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Comparative Analysis of the Use of CMR Pomade (*Bellisperenis* + *Calendula officinalis* + *Myristicasebifera)* and Physiological Solution in Tissue Scarring of Rats (*Rathusnorvegicus)*

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Abstract

The pharmaceutical market offers several types of pomades used on animals in tissue scarring processes from traumatic injuries or surgical procedures. The use of homeopathic medication in treating skin injuries has grown significantly, notwithstanding the lack of information on the efficiency of such medications. This article intends, therefore, to evaluate the efficiency of the CMR pomade (*Bellisperenis* + *Calendula officinalis* + *Myristica sebifera)*, as compared to physiological solution, in the treatment of skin injuries on rats. Rats were wounded following same pattern on both sides of the shoulder regions (right and left), and healing procedures assessed scarring potential for both the CMR homeopathic pomade and physiological solution.

Keywords: Scarring, CMR, Homeopathy, Rats, Skin.

Introduction

Skin is the largest organ of the body, a complex structure that covers the whole area, constituting 15% of body weight, besides being an important barrier, protecting against external aggressions (GONÇALVES, 2013). Skin, however, is easily injured as it is the first interface between the body and the external environment, constantly suffering traumas, ultraviolet radiation, pathogenic factors as well as being a common area for tumors. (MACLEOD; HAVRAN, 2011; GONÇALVES, 2013).

Injuries may be caused by external factors such as surgery and accidental lesions or by means of internal factors such as infections and chronic ulcers. (WENDT, 2005) Mending, or scarring, of injured tissue, can occur in two ways: spontaneously, known as first intention, or, when lesions are large and infected with extensive tissue damage and borders that won`t remain sealed known as second intention. Both mechanisms follow the same process with quantitative rather than qualities differences. (BECKER, 1997; MARTINEZ-HERNANDEZ, 1999, NITZ, *et al. 2006*). Healing of injuries starts with inflammatory response characterized by increase in blood flux, capilar permeability and the migration of leucocites to injured area. (EURIDES, *et al.* 1996) According to Kent loyd, 1992, the biological process of healing begins upon loss of integrity, initiaty a series of events that includes subjacent areas and depends on several chemical reactions corresponding to first intention, second intention, primary closure or retarded closure depending on type of injury, location, contamination and tissue feasibility. Thus is established the series of cellular, molecular, physiological and biochemical phenomenon, successive and inter-related, that, by means of chemiotaxis, neovascularization, proliferation, deposit and reorganization of the extracellular matrix leas to the mending of the injury. (ALBUQUERQUE, 2005) Skin injuries represent one the the most frequent clinical occurrences of small animals. Exposed to risk factors such as being run over and fights with other animals, dogs are particularly prone to injuries, thereby often suffering extensive skin lacerations that may reach deeper structures and that may also culminate in varying degrees of contamination. (PAULO, 1997) Current studies have aimed at developing auxiliary methods towards scarring in animal skin injuries. Optional methods such as homeopathy and phitotherapy have shown benefits with satisfactory results in skin mending or scarring. According to Martins, 2010, "The use of phytotherapeutics has been widely used in healing surgical injuries, in finding active principles with an effective role in the scarring process, speeding surgery recovery." Amongst the plants studied with intrinsic activity in healing processes, special mention of the association between *Bellisperenis + Calendula officinalis + Myristica sebifera* (CMR pomade). The objective of this experiment was to evaluate clinically and histiologically the CMR pomade as an auxiliary towards the healing of skin injuries induced on mice, as compared to the use of physiological solution.

Methods

The animal used in the experiment was the albino of the *Ratthus norvegicus* species, easy to care and handle. Ten rats were selected, all male with approximately 260 grams each and considered healthy after clinical exams. The rats were submitted to general gas anesthesia with the application of the medication "isoflurano" at dose-effect quantities (Figure 1). Shaving of the back region of the animals was done with a common shaving blade, after which asepsis of the surgical area with a solution of alcohol at 70 per cent. Two cuts were made with a Punch of 2,5cm diameter on the right and left backsides of each rat (Figure 2). Treatment started immediately after injury and continued, once a day, till full scarring of injuries. Five animals were treated with the CMR homeopathic pomade and the other five with physiolofical solution so as to evaluate

results of both upon animals. Evaluation of scarring took place daily using interpretation of clinical aspects of injuries, scarring time and histo-pathological examinations. Injuries were measured daily with use of a digital pachymeter (Figure 3). The animals were kept in individual cages lined with newspapers regularly changed and standing food and water.

Figure 1. Animal submitted to anesthesic gas with Isofluorano.

Figure 2. Skin injuries on right and left backsides.

Figure 3. Sliding calliper rule, or pachymeter, used to measure size of injuries.

Results

During the first three days of the experiment, the size of injuries in both groups of rats was similar (Tables 1 and 2). Injuries were measured daily, both vertically and horizontally, with the digital calliper to ascertain exact measurements. Animal behavior was also observed during this period with normal clinical responses, drinking and eating. On the 4th day a slight decrease was observed in the injuries as well as alterations in the macroscopic characteristics of these injuries. The injuries treated with physiological solution were dry (Figure 4.), and with secretions from the 4th to the 6th day, injuries reduced rapidly in the first days, but full scarring of injuries with physiological solution was superior as compared to the homeopathic pomade. CMR pomade reduced scarring period by three days (tables 1 and 2) and injuries remained clean and free of secretions all through the experiment (Figure 5).

Figure 4. Lesion trated with physiological solution during mending.

Figure 5. Lesion treated with CMR during period of mending.

Table 1. Rat treated with physiological solution.

BACKSIDE / DAYS	RIGHT (mm)		LEFT (mm)	
0 (zero)	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL
1	10,0	10,0	10,0	10,0
2	9,20	9,45	9,34	9,87
3	8,97	9,40	7,86	8,46
4	7.53	9,00	7,03	7,10
5	6,35	8,65	6,60	7,01
6	5,33	7,26	5,54	6,28
7	3,82	5,56	3,14	4,03
8	3,51	5,54	2,72	3,71
9	3,22	3,45	2,33	3,09
10	2,06	2,20	2,14	2,71
11	1,31	1,40	1,86	1,73
12	1,12	1,28	1,71	1,59
13	0,96	1,04	1,34	1,09
14	0,64	0,72	0,96	0,75
15	0,23	0,38	0,49	0,41
16	0,00	0,05	0,11	0,27
17	0,00	0,00	0,09	0,12
18	0,00	0,00	0,00	0,03
19	0,00	0,00	0,00	0,00

Table 2. Rat treated with CMR Homeopathic pomade.

BACKSIDE / DAYS	RIGHT (mm)		LEFT (mm)	
0 (zero)	HORIZONTAL	VERTICAL	HORIZONTAL	VERTICAL
1	10,0	10,0	10,0	10,0
2	8,15	9,91	9,60	8,23
3	8,02	8,15	9,24	0,9
4	7,94	7,92	8,12	0,7
5	7,56	6,10	7,15	0,6
6	5,61	5,94	6,29	0,5
7	4,96	4,36	4,10	3,80
8	3,69	3,86	3,95	3,36
9	3,03	3,39	3,01	2,95
10	2,76	2,98	2,04	2,60
11	2,07	2,23	1,53	1,97
12	1,55	1,67	1,14	1,71
13	0,08	0,52	0,86	1,08
14	0,00	0,02	0,21	0,35
15	0,00	0,00	0,00	0,00

Conclusion

Considering the methodology applied, it may be concluded that the homeopathic pomade CMR showed satisfactory results in the mending and scarring of skin injuries as compared to physiological solution. However, physiological aspects of the animal should be considered thereby requiring further studies to determine the effectiveness of the CMR homeopathic pomade towards scarring of skin injuries.

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