COMPARATIVE STUDIES BETWEEN HONEY AND FUCIDIN AS A LOCAL TREATMENT OF DIFFERENT SKIN ULCERS

Thesis

Submitted For Partial Fulfillment Of Master Degree In General Surgery

By

Maged Shokry Abdou

M. B., Ch. B

Under The Supervision of

Prof. Dr. Ibrahim Shamekh Mohamed

Professor of General Surgery- Breast Surgery

Faculty of Medicine

Ain Shams University

Dr. Samy Ahmed Abd El-Rahman

Lecturer of General Surgery

Faculty of Medicine

Ain Shams University

Faculty of Medicine

Ain Shams University

1998

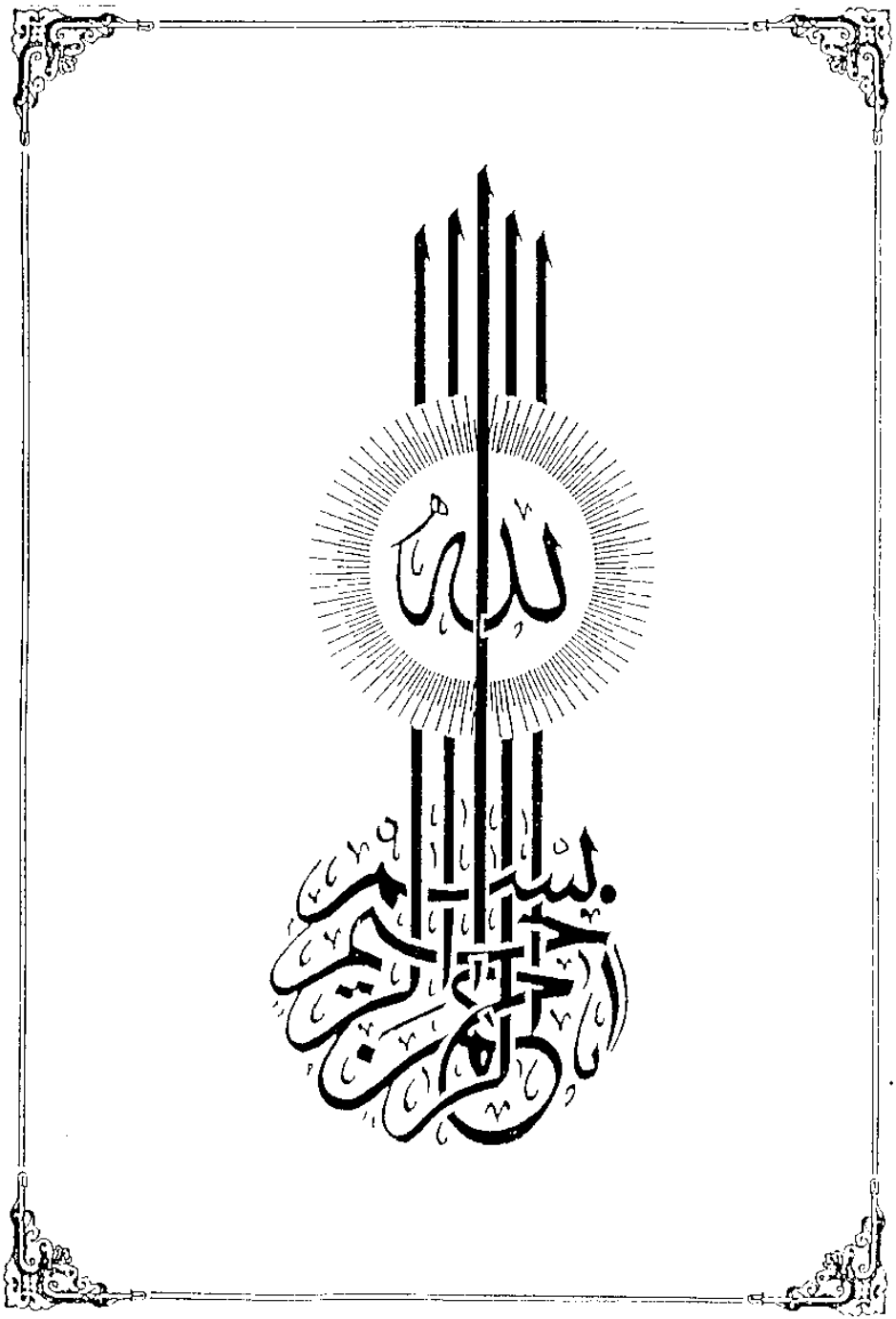
FIRST & FOREMOST THANKS TO GOD

Acknowledgment

I would like to express my deepest appreciation and gratitude to **Prof. Dr.** ***Ibrahim Shamekh Mohamed*** professor of general surgery and breast surgery, faculty of medicine, Ain Shams university for his continous support, constructive criticism, and continuous encouragement through out the work.

I would like also to express my deep gratitude and thanks to **Dr.** ***Samy Ahmed Abd El-Rahman*** lecturer of general surgery, faculty of medicine, Ain Shams university for his sincere supervision, encouragement, and energetic help in the details of this work.

Also, I am very grateful to all members who help me in details of this work.



List of Contents

List of tables

INTRODUCTION

قـال اللـه تعـالى :

بسم الله الرحمن الرحيم

﴿ وأوحى ربك إلى النحل أن اتخذي من الجبال بيوتاً ومن الشجر ومما يعرشون ﴿٦٨﴾ ثم كلي من كل الثمرات فاسلكي سبل ربك ذللا يخرج من بطونها شراب مختلف ألوانه فيه شفاء للناس. إن في ذلك لآية لقوم يتفكرون ﴿٦٩﴾ ﴾ صدق الله العظيم

سورة النحل

All these Ayats described from 14 centuries and indicates that honey is a good food as well as a curative agents to different diseases. These ayats also gave attention to all scientists to discover all secrets in the honey. (***Holy Koran***) The use of honey as wound dressing is well established in ancient and traditional medicine. (***Zumal & Lulat, 1989***) Its use as a topical antibacterial agent for the treatment of wounds, burns and ulcers has been rediscovered in recent times. (***Micinerney, 1990***) Use of honey for its reputed wound healing and antiseptic properties has been reviewed by stomfay. (***1960***)

The antibacterial activity is attributed to the high osmolarity resulting from the honey applied to the lesion, this effect by high sugar concentration is called osmotic effect. (***Chirife & Herszage, 1983***) Another type of antibacterial property of honey is that due to the presence of inihibin. The effect of inhibin is due to the accumulation of hydrogen peroxide in diluted honey. This material well known for its antiseptic properties, is by-product of the formation of gluconic acid in diluted honey by enzyme called glucose-oxidase. (***Duisberg, 1962***)

Muller (***1938***) stated that honey a cleansing and healing effect on wounds by stimulating the lymph formation and flow, he said that vitamins A,C and riboflavin have a healing effect on wounds. Also Michael (***1982***) discovered that the honey contains dextrose and leavulose and in addition contains variable but significant amount of minerals including iron, and vitamins,

particularly A, B and C. All these substances are essential to rapidly growing tissue and if absorbed locally could in part account for rapid formation of healthy granulation tissue which is seen to occur.

Ulcer is a discontinuity of an epithelial surface there is usually progressive destruction of surface tissue. Ulcers are classified as non-specific, specific (*e.g.* tuberculous or syphilitic, ... etc.) or malignant. (***Charles, 1996***)

Cutaneous ulcers are often associated with infection and usually imply a chronic problem. (***Puckett & Silver, 1992***)

AIM OF THE WORK

The aim of this work is to study the healing effect of honey versus fucidin as local treatment of different skin ulcers such a venous ulcers, pressure ulcers, diabetic ulcers, burn ulcers, ... etc.

REVIEW OF LITERATURE

Anatomy of the Skin

The Skin envelops the entire surface of the body, and its epithelium is continuous with that of the digestive, respiratory and urogenital systems. It is an indispensable organ in as much as its total destruction is incompatible with survival. Skin serves as a barrier against the environment and is also the principle site of communication with the environment. Cells die as the epidermis is replaced, and keratin and sebum represent accumulations of the necrotic cells.

The skin also contains many sensory nerve endings. (***Montagna, 1962***)

The skin is a highly specialized bilaminate structure that rests on subcutaneous layer of padding. It is formed of an outer layer of epidermis and inner layer of dermis. The thickness of each layer varies in different areas of the body.

The skin varies in thickness from 0. 5 mm to 6mm with an average of 1. 2 mm. (***Robson et al ., 1979***)

The Epidermis

The highly cellular epidermis is 0.06 mm to 0.8 mm. It communicates with the dermis by multiple irregular interpapillary ridges and grooves. (***Robson et al., 1979***)

It is formed from many layers :

1. Stratum corneum (outermost layer).
2. Stratum spinosum.
3. Stratum granulosum.
4. Stratum germinativum (innermost layer).

N.B: Stratum lucidum (outer layer which is apparent in thick skin). It lies under stratum corneum.

1. *Stratum corneum* :

The stratum corneum is the outermost layer of the epidermis. In most areas of the body it is 10 to 20 um thickness (except on the palms and soles where it is thicker).

It is composed of non-viable dry keratinized cells. This layer is responsible for protection against invasion by microorganisms. (***Briggamam, 1983***)

2. *Stratum spinosum* :

It constitutes the main bulk of the viable cells. It synthesizes keratin and precursor proteins for the cells in the stratum granulosum. (***Briggaman, 1983***)

3. *Stratum granulosum* :

It synthesizes proteins related to the fully keratinized cells. (***Briggaman, 1983***)

4. ***Stratum germinativum*** :

It contains melanocytes, as well as cells for keratin production, which are keratinocytes.

These cells are the only proliferating cells within the epidermis. Melanocytes secrete organelles called melonosomes. Once formed melonosomes. Are transferred to the tips of the dendrites of melonocytes then incorporate into the adjacent keratinocytes and remain there as a granules. Keratinocytes and melonocytes are present in a ratio of 4: 1. (***Briggaman, 1983***)

Stratum lucidum:

Stratum lucidum is more apparent in thick skin. It is translucent and is composed of thin layer of extremely flattened cells.

The Dermis:

The dermis is 20 to 30 times thicker than the epidermis. It contains the nervous, vascular, lymphatic, and supporting structures for the epidermis and harbors the epidermal appendage. (***Silbert, 1983***)

Layers of the dermis are:

1. ***The papillary dermis*** : *Is slightly thicker than the overlying epidermis. It is separated form the underlying reticular. Dermis by horizontal plexus of vessels that provides the overlying papillary dermis by its rich blood supplies.*

2. *The reticular dermis* : *Most of the dermis is formed of reticular layer. It is formed form reticular fibers and collagen Fibers type I, which account for 80% of the fibers in the reticular layer. These fibers form a dense network of the reticular layer which contains the blood vessels, lymphatics and nerves supplying the skin.* ***(Silbert, 1983)***

The dermis contains fibrous and nonfibrous matrix molecules.

1. **The Fibrous elements** : Are composed mainly of collagen fibrils and elastic fibers. The collagen is primarily type I and III in a ratio of about 85% to 15% Type IV Collagen is the major component of the basal lamina zone.

The elastic fibers comprise two components, aligned bundles of microfibrils and a dense elastin matrix. The microfibrils are believed to serve as a template for the elastin matrix. These fibrous elements form the bulk, density and tensile properties of the skin and allow for its compliance and elasticity. The fibrous glycoproteins in the dermis are essential for cell matrix attachment. (***Silbert , 1983***)

2 . **The non-fibrous elements** : Are composed of glucosamin glycans (GAGs) and glycoproteins of the amorphous ground substance. GAGs are synthesized by fibroblasts and transformed into phagocytic vacuoles by macrophages. The non-fibrous matrix molecules form the ground substance that influences the osmotic properties of the skin. It also serves as an integrative continuos medium for all other structural elements. (***Silbert, 1983***)