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Review Article

Comparability of Wound Healing Activity Between Hepar Sulph and Aloe Vera: A Systematic Review

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Abstract

Aloe vera, a historic remedy, enhances wound dressings' therapeutic effects, promoting wound constriction and tissue regeneration. On the other hand, hepar sulph has innovative wound care approaches include dressing for managing chronic leg ulcers, particularly diabetic foot ulcers, with minimal side effects. This review study aims to compare the effectiveness of hepar sulph and aloe vera in wound healing activity. Articles were searched from different search engines by using the keywords. 'hepar sulph', 'aloe vera', 'wound healing activity', 'prevention'. Our main inclusion criteria were we choose only human study. Thirteen articles are selected from a total of 58 articles. From this review it is concluded that both aloe vera and hepar sulph accomplish their goals in distinct ways.

Keywords: - Aloe Vera, Hepar Sulph, Prevention, tissue repair, Wound Healing activity

Introduction

The body's natural response to tissue damage is wound healing. However, the vascular system, cytokines, mediators, and a variety of cell types interact intricately during wound healing, making it far from a straightforward event. The first cascade of blood vessel constriction and platelet aggregation is intended to halt bleeding. A variety of inflammatory cells begin to infiltrate after this, beginning with neutrophils. In response, these inflammatory cells produce a range of cytokines and mediators that encourage thrombosis, angiogenesis, and reepithelialization. In response, the fibroblasts deposit extracellular elements that will act as scaffolding. (Ozgok & Regan, 2023)

The primary goal of medical treatments is to promote tissue repair, since wound healing is a complicated biological process. There are many causes of skin lesions, including burns, vascular disorders, surgery, and trauma (Dat *et al.*, 2012). There are three stages to the dynamic process of wound healing. Inflammation, congestion, and leukocyte infiltration characterize the first stage. Dead tissue is removed in the second phase of proliferation, and the creation of fibrous tissue and epithelial regeneration occur in the third phase (Reddy *et al*., 2011).

In general, wounds heal in four to six weeks. Wounds that take longer than this to heal are considered chronic. Impaired healing may be caused by several circumstances. Hypoxia, bacterial colonization, ischemia, reperfusion damage, modified cellular response, and abnormalities in collagen production are the main contributing causes. These might be brought on by chronic illnesses like smoking or malnutrition or systemic diseases like diabetes. Localized conditions such as pressure, tissue edema, hypoxia, infection, maceration, and dehydration may hinder the healing of wounds (van Koppen, & Hartmann, 2015).

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Aloe vera has been the subject of several research, all of which have shown its efficacy in both preventing and curing skin lesions. Since 1500 BC, aloe vera has been utilized as medicine in several nations, including Greece, China, and Mexico. For millennia, it has also been used as a traditional medicine to treat a variety of illnesses and skin conditions (Shelton, 1991). Native to Iran, Saudi Arabia, and tropical Madagascar, aloe vera is a plant. It is a perennial herbaceous plant that resembles a cactus and is a member of the Liliaceae family. Its long, thick leaves are meaty. Aloe vera was an essential element of the Egyptian princesses Cleopatra and Nefertiti's daily beauty regimen (Ghaffarzadegan *et al*., 2013). Aloe vera is reported to contain 75 different chemicals, including water, vitamins, 20 different amino acids, and minerals (Subramanian *et al*., 2006; Sahu *et al.*, 2013). Aloe vera has been shown to suppress thromboxane, an inhibitor of wound healing, enhance the healing process, and lessen inflammation in both in vitro and in vivo investigations (Shelton, 1991; Heck *et al.*, 1981). The magnesium lactate in the gel can stop the production of histamine, a chemical that makes the skin itch and become irritated (Somboonwong *et al.*, 2000; Bunyapraphatsara *et al.*, 1996). Due to its high concentration of polysaccharides like mannose, the molecule glucomannan is responsible for its healing qualities. Glucomannan enhances the activation and proliferation of fibroblast growth factor receptors, increasing the synthesis of collagen. Aloe vera gel may enhance wound healing by altering the composition of collagen, increasing collagen cross-linking, and increasing the quantity of collagen in wounds (Boudreau & Beland, 2006).

Hepar sulphuris calcareum is a mineral compound made by heating the inner layer of oyster shells that are rich in calcium and combining it with sulfur flowers. It was developed by Samuel Hahnemann to combine the benefits of Calcarea carbonica and sulfur, two more homeopathic remedies. Hepar sulphuris calcareum is effective for numerous diseases when prepared homeopathically. Hepar sulph 30C cures a dry cough that is uncomfortable and hoarse, which is aggravated by cold liquids and air. In addition to treating illnesses like tonsillitis and bronchitis with hoarse cough, dental infections, and even pink eye, skilled homeopaths will also administer Hepar sulph (Demarque *et al.*., 2007). One method of wound treatment used nowadays is hepar sulph dressing (Gadde *et al.*, 2018; Greeshma & Dastagiri, 2021). In order to treat symptoms like discomfort, weakness accompanied by pain, bronchitis and cough, pause developing in minor injuries, itching accompanied by cough and emphysema in the esophagus, pause in the kidney, and mucus membrane, Nash invented Hepar Sulphuris Calcareum (Jangda & Harihar, 2022). Hepar Sulfur's effects were comparable to those of erythromycin. While Hepar sulfur is a natural medication that doesn't harm fish or other animals, erythromycin is a chemical antibiotic (Taylor *et al.*., 2017). Hepar sulphuris works well for treating chronic leg ulcers, particularly varicose and diabetic foot ulcers (Gadde *et al.*, 2018; Greeshma & Dastagiri, 2021).

The current study aimed to review research studies on this topic, taking into account the availability of several clinical trials on the effects of Aloe vera and hepar sulph on the prevention and healing of skin wounds, as well as its popularity among people and widespread use in the cosmetic industry and homeopathy.

Material and Methods

Search Strategy

Publications from both domestic and foreign periodicals were taken into account. Selected articles from the Cochrane Library, ScienceDirect, MEDLINE, PubMed, Google Scholar, and Scopus were published online between 2010 and 2024. In addition, more sources of information were looked for in the recognized publications' references. Aloe vera, Hepar sulphur, wound healing, and prevention were the keywords that were employed. Electronic searches were conducted using all keywords, and duplicate articles were excluded after screening the titles and abstracts of all found papers. Every article was written in English.

Inclusion Criteria

The analysis covered all clinical studies using Aloe vera gel and Hepar sulph cream, or their derivatives, that included a placebo-controlled control group or compared the therapies to other treatments. In this analysis, we solely take human trials research into account. In this article keywords are used for searching the articles are Aloe Vera, Hepar Sulph, tissue repair, Wound Healing activity. Articles selected for this study must be published after 2010. For the research article all human trials are selected for this research.

Exclusion Criteria

Studies that used animal models, didn't give full texts, or didn't make their statistical data clear and also those are published before 2010 were not included.

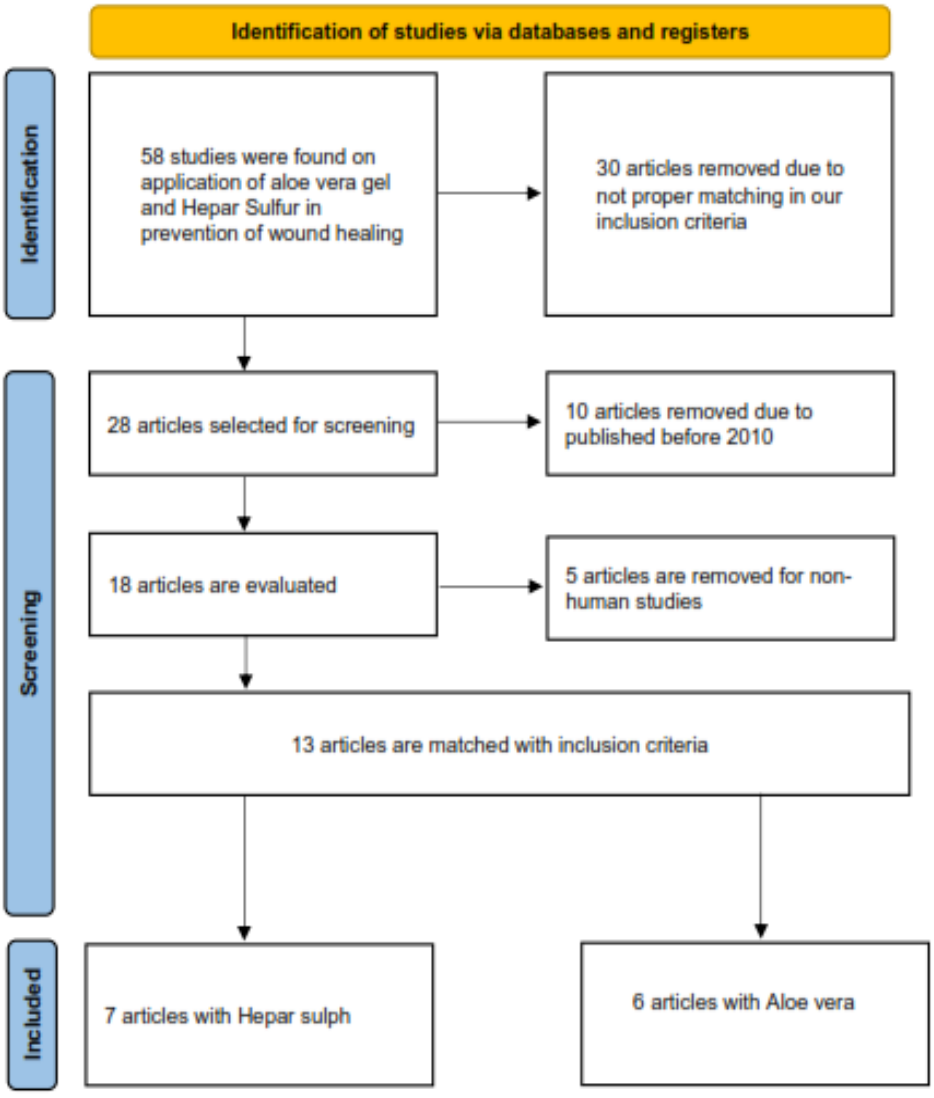

Figure 1: PRISMA checklist for article selection

Results

In total, 58 articles were identified out of which 30 were not matched with inclusion criteria, 10 articles removed due to published before 20210, 5 articles removed for non-human studied. Thirteen articles were selected for further evaluation.

Table 1: Analysis of studies using Hepar sulphur for wound healing process

Article	Type of research	Methods	Results
Kumar, 2024	Case study	A male patient with eczema on his hands and legs received his first prescription for hepar sulph at 30C in two doses.	The patient's overall health and skin issues significantly improved as a result of this medication. The scorching and anguish lessened in severity.
Kiran *et al.*, 2023	Case study	One patient had yellowish ulcer on the left lower part of the left leg, above the ankle region for 6months, The patient was prescribed hepar sulp 200c, 3doses	Case got a lot better, but what's more important is that the patient's health in general got better as well.
Muhammed, 2023	Case study	A male patient, 60 years old, who had previously received an EP diagnosis, showed significant involvement of 80–90% of his body surface area. Hepar sulfur 30C was used to treat him, followed by stronger potencies according on the situation.	The patient's problems gradually subsided without becoming worse,
Potdar, 2022	Case study	The 34-year-old woman had irregular menstruation since menarche, hyperlipidemia, spring and autumn allergies, itchy throat, swollen ears, and itchy eyes. Hepar sulfur 30 C was administered every 4 hours for three days as an emergency treatment for "sensitivity of affected parts" and to encourage suppuration.	Her menstrual periods regularized and her allergies significantly reduced.
Valdés *et al*., 2018	Research article (50 sample)	The people who took part were all given Hepar sulphur 30cH for 10 days and were checked on at 1, 2, 3, 5, 7, and 10 days.	Almost all of the people who took part (98%) said their pain was gone after 72 hours of homeopathic treatment, and most (8%) said they were happy with the care they got.
Gadde *et al*., 2018	Case study	A 43-year-old female patient with a history of diabetes appeared with a 4-year-old severe ulcer on the sole of her left foot. Hepar sulph was chosen, and the 30th potency was administered.	Following almost a year of Hepar sulph medication, the ulcer healed and the infection significantly decreased (the Diabetic Foot Ulcer Assessment Scale showed an improvement of 85.2%).
Sathye. 2016	Case study	Based on the histology, 200C strength hepar sulphuris was given every two hours for two days.	Hepar sulphuris most likely affected the endogenous infection in addition to the ocular abscess since there was no subsequent recurrence.

Table 2: Analysis of studies using Aloe vera for wound healing process

Article	Type of research	Methods	Results
Daphne *et al*., 2019	Research article (60 sample)	Thirty samples were chosen for the experimental group, with ten samples in each of the three categories. In each group, the aloe vera gel dressing was used for ten days.	The individuals with diabetes mellitus who received the intervention saw improvements in wound healing and a reduction in the severity of their wounds.
Maniei *et al*., 2019	Case study	The patient, a 62-year-old man, had five plantar ulcers on both feet (two on the right foot and three on the left), and he had had type 2 diabetes for ten years. After applying aloe vera gel to the ulcer, it was covered with a cloth. Meanwhile, the control foot was exposed to a standard red bulb, which resembled an infrared lamp, for 20 minutes at a distance of 35 cm. After that, the ulcer was covered with placebo gel.	When aloe Vera gel was applied after infrared radiation, ulcer healing took a lot less time than it did for the control group.
Avijegan *et al*., 2016	Research article (60 samples)	study including sixty individuals with persistent ulcers Participants were split up into two groups, each consisting of thirty patients. Aloe Vera gel was added to the standard therapy in one group, whereas the conventional treatment alone was used in the other.	Thirteen (46.7%) patients in the control group and twenty-eight (93.3%) patients in the aloe vera group reported wound healing at the three-month follow-up. Those with persistent ulcers might benefit from and save money on aloe vera gel.
Panahi *et al.*, 2015	Research article (60 samples)	60 patients with chronic wounds—41 with pressure ulcers, 13 with diabetic wounds, and 6 with venous ulcers—were gathered, randomly assigned to two groups of 30, and given normal treatment—that is, either AVO cream or phenytoin cream—for 30 days.	The AVO cream group showed substantial improvements in the following areas: peripheral tissue oedema score; necrotic tissue type and quantity; exudate type and amount; color of the wound surrounds.
Banu *et al.*, 2012	Research article (30 samples)	Topical aloe vera gel was used to treat 30 patients with leg ulcers infected with multidrug-resistant organisms, while topical antibiotics were applied to 30 age- and sex-matched controls.	After 11 days, 28 out of the 30 instances had no increase, and 2 had no reduction in the number of germs. As an alternative to the often used topical anti-microbial medicines, aloe vera gel formulation is less expensive and effective even against multi-drug resistant pathogens.
Viswanathan *et al.*, 2011	Research article (40 samples)	Aloe vera (4.85%) was included in a polyherbal formulation cream that was used to treat 40 type 2 diabetes patients in two groups who had foot ulcers.	Diabetic foot ulcers may be effectively treated with the polyherbal cream. If you have diabetic foot ulcers, this might be a substitute for the silver sulphadiazine lotion that is used.

Hepar sulphurand Aloe vera have wound healing activity can clear from table one and two. Both are effective on skin rash, ulcers diabetic ulcers, chronic anal fissure wounds and many skin injuries.

Discussion

Hepar sulph is a homoeopathic remedy with affinity for suppurative processes and delayed healing, which is most suited in the cases where acne is painful & sensitive and more in the form of boils & abscesses (Bidwalkar & Baswal, 2021). The originator of homeopathy, Samuel Hahnemann, is credited with creating the homeopathic treatment hepar sulphuris. Hahnemann created Hepar sulphuris calcareum, or Hepar sulph. as it is more often known, by burning sulfur flowers and the inner layer of oyster shells (Calcium carbonica). It is sometimes referred to as Hahnemann's calcium sulfide or calcium sulfide. The treatment was called after the Latin word for liver, hepar, since certain sulfur compounds resembled liver in color.

Hepar sulph. is recommended by homeopaths for infections caused by *Candida albicans*, syphilis, sinusitis, conjunctivitis, colds, coughs, sore throats, croup, abscesses, earaches, inflamed cuts and wounds, asthma, arthritis, emphysema, herpes, constipation, and skin diseases. Hepar sulph. works by stopping pus from forming and speeding up the healing of abscesses. Hepar sulphuric acid is really one of the greatest treatments for abscesses, however it works best when the abscess is not yet open. The Hepar sulph. abscess hurts like a needle and is enlarged.

Exposure to cold, dry weather is a common cause of Hepar sulphuric colds. Runny noses and sneezing are brought on by chilly winds. The mucus is first liquid before thickening, becoming yellow, and developing an unpleasant odor. The nose may lose its ability to smell and is bloated, red, and sensitive. There might be a cough, sore throat, and hoarse voice. Moreover, the patient can be constipated.

The effectiveness of homoeopathic medicines at potencies of 6C, 12C, 30C, 200C, 1M, and 10M, including antimonium crudum, arsenic album, hepar sulphur, silicea, and kalibichromicum, was examined by Pasalkar *et al.*, (2019) in order to combat *Staphylococcus epidermidis* with antibacterial activity. The MIC test, bactericidal activity, and the Agar well diffusion technique were all utilized to screen medications. The results of this experiment showed that homoeopathic medications may kill *Staphylococcus epidermidis* germs.

Hepar sulphuris is also used to treat certain conditions that are often seen in COVID-19 patients, such as tonsillitis, rhinitis, bronchitis, and chronic urticaria (Dalpati *et al.,* 2023).

An established medicinal plant with enormous promise for treating skin wounds is aloe vera. Aloe gel and aloe extract both aid in the in vivo and in vitro healing of wounds.(Burusapat *et al*., 2018). A multitude of active substances, such as polysaccharides (such as glucomannan, acetylated polymannan, acemannan, and mannose-6-phosphate), aloin, emodin, rhein, aloesin, and vitamin, are necessary for wound healing. These compositions' antimicrobial, anti-inflammatory, antioxidant, and immunomodulatory qualities promote the healing of skin wounds (Liang *et al*., 2021).

Aloe vera's abundant aloe polysaccharides, which have anti-inflammatory and immunomodulatory properties, are essential for accelerating wound healing. Aloe polysaccharides, such as glucomannan, acetylated polymannan, and acemannan, have been shown to have anti-inflammatory properties because to their ability to down-regulate matrix metalloproteinase-9 (MMP-9) and lower interleukin-5 (IL-5) and interleukin-10 (IL-10) (Liang *et al.*, 2021). Aloe polysaccharide affects the formation of granulation tissue and wound healing by increasing the production of glycosaminoglycan and collagen. It also regulates the expression of MMP-3 and tissue inhibitor of matrix metalloproteinase 2 (TIMP-2) genes in dermal wound repair at the transcriptional level (Liang *et al*., 2021; Yousef et al., 2016).

Aloe vera has other components that aid in the healing of wounds. Research conducted both in vitro and in vivo has shown that 5.5 kDa glycoprotein may promote the creation of epidermal tissue and

hasten the proliferation of human keratinocytes. In hairless mice, this glycoprotein component greatly accelerated wound healing (Liang *et al.*, 2021).

Aloe vera's many vitamins are also beneficial for the healing of wounds. Because vitamin E is a potent antioxidant, ROS damage may be prevented. Moreover, it controls transcription and gene expression as well as the expression of connective tissue growth factor (CTGF) to enhance wound defense against infections including methicillin-resistant *Staphylococcus aureus* (MRSA). Because it is a necessary co-factor for the hydroxylation of proline and lysine residues in procollagen, vitamin C promotes the synthesis of collagen. Its capacity to improve immunological function is another significant part of its involvement in wound healing (Liang *et al.*, 2021).The use of Aloe Vera Gel dressing on wounds in the 60 patients with diabetes mellitus at the government hospital in Dindigul, India, shows that the intervention was successful in lessening the severity of the wounds and promoting wound healing (Daphne & Prince, 2019).

More research is required to guarantee that Aloe vera gel and Hepar Sulph reach the pharmaceutical market. There is no effective conventional therapy, and few research have been published on the therapeutic benefits of natural items such aloe vera gel and hepar sulphate to enhance local retention time. Future remedies may be derived from medicinal plants, which have less adverse effects and higher bioavailability for the wound healing process. Furthermore, in the future, a significant issue will be the creation of an intelligent therapy with cumulative anti-inflammatory, antibacterial, and antioxidant capabilities for the treatment of all kinds of wounds. Furthermore, the commercialisation and use of natural wound healing products in preclinical research and clinical practice must be further enhanced in order to find the potential of these products, which are regarded natural bioactive compounds, in the treatment and regeneration of skin tissue. Future research should focus on discovering novel natural bioactive chemicals with applications in wound healing and the potential to replace current antibiotics.

Conclusion

It has been seen from the seven articles result that use of Hepar Sulph in wound healing is very effective and six articles result shows that Aloe vera is also effective in wound healing. Healing from wounds using hepar sulph, a medicinal method that effectively treats wounds by easing symptoms and stopping the development of infection. Similarly, other types of ulcers may be treated by using the wound-healing process with aloe vera. For wounds, aloe vera's analgesic, antibacterial, anti-inflammatory, and antiseptic qualities are invaluable. Aloe vera and its components have the ability to keep skin hydrated and healthy. They accomplish their goals in distinct ways.

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Conflict of Interest:

There are no conflicts of interest.

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