

Effect the liquid extract of *Calendula officinalis* in surgical wound healing process in the abdomen of mice.

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Abstract

Twenty-eight male Wistar rats were divided in two groups: Control Group (CG) - underwent incision and suture; and Incision and + COE Group (COEG) - underwent incision, suture and intraperitoneal administration of *Calendula officinalis* extract (150 mg / kg). On the third and seventh days after surgery, samples of incisional wounds were collected for immunohistochemical and tensile tests. The effectiveness of using liquid extract of *Calendula officinalis* has been shown to increase the limits of resistance and break in incisional wounds. Immunohistochemical tests are being performed.

Key words: *Incisional hernias (IH)*, *metalloproteinases*, *Calendula officinalis*

Introduction

The occurrence of incisional hernias (IH) ranges from ten to fifteen percent of patients undergoing laparotomy, what is attributed to higher expression of matrix metalloproteinases (MMPs) 1, 2 and 13, whose substrates are collagen protein components of the extracellular matrix of tissues. Another factor associated with IH in laparotomy is the decrease of ratio of collagen type I and type III, which was associated with a marked expression of MMP-2 [1, 2].

Therefore, studies indicate that reducing the expression of MMPs, occurrences of IHs are minimized, and this can be done using drugs [2].

Thus, the objective of this project was to evaluate the effectiveness of the liquid extract of *Calendula officinalis* in the healing of surgical wounds [3].

Results and Discussion

Ethical approval for this research was obtained from the Research Ethics Committee of Campinas State University – UNICAMP. Twenty-eight male Wistar rats were distributed into two groups: Control Group (CG) - underwent incision and suture; Incision and + COE Group (COEG) - underwent incision, suture, and intraperitoneal administration of the liquid extract of *Calendula officinalis* (150 mg / kg). On the third and seventh days after surgery, samples of incisional wounds were collected for immunohistochemical tensile tests.

Results of tensile tests are shown in Table 1, and Tukey test ($p < 0.05$) was used to compare the means.

Tabel 1. Results to tensile test – (1) resistance limit, N; (2) displacement at resistance limit (mm); (3) stiffness, (kN m^{-1}); and break limit (N)

Group	(1)	(2)	(3)	(4)
CG ($n = 6$) (3rd. day)	4.18a	5.06a	8.52a	0,98a
COEG ($n = 6$) (3rd. day)	10.06a	9.94a	2.09a	2,30b
CG ($n = 6$) (7th. day)	12.21b	5.65b	5.57b	2,44c
COEG ($n = 7$) (7th. day)	17.52c	5.97b	6.11b	3,51d

Notes: Means labelled with the same letter are not significantly different from each other following the Tukey test ($p < 0.05$).

Conclusions

According to the experiments, the use of liquid extract of *Calendula officinalis* increased the limits of resistance and break in incisional wounds.

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