

EVALUATION OF BURNS HEALING EFFECTS OF NATURAL HONEY, DERMAZINE CREAM[®] AND THEIR ADMIXTURE

¹MOMOH, Mumuni Audu, ²NWACHI, Uche Emmanuel and ¹ERAGA Sylvester

¹Department of Pharmaceutics, Faculty of Pharmaceutical Sciences, University of Nigeria, Nsukka

² Department of Biochemistry, Faculty of Biological Sciences, University of Nigeria, Nsukka

Corresponding Author: Momoh, M. A. Department of Pharmaceutics, Faculty of Pharmaceutical Sciences, University of Nigeria, Nsukka. Email: jointmomoh@yahoo.com Phone: +2348037784357

ABSTRACT

The healing effect of natural honey was evaluated in vivo using the excision wound healing model. Unpurified honey was used to treat burns inflicted on the experimental rats. The healing effects of the honey were compared to that of dermazine, honey-dermazine mixture, and methylated spirit. The burns healing agents all shown a progressive decrease in the wound, the healing effect of honey was more than any of the other agents used, with 100% healed in the 15th day, dermazine attained 100% by 21st day, indicating that natural honey has healing property than formulated dermazine, methylated spirit gives 61% by 21st day.

Keywords: Honey, Dermazine[®], Burns, Healing, Admixtures

INTRODUCTION

The therapeutic potential of uncontaminated, pure honey is grossly underutilized. It is widely available in most communities and although the mechanism of action of several of its properties remains obscure and needs further investigation, the time has now come for conventional medicine to lift the blinds off this 'traditional remedy' and give it its due recognition." Mostly this was in reference to reports of the use of honey as a wound dressing (Zumla and Lulat, 1989). The ancient usage of honey as a wound dressing has been reviewed (Beck and Smedley, 1944), but there have been only some very brief reviews, with little clinical detail, of the literature reporting modern usage of this rediscovered therapy for wounds (Wood *et al.*, 1997). Because of the increasing interest in the use of alternative therapies, especially as the development of antibiotic resistance in bacteria is becoming a major problem (Greenwood, 1995), and because of the increase in reported usage of honey as a wound dressing in recent times.

Honey is a highly concentrated sugar solution produced by honey bees, primarily from the nectar of plants. It is composed of carbohydrates (sugars), water, enzymes, amino acids, pigments, pollen, wax, and other trace constituents from both bees and plants. Honey has been used in the treatment of burns and wounds for many centuries, with documents describing this use dating back to 1700 BC.

A number of properties inherent to honey might contribute to its ability to fight infection and promote healing. Its high sugar content allows it to draw infection and fluid from wounds by a process called "osmosis." Honey prevents bacterial growth through its acidic pH and through the work of an enzyme that produces small amounts of hydrogen peroxide. Its ability to keep the area around a wound moist and protected promotes fast healing and prevents scarring.

Wound is defined as a break in the continuity of tissue from violence or trauma while healing is the restoration to normal condition especially of an inflammation or a wound it follows that wound healing has to do with the restoration of a break in the continuity of a tissue.

According to (Taber, 1965), wound healing is an important biological process that involves tissue repair and regeneration. Monocytes-derived macrophages are usually attracted to the site and these release a number of growth factors and cytokines which are important in maintenance of inflammatory reaction, irritation, maturation and control of wound healing process. Wound healing can be classified into any of three types- healing by first intention healing by second intention or healing by third intention, depending on the nature of the healed wounds. Neutrophils appear first in the wound to clear contaminating bacteria. Bacterial infection is the major factor affecting wound healing. Bacteria directly invade wound producing inflammation and fluid exudation, which interferes with healing. In addition, bacteria toxins cause tissue damage and delays fibroplasias as well as collagen synthesis (Thomas, 1997). When skin integrity in an animal is compromised by surgery or accidental trauma, infections agents have access into the wound to cause contamination and infection of the soft tissue locally. The infectious agents could also gain entry into the blood stream, which carries it to distant organs (Harris, 1994).

MATERIALS AND METHODS

Spatula, dermazine cream, methylated-spirit(KP), gauze (Agary), cotton wool (Tender), ethyl ether, razor blade, Bunsen burner, normal saline, Eusol solution were used for the study.

Animals: Mature Wister albino rats of both sex weighing between 120 – 180 g obtain from the

Table 1: Percentage reduction of burns in (mm)

Healing Agents	Day							
	0	3	6	9	12	15	18	21
Honey	(0%)	50%	60%	75%	95%	100%	-	-
Darmazine cream	0%	40%	55%	66%	84%	91%	94.5%	100%
Honey plus Darmazine cream	0%	52.5%	60%	70%	88%	100%	-	-
Methylated spirit	0%	10%	20%	22%	32.5%	47.5%	55%	61%

Department of Biochemistry, University of Nigeria and fed on 'check marsh' were used for the study. After the purchase, all the rats were allowed to equilibrate in standard and conditioned animal houses at the Department of Biochemistry, University of Nigeria for a period of two weeks before use.

Preparation of Burns Site in Experimental Animals:

The burns site was prepared following the excision wound model (Karl *et al.*, 2001). The animals were anaesthetised with diethyl ether and the hairs on the skin of the back, shaved with sterilized razor blades. A circle of diameter 15 mm was marked on each of the two sides of the skin surface. Then circular burns were then made on the marked areas of the skin surface with the aid of red-hot spatula. The area was measured immediately by tracing out the burned area using a transparent tracing paper and the squares counted.

Preparation of the Honey Extract: Honey was obtained from the comb of the beehive, *Apis mellifera* L. the honey was warmed to 80 °C and allowed to stand. The impurities which rose to the surface were skimmed off, and the liquid was passed through a calico. The clear viscous liquid so obtained was diluted with water to bring its viscosity to the Pharmaceutical codex standard of 1.355 to 1.360 g at 20 °C.

Treatment of Burns : Treatment started shortly after the burns was made by applying Honey, Darmazine, Honey plus Darmazine mixture and methylated spirit topically to the four groups of rats after dressing the wound with Eusol solution. The burn areas were measured while the animals were under anaesthesia on the 0, 3, 6, 9, 12, 15, 18, 21 day after the burnt.

Analysis of Data: The data were graphically analyzed using plot of wound diameter Vs healing rate. The student's t-test was also used to test the significance of the result obtained.

RESULTS AND DISCUSSION

The results of the healing effects of the various testing agents are presented in Table 1. There was a general decrease in burnt area upon application of the honey, darmazine and there admixture with time. By 3rd day 50 % of the burns have healed with honey and 100% healed by day 15th (Table 1). The group that received honey-darmazine gave 40 % healed by 3rd day and 100% day 15th. Darmazine gave 40 %

healed by 3rd day and 100 % at the 21st day, while methylated spirit dressing alone shows no much improvement within the first 15th day. The percentage wound healing effectiveness was as follows; honey, honey-darmazine, darmazine and methylated spirit (Table 1). It has been noted that dressing wounds with honey allows early grafting on a clean clear base.

Honey is also an ideal first-aid dressing material, especially for patients in remote locations when there could be time for infection to have set in before medical treatment is obtained: it is readily available and simple to use. It would be particularly suitable for first-aid treatment for burns, where emergency dousing or cooling frequently involves the use of contaminated water which then leads to heavy infection of the traumatized tissue. As well as providing an immediate anti-inflammatory treatment the honey would provide an antibacterial action and a barrier to further infection of the wound.

Gyang (1986) observed that rapid cleansing and chemical or enzyme debridement resulting from the application of honey to wounds have also been reported (Gupta *et al.*, 1992), with no scar forming on burns (Subrahmanyam, 1994). Several other authors have noted the cleansing effect of honey on wounds (Hutton, 1966). The result of this study is an indication that natural honey could be used as an alterative in wound dressing.

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