavares Pereira, D.dosS., Lima-Ribeiro, M. H., de Pontes-Filho, N. T., Carneiro-Leão, A. M., & Correia, M. T. (2012). Development of animal model for studying deep second-degree thermal burns. Journal of biomedicine & biotechnology, 2012, 460841. https://doi.org/10.1155/2012/460841