COMPARATIVE STUDY BETWEEN NIGELLA SATIVA AND ZIZIPHUS SPINA-CHRISTI EFFECTIVENESS ON SKIN A SUPERFICIAL BURN HEALING IN RABBITS.

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(Received 17 May 2014, Accepted 19 September 2014)

ABSTRACT
The present study to evaluate the third degree burn involved all skin layers (full-thickness burns), and that by using ziziphus leaf extract and nigella seed extract as an ointment.

Healthy twelve mature rabbits either sex, weighing 2-2.5 kg, bred locally were used. Divided in to two groups (ziziphus group and nigella group) six rabbits of rabbits each one burned experimentally by using fire source directly on skin surface and then treated with local application of ointment (ziziphus leaf ointment and nigella sativa seed ointment) each one on it is group with daily dressing by using medical gauze.

This study appeared the benefit effect of ziziphus ointment and nigella ointment in burn healing in histopathological changes, but the group treated with ziziphus leaf extract (ointment) was better than the other group in cellular response to inflammatory process that occur during healing by early apparition of re-epithelialization.

INTRODUCTION
It is very important for the clinician caring for a burn victim to know the depth, or degree, of burn. A first-degree burn is superficial, dry, painful to touch, and heals in less than one week. A second-degree burn is partial thickness and pink or possibly mottled red. It exhibits bulled or frank weeping on the surface. It usually is painful unless classified as deep and heals in one to three weeks. Second-degree burns commonly are caused by scald injuries and result from brief exposure to the heat source. A third-degree burn is the most serious. It appears pearly white, charred, hard, or parchmentlike. The dead skin (eschar) is white, tan, brown, black, and occasionally red. Superficial vascular
thrombosis can be observed; there also can be focal tissue loss with prolonged exposure and a soapy-looking lesion that is found in alkali burns (1).

*N. sativa L.* *Ranunculaceae*, commonly known as black seed or black cumin, is naturally distributed in various regions of Iran and other Middle Eastern and Asian countries (2). The seeds of *N. Sativa (Ranunculaceae)* are commonly used in folk (herbal) medicine all over the world for treatment and prevention of a number of skin diseases and conditions (3). Seeds contain both fixed and essential oils, proteins, alkaloids and saponins (4,5). Much of the biological activities of the seeds have been shown to be due to thymoquinone, in which the major component of the essential oils and volatile oil, that have been reported include protection against neuro and hepatotoxicity induced by either disease or chemicals (2). It would appear that the beneficial effects of the use of seeds and thymoquinone might be related to their cytoprotective and antioxidant actions, and to their effect on some mediator of inflammation (6).

The genus *Ziziphus* belongs to the family *Rhamnaceae*. This genus comprises of about 100 species of deciduous or evergreen trees and shrubs distributed in the tropical and subtropical regions of the world. *Ziziphus* species can grow either as shrublets, shrubs or trees with thorny branches and are used as a hedge to form defensive fences for animals (7). The leaves are applied locally to sores, and the roots are used to cure and prevent skin diseases (8). The leaves are applied as poultices and are helpful in liver troubles, asthma and fever (9).

*Z. spina-christi* locally known as cidir, is a multipurpose tree species belonging to the botanical family *Rhamnaceae*. It is an important cultivated tree and one of the few truly native tree species of Saudi Arabia that is still growing along with many newly introduced exotic plants (10). Medicinal plants play a key role in the human health care. About 80% of the world population relies on the use of traditional medicine, which is predominantly based on plant material (11). Scientific studies available on a good number of medicinal plants indicate that promising phytochemicals can be developed for many health problems (12). The leaves of the plant are used in the treatment of diarrhea, wounds, abscesses, swelling and gonorrhea (9). They are also used in the treatment of liver diseases, asthma and fever (13).
MATERIALS AND METHODS
Experimental Animals:
Mature twelve rabbits (male and female) were obtained from private farm in Basrah, Iraq. Their average weights were 1.5-2.5 kg and 9-12 months age old. They were acclimatized for one week in stainless steel cages and fed commercial diets, vegetables, crushed wheat and corn all over the whole experiment. They were divided into two experimental groups (6 animals for each one), and subdivided into three periods (1, 2, and 3 weeks). The skin of all animals were burned with direct exposure to fire. The two experimental groups were treated with prepared Ziziphus and Nigella ointment. The skin of surgical area of rabbits were shaved and prepared to exposure directly to fire were topically put carefully on the shaved skin (figure 1). Skin burned rabbits were housed separately under sterile conditions in isolated room cleaned with sterile solution.

(Figure 1) the burned area on the dorsal surface of rabbit

Two experimental groups were treated twice daily by the treatment materials. One of these groups treated by Ziziphus ointment, while the other by Nigella ointment.

Observations of Burns:
The areas of the burns were recorded daily to show the contracting ability of wounds. The granulations of tissues or rebuilt layers were observed. The contracting ability of burns was measured by drawing the wound. This was carried out by putting clean filter paper on the wound and on other paper. The wound shape was drowning as stamped upon the filter paper. The drown wound shape was smoothly cut. The contracting ability can be defined as the ability of the wound to become narrower than the beginning; throughout the observation of the periphery around the wound.

RESULTS

Macroscopical observation:

Clinical examination of the area of burn in one week of treated animal reveal there is a transudate and vesicles formation in the two treated group.

On two weeks of present study, the clinical observation of two treated group after two weeks show contracted of wound area with granulation tissue and there is no evidence of vesicles presence in the Ziziphus group comprise with Nigella group show little contraction with soft granulation tissues.

On three weeks clinical pictures of Ziziphus group show decrease the wound area in the size to too much contraction of wound area and there is no transudate and no presence of granulation, while in the Nigella group also show decreased in the wound area but little than in the Ziziphus group with remain the smallest area of granulations. This reveals that the healing processes is going to complete and as a result of all observations show evidence changes between two experimental groups.

Microscopical observations:

Histopathological changes:

In one week microscopical observations appear in the ziziphus group thickened epidermis and sever dermal fibrosis scab formation with inflammatory cells (poly morph nucleated cells)(figure 2), to compare with Nigella group appear the ulceration of tissue as a result of hypoxia and ischemic the burned tissue with absent of squamous cells associated with excessive of inflammatory cells.
Two week histopathological changes in skin treated with *ziziphus*, thickened epidermis and severe dermal fibrosis, have healed ulceration with little re-epithelialization (figure 4) and in the *Nigella* group show thickened epidermis with area of ulceration (figure 5). Three week histological changes of skin treated with *ziziphus*, thickened epidermis and severe dermal fibrosis, have healed ulceration and appear the hair follicles with complete epithelialization (figure 6) while in the *Nigella* group show the large hair follicles and also appear thickened the epidermis (figure 7).
Figure: (4) histological section of skin treated with *ziziphus*, thickened epidermis and severe dermal fibrosis (→) with epithelialization (↑) (two week) x10

Figure: (5) histological section of skin treated with *N.sativa*, thickened epidermis (↑) with area of ulceration(→)(two week) x10

Figure (6): Histological section of skin treated with *ziziphus*, thickened epidermis and severe dermal fibrosis (→), appear the hair follicles (↑), and complete epithelialization (↑)

Figure (7): Histological section of skin treated with *Nigella* show complete epithelialization (↑) and thickened of the epidermis (↑)
DISCUSSION

This study was undertaken to evaluate the effect of plant extract (Nigella sativa and ziziphuspinac-christi) on burned wound from contraction and histopathological changes by topical application on burned area twice daily. Wound healing is a complex and dynamic process of restoring cellular structure and tissue layers in damaged tissue as closely as possible to it is normal state. Wound contracture is a process that occurs throughout the healing process, commencing the fibroblastic stage whereby the area of the wound undergoes shrinkage. The wound undergoes contraction resulting in a smaller amount of apparent scar tissue. Granulation tissue formed in the proliferative phase is primarily composed of fibroblasts, collagen, edema and new small blood vessels this observations show clearly in Ziziphus group after one week and this agreement with (14) in study of wound healing potential of ziziphusjujube extract on albino rats. In present study shown that ziziphusleaf extract promote wound healing process mainly due to their astringent and antimicrobial properties which appears to be responsible for wound contractions and increased rate of re-epithelialization and these agree with (15) in present study of protective effect of ziziphusmauritiana leaf extract on liver injury. In recent study (16) of effect of NigellaSativa extract on tracheal responsiveness and lung inflammation in ovalbumin-sensitized guinea pigs, in this study shown the total white blood cells and eosinophil counts in the lung lavage fluid of treated group were significantly higher than those of control group, this agree with in present study when show in first week of Nigella group excessive of inflammatory cells as a result of injury response. The results showed that both Ziziphus and Nigella promoted wound contraction and shortened epithelialization period. However, the Ziziphus seemed to be more effective (17) as seen in some wounds from the current study.
دراسة مقارنة لتأثير مستخلص نبات السدر وبذور الحبة السوداء على التنام الحروق السطحي للجلد في الأرانب

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الخلاصة

فرع الجراحة والتوليد كلية الطب البيطرية-جامعة البصرة-البصرة-العراق

أجريت هذه الدراسة لتقييم الحروق من درجة الثالثة التي شملت كافة طبقات الجلد، وذلك من خلال استخدام مستخلص أوراق السدر وبذور الحبة السوداء على شكل مزCLEM. شملت الدراسة 12 أرنب (من كلا الجنسين) بالغة، وزنهم 2.5-2 كجم. قسمت إلى مجموعتين: مجموعة السدر ومجموعة الحبة السوداء. كل مجموعة شملت 6 أرنب، من خلال إحداث حروق تجريبيًا باستخدام مصدر حراري إلى درجة الاتئاد مباشرة على سطح الجلد. ثم استخدمت هاتان المادات لكل مجموعته وذلك إضافة إلى التصميم من خلال استخدام الشاش الطبي على موقع الحرق موضعياً.

ومن خلال الدراسات النسيجية المرضية، اظهرت كلا المجموعتين نتائج إيجابية، إلا أنه المجموعة المعالمة بمستخلص أوراق السدر كانت أفضل من خلال الاستجابة الخلوية للعملية الالتهابية التي حدثت أثناء عملية الالتهاب من خلال الظهور المبكر لعملية التظاهر.

REFERENCES


