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A new, easy-to-make, Pectin – Honey hydrogel enhances wound healing in rats

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The use of honey in wound healing is ancient. It could be used alone or in combination with other compounds and became a topic of interest in several investigation in last decade [1-2]. Pectin has been recently investigated for various biomedical applications, such as drug delivery, skin protection and as scaffold for cells [3]. Pectin is inexpensive, can be extracted from renewable sources, is not cytotoxic, acts as a gelating agent, and is suitable for many biomedical applications [4]. The aim of the present study was to develop and evaluate a pectin-honey hydrogel (PHH), forming a membrane applicable on the wound, and to compare this dressing to liquid honey for wound healing.

Thirty-six adult male Sprague-Dawley rats were anesthetized and a 2x2 cm full thickness excisional model was used to create the wounds [5]. Animals were randomly assigned to four groups (PHH, LH, Pec and C). Pectin-honey hydrogel was applied under a bandage on the wound (group PHH), liquid Manuka honey was applied under a bandage on the wound (group LH), pectin only hydrogel was applied under a bandage on the wound (group Pec), while in C group only the bandage was applied to the wound. Images of the wound were taken on days 0,2,4,6,8,11,13,15,18,21 and 23 after surgery. The comparison between the area at day 0 and at the time-set days was used to calculate the ratio of the wound reduction and compared between groups.

Wound area reduction rate was faster for PHH, LH and Pec group compared to the control group and among PHH, LH and Pec even significantly faster for the PHH group. Surprisingly Pec group had a faster wound healing than LH, even if was not statistically significant.

This is the first study, to date, to use pectin in combination with honey to produce biomedical hydrogels for wound treatment. Considering the results obtained in the present study, the use of PHH is effective to promote and accelerate wound healing.

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