

## ANTI-BACTERIAL WOUND HEALING ACTIVITY (INDEMAL-E-ZAKHM) BY HONEY (ASAL) ON NON-HEALING TRAUMATIC ULCER ON OPD PATIENTS - A CLINICAL TRIAL

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### ABSTRACT

Wound healing is a complex process with many interdependent patho-physiological and immunological mediators to restore the cellular integrity of damaged tissue. Cutaneous wound healing is the repair response to a multitude of pathologies induced by trauma, surgery, and burn leading to the restoration and functionality of the compromised cells. Many different methods have been employed to treat acute and chronic wounds, such as antimicrobial therapy, as most wounds are susceptible to infection from microbes and are difficult to treat. However, many antimicrobial agents have become ineffective in wound treatment due to the emergence of multiple drug-resistant bacteria, and failures in current wound treatment methods have been widely reported. For this reason, alternative therapies have been sought, one of which is the use of honey as a wound treatment agent. Honey is a safe natural substance, effective in the inhibition of bacterial growth and the treatment of a broad range of wound types, including burns, scratches, abscesses, malignancies, leprosy, fistulas, leg ulcers, boils, cervical and varicose ulcers, amputation, burst abdominal wounds, septic and surgical wounds, cracked nipples, and wounds in the abdominal wall. Honey comprises a wide variety of active compounds, including flavonoids, phenolic acid, organic acids, enzymes, and vitamins, that may act to improve the wound healing process.

**KEYWORDS:** Wound healing, Honey, antibacterial effects, anti-fungal properties.

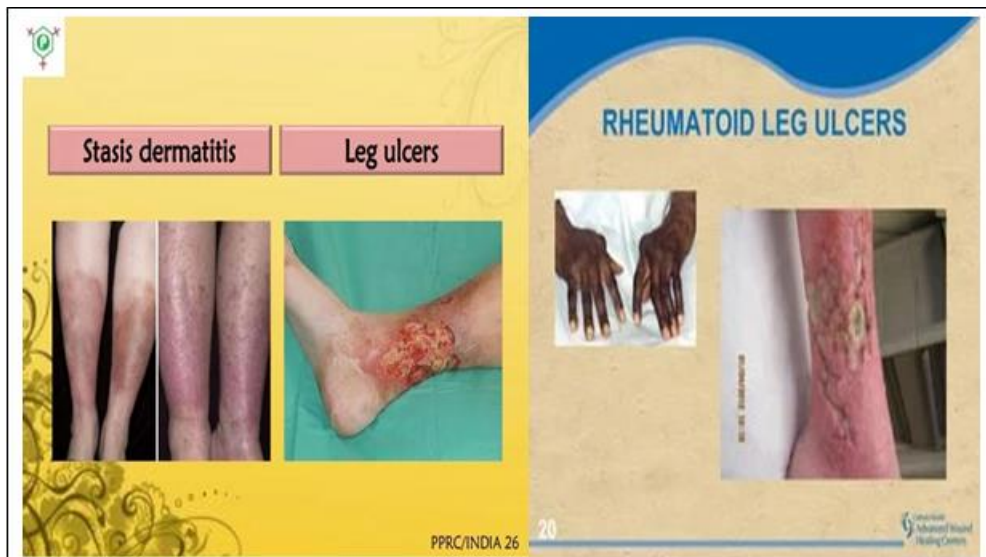
### I. INTRODUCTION OF WOUND (ZAKHM)

A wound is a disturbance in the normal structure and function of the epidermis. The epidermis is considered the first line of defense and protection against trauma. Various mechanisms can cause wounds, such as acute injury (abrasion, puncture, and/or crushing), surgery, and physiological conditions that compromise the skin (e.g., ischemia and pressure). Wound healing is a complex process with many interdependent immunological and patho-physiological mediators to restore the cellular integrity of the damaged tissue.

Feature	Ulcer Type			
	Venous	Arterial	Neuropathic Diabetic	Pressure
Underlying condition	Varicose veins, previous deep-vein thrombosis, obesity, pregnancy, recurrent phlebitis	Diabetes, hypertension, smoking, previous vascular disease	Diabetes, trauma, prolonged pressure	Limited mobility
Ulcer location	Area between the lower calf and the medial malleolus	Pressure points, toes and feet, lateral malleolus and tibial areas	Plantar aspect of foot, tip of the toe, lateral to fifth metatarsal	Bony prominences, heel
Ulcer characteristic	Shallow and flat margins, moderate-to-heavy exudate, slough at base with granulation tissue	Punched out and deep, irregular shape, unheal-thy wound bed, presence of necrotic tissue, minimal exudate unless infected	Deep, surrounded by cal-lus, insensate	Deep, often macerated
Condition of leg or foot	Hemosiderin staining, thickening and fibrosis, eczematous and itchy skin, limb edema, normal capillary refill	Thin shiny skin, reduced hair growth, cool skin, pallor on leg elevation, absent or weak pulses, delayed capillary refill, gangrene	Dry, cracked, insensate, calluses	Atrophic skin, loss of muscle mass
Treatment	Compression therapy, leg elevation, surgical management	Revascularization, anti-platelet medications, management of risk factors	Off-loading of pressure, topical growth factors	Off-loading of pressure; reduction of excessive moisture, shear, and friction; adequate nutrition

Wound healing depends on the presence of multiple types of cells, the extracellular matrix (ECM), cytokines, and growth factors, in addition to restoring the functionality of the compromised cells. Four distinct and overlapping stages are involved – inflammation, proliferation/regeneration, and tissue fibroplasia. Recently, there has been a major increase in the burden of wound healing management due to the presence of multiple drug-resistant bacteria that can interfere with the wound repair process. Therefore, alternative natural

compounds have been sought. Among those compounds is honey. The therapeutic potential of honey in the treatment of wounds and ulcers was initially recognized by the Sumerians and was known as far back as 2100–2000 BC. The beneficial properties of honey have been known since ancient times, and its therapeutic use remained popular until the advent of antibiotics. Published data show that honey benefits wound healing in the chronic inflammatory phase via the scavenging of reactive oxygen species produced by neutrophils.



Honey is made from the nectar of flowers collected by honeybees and is composed mostly of glucose and fructose. However, it also contains vitamins, minerals, amino acids, enzymes, organic acids, and other compounds. Its composition is affected by seasonal

variations as well as the geographic location where the nectar was gathered by the bees. The moisture content of the deposited nectar mixture reduces and dries out, becoming more concentrated and producing viscous honey.

Natural honey is composed of around 82% of water, carbohydrates, proteins, phytochemicals, antioxidants, and minerals. It has been proven that few of the ingredients that determine the biological and medical potential of this substance are likely to vary among the various types of honey. The sugars in honey include, in descending order, the following: “fructose (38.2%), glucose (31.2%), di-saccharides and some other tri-

saccharides and higher saccharides (9%) and sucrose (0.7–1%)”. Honey containing a wide range of active compounds, including flavonoids, organic acids, phenolic acid, vitamins, and enzymes, may improve wound healing. The deposition of fibroblasts and collagen formation may also be promoted by the large amount of amino acids found in honey.



The natural properties of honey as well as its active compounds are crucial for the wound healing process. Natural honey is a viscous fluid; its jelly consistency creates a surface layer over the wound that inhibits the entrance of bacteria and protects the wound from dehydration.<sup>[2]</sup> Its high sugar content creates a higher osmotic gradient that pulls fluid up through the subdermal tissue and offers an additional glucose source for flourishing cellular components in the wounded area. The water activity of honey is less than 0.91 aw, which prevents and controls the growth of bacteria on the wound surface and causes fluid flow that flushes slough, debris, and necrotic tissue as well as microorganisms out of the wound. Apart from this, the low water activity of honey helps transport oxygen and nutrients from the deep tissue into the wound area. In addition, the low pH of honey increases tissue oxygenation, while free radicals, which lead to tissue damage, are removed by flavonoids and aromatic acids.

Another property that triggers antimicrobial activity in honey is the production of hydrogen peroxide on the glucose. Certain types of honey do not rely on hydrogen peroxide for their antimicrobial activity but probably rely more on pH change and osmolarity for their bactericidal capability. The unique Manuka factor (UMF) in Manuka honey (MH) is the methylglyoxal (MGO) level which is responsible for its antibacterial effect. However, hydrogen peroxide-dependent honey stimulates the production of vascular endothelial growth factor (VEGF) and sterilizes the wound site. In addition to glucose oxidase, the invertase produced by bees strengthens the

osmotic potential of honey, dividing sucrose into fructose and glucose.

Two principal types of honey that have been researched are non-peroxidase MH and peroxidase based honey, both known for their efficacy in wound management. Hence, the aim of this review is to summarize recent studies on the wound healing properties of honey.

## II. Antimicrobial activities of Honey

According to the international guidelines on the proper use of antimicrobials in medicine, honey and other alternative therapeutics were used for the treatment of skin lesions in both humans and animals. The antibacterial effect of honey has been reported in numerous studies. Honey exerts bacteriostatic and bactericidal actions. Many enzymes are present in an internal pouch of the bee called the crop and are transferred to the honey.

The antibacterial activity of non-peroxide honey is related to the presence of glyoxal, 3-deoxyglucosulose, and MGO. The concentration of MGO in honey is dependent on the geographic location and the kind of honey. However, it is well-known that MH has the highest concentrations of MGO compared to other types of honey. MGO is present in all kinds of honey, with levels ranging from 3 to 800 µg/gram, depending on the type of MH. The antibacterial efficacy of honey is dependent on the MGO content; honey will have a weaker or stronger effect on a narrower or wider spectrum of bacteria, particularly on the methicillin-

resistant *Staphylococcus aureus* strains, vancomycin-resistant enterococci, and *Pseudomonas aeruginosa*. Nevertheless, studies have shown that a high MGO concentration is not required to exert antibacterial efficacy. For instance, in a study by Girma et al. (2019), MH of lower UMF grade demonstrated significantly increased antimicrobial activity compared to higher UMF grade honey against tested *S. aureus* and *E. coli*. An MGO of 10+ UMF values were sufficient to provide antibacterial efficacy. It has been reported that high MGO may cause damage at the cellular level either through blood leading to its glycation or via other external pathways leading to malignant young cell degeneration.

The antimicrobial effects of honey have also been studied in various in vivo experiments, suggesting that this property of honey is crucial in reducing secondary bacterial contamination of the wound area and hastening the healing process.

Fluids in the wound are drawn out of the damaged tissues, leading to drying of cellular tissues and bacterial death. In addition, phenolic compounds, organic acids, vitamins, and flavonoids exert antioxidant action and boost the antibacterial effect of honey. Flavonoids neutralize free radicals produced by hydrogen peroxide. However, despite the increase in studies on the use of honey for wound healing, whether traumatic or surgical in origin, only a few studies on its use on infected wounds have been published. Some authors analyzed honey's potential on the growth of selected intestinal bacteria and in combatting pathogenic bacteria frequently isolated from skin wounds of mammals, including humans. In a rat model, the topical application of honey on a dorsal wound resulted in an increase in both salt- and acid-soluble collagens by 107 and 117%, respectively. Further, it potentiated the levels of insoluble collagen to achieve a 109% increase after seven days of treatment compared to the untreated control.

Medical-grade honey (MGH) is seen as promising wound therapy because it has a wide spectrum of antimicrobial efficacy with no known resistant strains. It has been effective against clinical isolates of *Pseudomonas aeruginosa* and their associated biofilm formation.

Studies have shown that the supplements in the MGH formulation such as vitamins (C and E) enhanced the antimicrobial activity of pure honey. Supplementation of honey with other additives may, therefore, be a promising approach to further improve the antimicrobial activity of honey.

Another study evaluated the antibacterial efficacy of 57 Slovak blossom honeys against *Pseudomonas aeruginosa* and *Staphylococcus aureus*. Their data showed that different types of honey had different

antibacterial potentials. Between acacia, wildflower and rapeseed honeys, the wildflower honey samples showed the greatest antibacterial activity, while rapeseed honeys had the highest level of minimal inhibitory concentration. There was a statistically significant association between the antibacterial activity of the honeys and their H<sub>2</sub>O<sub>2</sub> and turgor pressure content. However, there was no correlation between glucose oxidase (GOX) and H<sub>2</sub>O<sub>2</sub> content.

### III. Unani Concept of An Ulcer (Qarha)

Ibn-e-sena apni kitab Alqaanoon main "Bayan aam qurooh ka" main likhte hain.

"Qarha jise hindi main karha khwah zakhme gehra kehte hain uski paidaish zakhm se hoti hai aur phodon ke phootne se khwah busoor aur phunsiyan ke phootne se isliye ke tafarruqitesal gosht ka jab der tak thehre khwah ziyada badh jaaye aur usmein qeeh paida ho uswaqt uska naam qarha rakhte hain. 22

Ibne Sena in his book Qa'anon, the chapter of qarha (ulcer) states that karha, a hindi word or deep wound is formed by wound or bursting of abscess or boil because when there is breach in continuity (tafarruqitesal) of flesh for long duration or more in size, suppuration occurs in it known as Qarha 22.

#### Characteristics of Pus 22

- Sadeed: when pus is liquid in nature.
- Wasakh: when pus is semi solid in nature
- Khasir: when pus is soft & dry & the color of pus may vary from whitish, blackish to reddish

### IV. Classification of An Ulcer

Types Of Qarha:

#### A. According to depth.22

- Qurooh-e-Zahir (Superficial): which is not deeper in skin
- Qurooh-e-Ghair (deeper): When deep cavity is formed.
- Nasoor: if surrounding flesh is hard & qarha is with narrow opening & more depth.
- kahaf or Mujni: if surrounding flesh is not hard.

#### B. According to pain 22

- Molim (Painful): the qarha with pain
- Ghair molim (painless): The qarha without pain

#### C. According to inflammation.22

- Multahib (Inflamed): The qarha with inflammation
- Ghair Multahib (Non-inflamed): The qarha without inflammation.

#### D. According to slough22

- Naqui: Qarha with slough
- Ghair Naqui: Qarha without slough (filled with humor or fluid)



**E. According to taadiya (infection)<sup>22</sup>**

- Mutaffin: Only pus is present in qarha without any degeneration.
- Ghair mutaaffin: If body color also changes along with Qurooh-e-Radiyyah e.g. white lead color, yellow, it indicates suoe mizaj (improper temperament) of liver & blood which comes towards the ulcer (qarha) therefore these infected (mutaaffin) ulcer heals with difficulty.

**F. According to visibility <sup>22</sup>**

- Kharqiya. (revealed): Indurations & hardness is visible.
- Chore (concealed): Qarha is internally more in size & externally looks small.

**G. According to cause<sup>23</sup>**

- Baseet (simple) Ulcer with prolonged duration.
- Murakkab (Compound)

With cause: Exudates or discharge comes towards the ulcer & its sign is excessive fluid (exudation) in it.

With disease: It can occur in different ways:

- Sometimes due to suoe mizaj haar (hot temperament)  
Sometimes due to suoe mizaj barid (Cold temperament)
- Sometimes due to suoe mizaj yabis (dry temperament)
- Sometimes due to suoe mizaj ratab (wet temperament)

Aali in which more or less amount of flesh grow.

With arz: severe pain

**V. Modern Concept of An Ulcer**

An Ulcer is a break in the continuity of an epithelial surface. It is characterized by progressive destruction of the surface epithelium and granulating base. The latter may be seen as clean, healthy granular tissue or necrotic slough that may obscure deep extensions and tracts. Ulcers are classified as non-specific, specific & Malignant. Non-specific ulcers are due to infection of wounds or physical or chemical agents. Local irritation, interference with circulation and sensation are predisposing factors. 3, 24

Deeper denuded area of skin 17,18,19,20,21, (Full epidermal & dermal loss).

An Ulcer is a lesion in which there has been destruction of the epidermis and the upper papillary layer of the dermis. Certain features that are helpful in determining the cause of ulcers include locations, borders, base, discharge & associated topographic features of the lesions, such as nodules, excoriations, varicosities, hair distribution presence / absence of sweating, and adjacent pulses. 25,26,27,28,29,30,31.

**VI. Classification Of Ulcers**

Two types of classification of ulcers are possible:

- Clinical<sup>20,21</sup>
- Pathological <sup>20,21</sup>

Clinically, an ulcer may be either

Spreading or non-healing ulcer:- when the surrounding skin of the ulcer is inflamed, edge is also inflamed & edematous and the floor is covered with slough without any evidence of granulation tissue.

Healing:- when there is granulation tissue in the floor of the ulcer, the surrounding skin is not inflamed and the edge shows bluish outline of growing epithelium, moreover, there is slight serous discharge.

Callous: - when there is pale granulation tissue in the floor, there are considerable indurations at the base, edge and surrounding skin. This ulcer shows no tendency towards healing. The ulcers are classified into three main headings.

- Non-specific Ulcers
- Specific Ulcers
- Malignant Ulcers

A. Non-Specific Ulcer: -

There are various causes of such ulcers.

According to the cause these ulcers are classified as below –

- Traumatic ulcer –
- Neurogenic ulcer.
- Infective ulcer -.
- Tropical ulcer
- Cryopathic ulcer
- Martorell's ulcer
- Bazin's ulcer
- Diabetic ulcer.
- Miscellaneous ulcers

B. Specific ulcers: -

These are seen in tuberculosis, syphilis, soft sore and actinomycosis Meleney's ulcer is included in this groups.

C. Malignant ulcers: -

Epithelioma, rodent ulcer and malignant melanoma are said to be malignant ulcers.

**VII. Material and method**

Place of the study: Department of Jarahiyat of Dr. M.I.J.Tibbia Unani Medical College & Haji Abdul Razzaque Kalsekar Hospital Mumbai.

No. of patients: 45

**Inclusion criteria**

This study was carried out on 45 patients in age between age group 20 – 80 years. The patients of traumatic ulcers, the types of non-healing, spreading ulcer were included in this study. The ulcer was said to be spreading when the surrounding skin of the ulcer was inflamed, edge was

also inflamed & edematous and the floor was covered with slough without any evidence of granulation tissue.

According to the cause of the trauma, the ulcer may be situated anywhere in the body. But these ulcers occur more commonly where the skin is closely applied to bony prominences.

e.g. shin, malleoli and back of the heel.

#### Exclusion criteria

Following patients were excluded in this study. The patients receiving concurrent drug therapy Having h/o systematic diseases e.g., IHD, TB, and HT etc. Having any other types of ulcer.

- Mentally retarded patients
- Prisoners
- Drug addict

Subjective parameters are as follows:-

- History of patient
- Physical examination
- Examination of Arteries, Veins, Nerves, Lymph Nodes, Discharge.
- Pain.

Objective parameters (Local Examination)

- Length x Width
- Size
- Shape
- Edge
- Floor
- Base etc

Observations were carried out under following heading.

- Age
- Sex
- Religion
- Duration of ulcer
- Extremity involve
- Marital status
- Education
- Shape of ulcer

Pre-dressing Assessment

A proforma was prepared & all patients were managed on the same pattern (proforma attached,) thorough general check-up had been done with relevant investigation in all cases.

Inspection:- All the ulcers were inspected by following means.

- Size
- Shape
- Position
- No
- Edge
- Surrounding area
- Floor
- Discharge

Palpation: - All the ulcers were palpated by following means.

- Edges
- Margins
- Base
- Depth
- Bleeding
- Relation with deeper structures
- Surrounding skin & tenderness etc.

Mode of application of honey

Material used

- Savlon
- Hydrogen per oxide
- Spirit
- Sponge holder
- Adhesive tape
- Honey
- Bandage
- Sterile gauze
- Scissor

The procedure included cleaning of the ulcers first, even though many describe honey has cleansing and debriding action on ulcers. Necrotic tissue was removed before dressing ulcers with honey.

In this study

The floor of ulcer was cleaned & debridement was carried out by sterile gauze & scissor.

The gauze was dipped in savlon & ulcer & the surrounding area was cleaned. Then hydrogen per oxide was used to clean the surrounding area. Then the ulcer & surrounding area was cleaned by spirit. A thick layer of honey was applied on sterile gauze. Then it was dressed to the ulcer.

The dressing was changed daily in same manner. The ulcers were considered to be free of sepsis if following was present,

- Clear healthy granulation tissue
- No or minimal discharge
- No fever
- No tachycardia

Heating of honey was avoided because the glucose oxidase enzyme in honey that produces hydrogen peroxide, a major component of the antibacterial activity of honey, is very readily inactivated by heat. In all cases honey was topically applied in natural form without boiling or autoclaving because while boiling one poison is created in the honey known as HMF. Hydroxymethylfurfural (5-hydroxymethyl-2-furaldehyde), also called HMF, is a compound that results from the breakdown of simple sugars (such as glucose or fructose) at pH 5 or lower. HMF occurs naturally in honey, especially in warm climates. This is a very danger chemical for human body. FICHISTOST TEST can find the content of this poison.

**Statistics**

The data so obtained were subjected to computerized statistical analysis to find mean values, standard deviation, percentage & “t” values. The present study was conducted on 45 patients of chronic non-healing traumatic ulcer at Department of Jarahiyat of Dr. M.L.J.Tibbia Unani Medical College & H.A.R.K Hospital, Mumbai. The aim of this study is to evaluate the efficacy of honey in case of chronic non-healing traumatic ulcer when applied topically. The observations were made under the following heading:

- Age
- Sex
- Religious
- Marital status
- Education
- Duration of Ulcer
- Position of Ulcer
- Shape of Ulcer

Edema of Margin of Ulcer before and after treatment.

Tenderness of Margin of Ulcer before and after treatment  
Edema of the Edge before and after treatment.

Discharge on the floor of Ulcer before and after treatment.

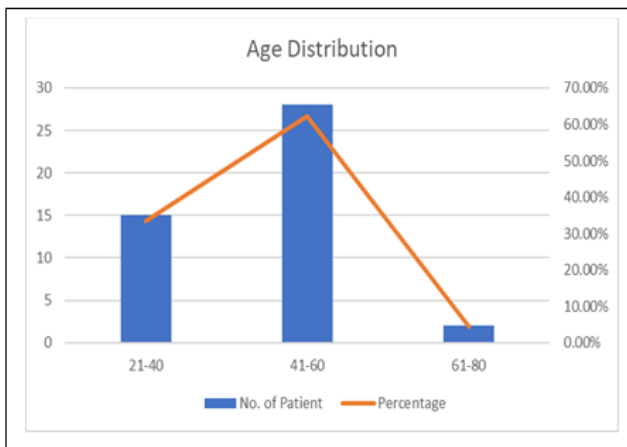
Induration of the base before and after treatment.

Edema of the surrounding area before and after treatment.

**OBSERVATION AND RESULT**

The present study was conducted on 45 patients of chronic non-healing traumatic ulcer at Department of Jarahiyat of Dr M.L.J.Tibbia Unani Medical College & H.A.R.K Hospital Mumbai. The aim of this study is to evaluate the efficacy of honey in case of chronic non-healing traumatic ulcer when applied topically. The observations were made under the following heading

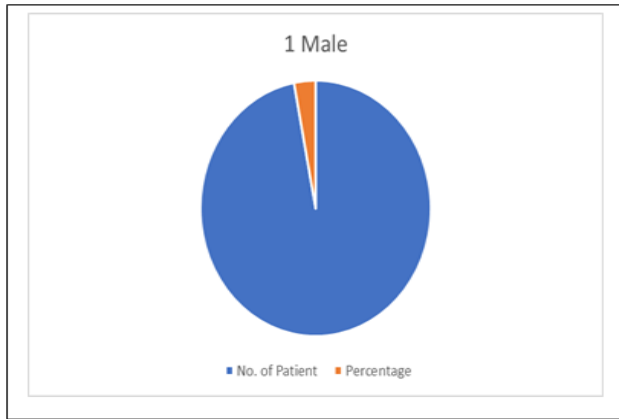
1. Age
2. Sex
3. Religion
4. Marital Status
5. Education
6. Duration of Ulcer
7. Position of Ulcer
8. Shape of Ulcer
9. Edema of Margin of Ulcer before and after treatment
10. Tenderness of Margin of Ulcer before and after treatment
11. Edema of the Edge before and after treatment
12. Discharge on the floor of Ulcer before and after treatment
13. Induration of the base before and after treatment
14. Edema of the surrounding area before and after treatments.



Graph No 1 Age Distribution.

Sr. No.	Age Group	No. of Patient	Percentage
1	21-40	15	33.33 %
2	41-60	28	62.22%
3	61-80	02	4.44%

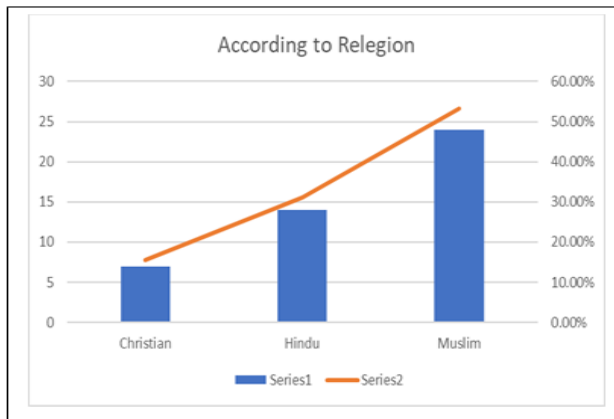
Table 1: Age Distribution



Graph No. 02 Sex Distribution.

Sr. No.	Sex	No. of Patient	Percentage
1	Male	27	84.0 %
2	Female	8	16.0 %

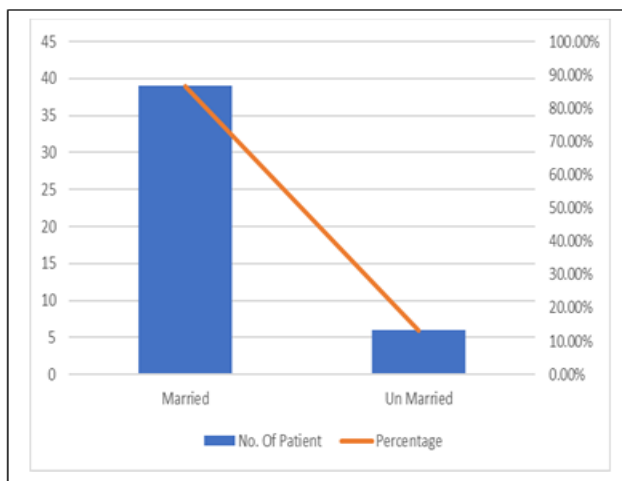
Table No. 02 Sex Distribution.



Graph No. 03 According to Releigion

Sr. No.	Releigion	No. Of Patient	Percent age
1	Christia n	07	15.55 %
2	Hindu	14	31.11%
3	Muslim	24	53.33%

Table No 03 According to Releigion

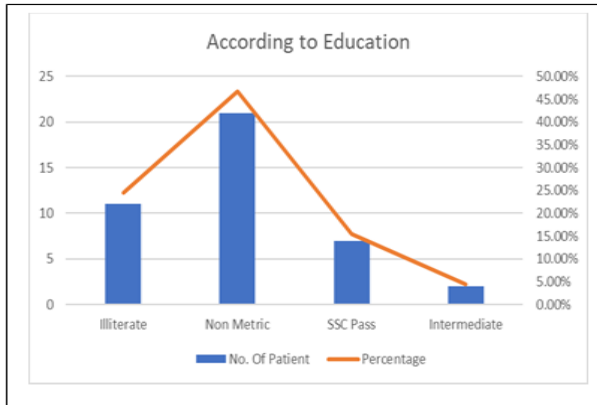


Graph 04 Martial Status

Sr. No.	Martial Status	No. Of Patient	Percentage
1	Married	39	86.66 %
2	Un Married	06	13.33%

Table 04 Martial Distribution.

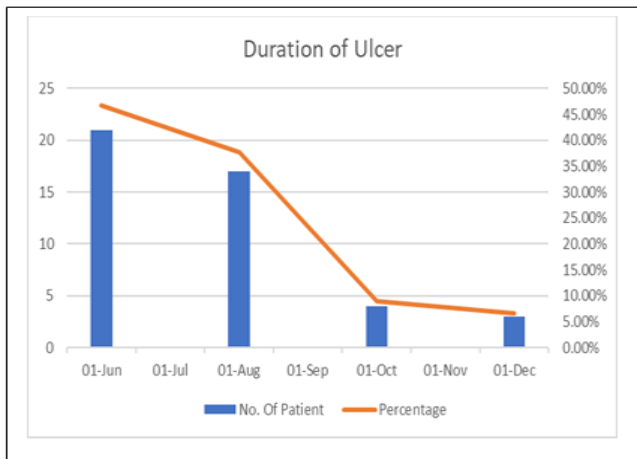




Graph 05 Education Distribution.

Sr. No.	Education Status	No. Of Patient	Percentage
1	Illiterate	11	24.44 %
2	Non Metric	21	46.66%
3	SSC Pass	07	15.55 %
4	Intermediate	02	4.44%
5	Graduate	04	8.88%

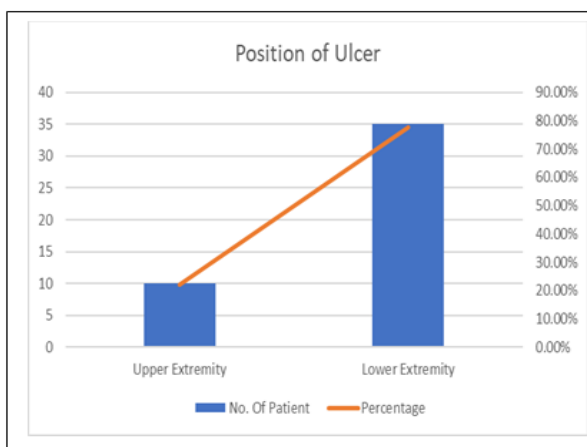
Table 05 Education Distribution



Graph 06 Duration of Ulcer.

N o.	Duration of Ulcer in week	No. Of Patient	Percentage
1	4-6	21	46.66 %
2	6-8	17	37.77 %
3	8-10	04	8.88 %
4	10-12	03	6.66 %

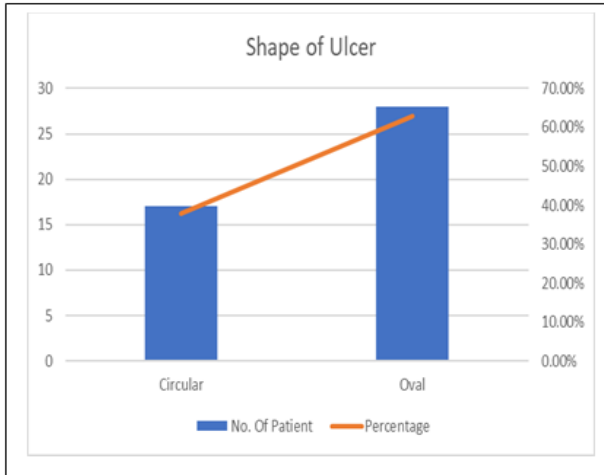
Table 06 Duration of Ulcer



Graph No 7 Position of Ulcer

Sr. No.	Position of Ulcer	No. Of Patient	Percentage
1	Upper Extremity	10	22.22 %
2	Lower Extremity	35	77.77 %

Table No. 07 Position of Ulcer



Graph No. 08 Shape of Ulcer

Sr. No.	Shape of Ulcer	No. Of Patient	Percentage
1	Circular	17	37.77 %
2	Oval	28	62.77 %

Table No. 08 Shape of Ulcer

Table 09

Sr. No.	Oedema of Margin													
	Before Treatment	After Treatment						Before Treatment	After Treatment					
		Ist	IInd	IIIRD	IVth	Vth			Ist	IInd	IIIRD	IVth	Vth	
1	2	1	0	0	0	0	24	2	1	0	0	0	0	0
2	2	2	2	1	0	0	25	1	0	0	0	0	0	0
3	2	2	1	0	0	0	26	2	1	0	0	0	0	0
4	2	2	1	0	0	0	27	2	1	0	0	0	0	0
5	2	2	1	1	0	0	28	1	0	0	0	0	0	0
6	2	2	1	0	0	0	29	1	1	0	0	0	0	0
7	1	1	0	0	0	0	3	2	1	1	0	0	0	0
8	1	1	1	0	0	0	31	2	2	1	0	0	0	0
9	2	2	1	0	0	0	32	2	1	0	0	0	0	0
10	1	1	1	0	0	0	33	1	1	0	0	0	0	0
11	2	2	1	0	0	0	34	2	1	0	0	0	0	0
12	2	2	1	0	0	0	35	2	1	1	0	0	0	0
13	1	1	0	0	0	0	36	1	1	1	0	0	0	0
14	2	2	1	0	0	0	37	2	2	2	1	1	0	0
15	2	2	2	2	1	1	38	2	1	0	0	0	0	0
16	2	2	2	2	1	1	39	2	1	1	0	0	0	0
17	2	2	1	1	0	0	40	1	1	0	0	0	0	0
18	2	2	1	1	0	0	41	1	1	0	0	0	0	0
19	1	0	0	0	0	0	42	1	1	0	0	0	0	0
20	2	1	0	0	0	0	43	1	1	0	0	0	0	0
21	1	1	1	0	0	0	44	1	0	0	0	0	0	0
22	2	2	1	1	0	0	45	1	0	0	0	0	0	0
23	2	1	0	0	0	0	Total		80	57	11	3	2	

GRAPH NO. 10

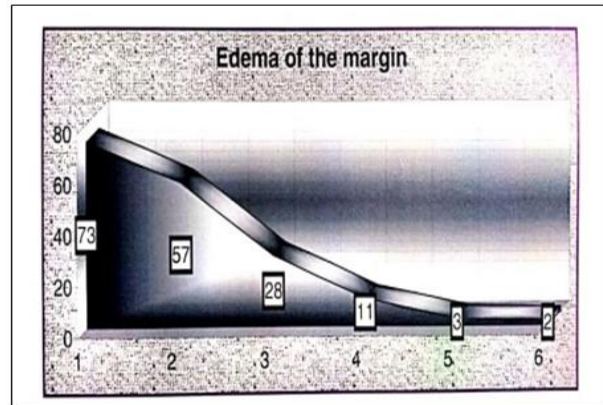
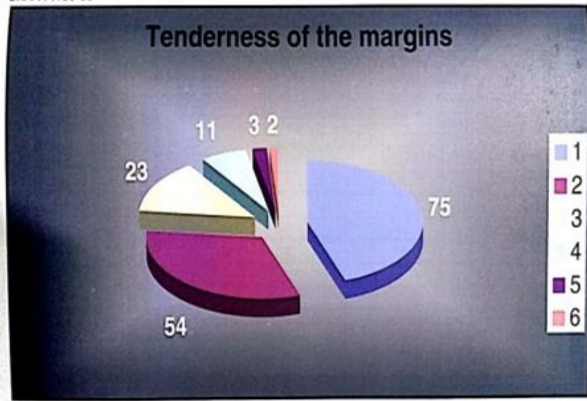


Table 10

Sr. No.	Tenderness of Margin													
	Before Treatment	After Treatment					Sr. No.	Before Treatment	After Treatment					
		I st	II nd	III rd	IV th	V th			I st	II nd	III rd	IV th	V th	
1	1	1	0	0	0	0	25	1	0	0	0	0	0	
2	2	2	1	1	0	0	26	2	1	0	0	0	0	
3	2	2	1	0	0	0	27	2	1	0	0	0	0	
4	2	2	1	1	0	0	28	1	0	0	0	0	0	
5	2	2	1	1	0	0	29	1	1	1	0	0	0	
6	2	2	1	1	0	0	30	2	2	1	0	0	0	
7	1	1	0	0	0	0	31	2	1	0	0	0	0	
8	1	1	1	0	0	0	32	2	1	0	0	0	0	
9	2	2	1	1	0	0	33	1	1	0	0	0	0	
10	2	2	1	0	0	0	34	2	1	0	0	0	0	
11	2	1	1	0	0	0	35	2	1	1	0	0	0	
12	2	1	0	0	0	0	36	1	1	1	0	0	0	
13	2	2	1	1	0	0	37	2	2	2	1	1	0	
14	2	1	0	0	0	0	38	2	1	0	0	0	0	
15	2	2	1	1	1	1	39	2	1	1	1	0	0	
16	2	2	2	2	1	1	40	1	1	0	0	0	0	
17	2	1	0	0	0	0	41	1	1	0	0	0	0	
18	2	1	1	0	0	0	42	1	1	0	0	0	0	
19	2	1	0	0	0	0	43	1	0	0	0	0	0	
20	2	1	0	0	0	0	44	1	0	0	0	0	0	
21	2	2	1	0	0	0	45	1	1	0	0	0	0	
22	1	1	0	0	0	0	Total	75	54	23	11	3	2	
23	2	1	0	0	0	0								
24	2	1	0	0	0	0								

Table 11

Sr. No.	Edema of the edge													
	Before Treatment	After Treatment					Sr. No.	Before Treatment	After Treatment					
		I st	II nd	III rd	IV th	V th			I st	II nd	III rd	IV th	V th	
1	1	1	0	0	0	0	25	1	0	0	0	0	0	0
2	2	1	0	0	0	0	26	2	1	0	0	0	0	0
3	2	1	0	0	0	0	27	1	0	0	0	0	0	0
4	2	1	1	0	0	0	28	1	0	0	0	0	0	0
5	2	2	1	0	0	0	29	1	0	0	0	0	0	0
6	2	2	1	0	0	0	30	2	1	0	0	0	0	0
7	1	1	0	0	0	0	31	1	1	1	0	0	0	0
8	1	1	0	0	0	0	32	1	0	0	0	0	0	0

9	2	2	0	0	0	0	33	1	1	0	0	0	0
10	2	1	0	0	0	0	34	2	1	0	0	0	0
11	2	1	1	0	0	0	35	2	1	0	0	0	0
12	1	1	0	0	0	0	36		1	0	0	0	0
13	1	1	0	0	0	0	37	2	1	1	0	0	0
14	2	1	0	0	0	0	38	1	0	0	0	0	0
15	1	1	0	0	0	0	39	2		1	0	0	0
16	1	1	1	1	1	1	40	1	0	0	0	0	0
17	2	1	1	1	1	1	41	1	1	0	0	0	0
18	2	1	0	0	0	0	42	1	0	0	0	0	0
19	2	1	0	0	0	0	43	1	0	0	0	0	0
20	2	1	0	0	0	0	44	1	0	0	0	0	0
21	1	1	0	0	0	0	45	1	0	0	0	0	0
22	1	1	0	0	0	0	Total	64	36	11	4	2	2
23	1	1	0	0	0	0							
24	1	0	0	0	0	0							

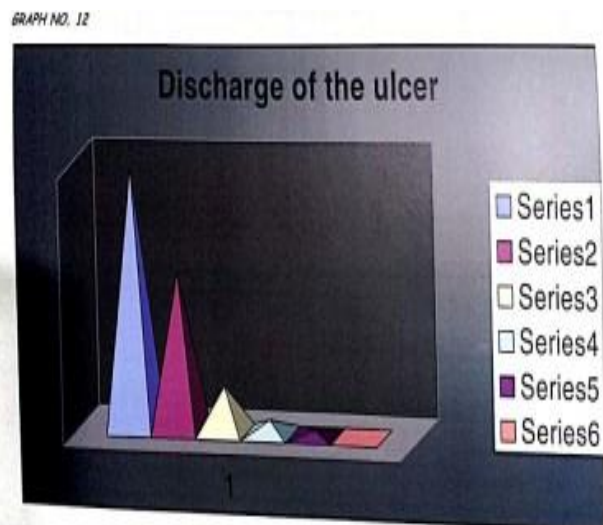
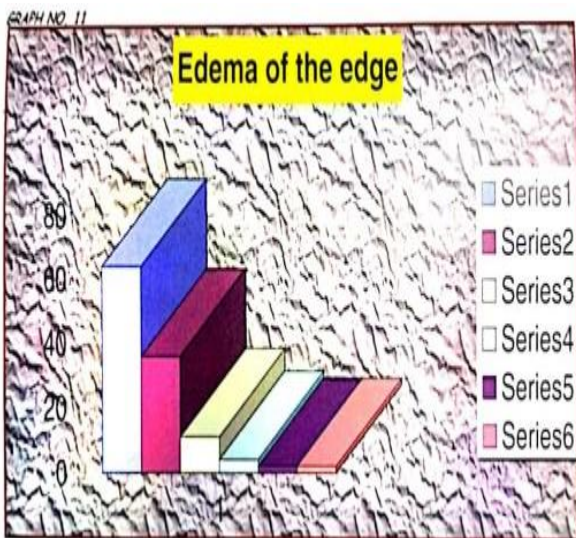


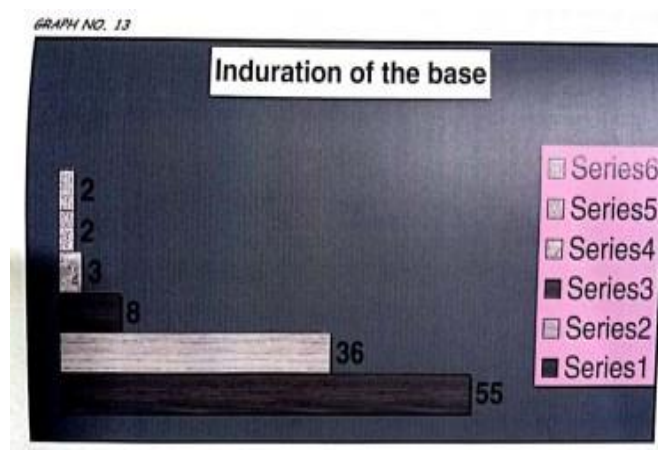
Table No. 12

Sr. No.	Dishcharge of the base													
	Before Treatment	After Treatment					Sr. No.	Before Treatment	After Treatment					
		I st	II nd	III rd	IV th	V th			I st	II nd	III rd	IV th	V th	
1	2	1	1	0	0	0	25	1	1	0	0	0	0	
2	2	2	1	0	0	0	26	1	1	0	0	0	0	
3	2	1	1	0	0	0	2	1	1	0	0	0	0	
4	1	1	1	0	0	0	28	1	0	0	0	0	0	
5	2	1	0	0	0	0	29	1	1	0	0	0	0	
6	2	2	1	0	0	0	30	1	1	0	0	0	0	
7	1	0	0	0	0	0	31	2	1	0	0	0	0	
8	1	1	0	0	0	0	32	1	0	0	0	0	0	
9	2	1	1	0	0	0	33	1	1	0	0	0	0	
10	1	0	0	0	0	0	34	1	1	0	0	0	0	
11	2	1	0	0	0	0	35	1	1	0	0	0	0	
12	2	1	0	0	0	0	36	1	1	0	0	0	0	
13	2	1	0	0	0	0	37	1	1	0	0	0	0	
14	1	1	0	0	0	0	38	1	0	1	1	0	0	
15	2	1	1	1	1	0	39	1	1	0	0	0	0	
16	1	1	1	1	0	0	40	1	4	1	0	0	0	
17	2	1	0	0	0	0	41	1	1	0	0	0	0	

18	1	1	0	0	0	0	42	1	0	0	0	0	0
19	1	1	0	0	0	0	43	1	0	0	0	0	0
20	2	1	0	0	0	0	44	1	0	0	0	0	0
21	1	1	0	0	0	0	45	1	0	0	0	0	0
22	1	0	0	0	0	0	total	58	35	10	3	1	0
23	2	1	0	0	0	0							
24	1	1	0	0	0	0							

Table 13

Sr. No.	In Duration of the base												
	Before Treatment	After Treatment					Sr. No.	Before Treatment	After Treatment				
		I st	II nd	III rd	IV th	V th			I st	II nd	III rd	IV th	V th
1	1	1	0	0	0	0	25	1	0	0	0	0	0
2	1	1	0	0	0	0	26	1	1	0	0	0	0
3	2	2	1	0	0	0	2	1	1	0	0	0	0
4	1	1	1	0	0	0	28	1	0	0	0	0	0
5	2	1	0	0	0	0	29	1	1	0	0	0	0
6	1	0	1	0	0	0	30	2	1	0	0	0	0
7	1	1	0	0	0	0	31	1	1	0	0	0	0
8	1	0	0	0	0	0	32	1	1	0	0	0	0
9	2	1	1	0	0	0	33	1	1	0	0	0	0
10	2	1	0	0	0	0	34	2	1	0	0	0	0
11	1	1	0	0	0	0	35	1	1	0	0	0	0
12	1	1	0	0	0	0	36	1	1	0	0	0	0
13	1	1	0	0	0	0	37	2	1	0	0	0	0
14	1	1	0	0	0	0	38	1	0	1	1	0	0
15	2	2	1	1	1	1	39	1	1	0	0	0	0
16	2	2	1	1	1	1	40	1	1	1	0	0	0
17	1	1	0	0	0	0	41	1	1	0	0	0	0
18	1	1	0	0	0	0	42	1	0	0	0	0	0
19	1	0	0	0	0	0	43	1	0	0	0	0	0
20	2	1	0	0	0	0	44	1	0	0	0	0	0
21	1	1	0	0	0	0	45	1	0	0	0	0	0
22	1	1	0	0	0	0	total	55	36	08	3	2	2
23	1	1	0	0	0	0							
24	1	1	0	0	0	0							



**SUMMARY AND CONCLUSION**

This study was conducted on 45 patients of chronic non-healing ulcer in the department of JARAHYAT in Dr.M.I.J.T.U.M.College & H.A.R.K.Hospital Mumbai. The aim of this study was to evaluate the efficacy of

honey one of our Unani medicine when topically applied as thick layer on the ulcer. This study was conducted, without grouping, on the patients who were medically, mentally & physically fit. In this observational study pts.



were between the age group 20-80 yrs. The result was concluded after weekly follow up or 5 weeks.

Following observations were made

- Edema of the margin
- Tenderness of the margin
- Edema of the edges
- Edema of the surrounding area
- Discharge on the floor of ulcer
- Bleeding from the ulcer &
- Size of the ulcer.

These parameters were seen in all 5 follow-ups. The following conclusions have been drawn

- Edema of margins, edges & the surrounding area is reduced significantly
- There is significant reduction in the tenderness of margins
- Discharge is minimized significantly
- Healing is achieved significantly by significant reduction in size of ulcer

Observation and results have been evaluated and analyzed statistically and conclusion have been made after the completion of the study that the topical application of honey should be considered for reduction of edema of margins, edges & the surrounding area, tenderness of the margin, discharge on the floor of ulcer.

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