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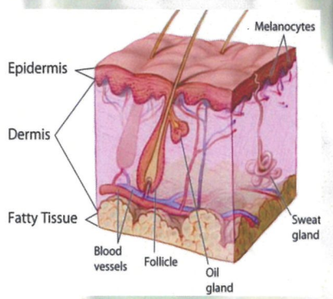
Aloe Vera: A treatment for Second Degree Burn Wounds



Aloe Vera (*Aloe Barbadensis* Miller) is part of the *liliaceae* family, and is a traditional medicine that has been valued in many countries for thousands of years for its dermatological healing abilities (Ahlawat & Khatkar, 2011). The natural burn wound healing components of Aloe Vera are present in the viscous fluid layer, and are abstracted by piercing the outer cuticle layer of the leaf. Second degree burn wounds are classified as a burn that involves the destruction of the epidermis layer of skin along with significant amount of the dermis layer (Tiwari, 2012). The topic of the efficacy of healing of Aloe Vera gel on burn wounds will be discussed as found in primary health settings in New Zealand.

Wound Healing Capabilities

Aloe Vera has been shown to have positive outcomes when it comes to healing of second degree burn wounds. This can be credited to the presence of acemannan (β-(1,4)–acetylated polymannose), which is the main polysaccharide found in the gel. Acemannan has been scientifically proven to stimulate the expression of a range of wound healing factors such as vascular endothelial growth factor (VEGF), keratinocyte growth factor-1 and type 1 collagen (Majewska & Gendaszewka-Darmach, 2011). Together these wound healing growth factors contribute to the restoration of secondary intention wounds. Evidence has shown that the mean wound healing time with the use of Aloe Vera gel is 11±4.18 days (Shahzad & Ahmed, 2013).

Anti-Microbial Properties

As burn wounds are highly susceptible to micro-organism growth due to the absence of the skin, it is important that there is an anti-microbial defense present when managing burn wounds. The Aloe Vera gel comprises of four anti-microbial compounds that act to provide a barrier of protection against infection: p-coumaric acid, ascorbic acid, pyrocatechol, and cinnamic acid (Lawrence, Tripathi & Jeyakumar, 2009). Mechanisms on how these anti-septic help fight off micro-organisms include inhibition of enzymatic activity, alteration of genetic mechanisms, and inhibition of glucose reuptake of the cell.
Together these provide a barrier against potential micro-organism growth of bacteria (both gram positive and gram negative), fungi, and viruses (Lawrence et al, 2009)

Anti-Inflammatory and Analgesic Effect

Supported in evidence-based research, Aloe Vera has shown to have anti-inflammatory effects on wound healing. The reason for this has been suggested to occur due to the presence of C-glucoysl chromone (Lawrence et al, 2009). It is believed that the C-glucoysl chromone has inhibitory action on the cyclooxygenase pathway with is related to the inflammatory response (Lawrence et al, 2009). The analgesic action of the Aloe Vera gel is still relatively unexplained; however it has been suggested that it is caused by the presence of salicyclic acid (Ahlawat & Khatkar, 2011). This has been expressed by Shahzad & Ahmed (2013) where time taken for pain relief was measured. The results stated that the mean time for complete pain relief was 12 days.

Recommendations for use of Aloe Vera in Second Degree Burn Wound Care

- Additional research into developing further information of the phytochemical compounds found within the Aloe Vera gel need to be conducted in order to evaluate the complete wound healing capacity of the fluid in relation to the preparation, extraction and processing of the gel (Lawrence et al, 2009).
- To allow the client to make their own autonomous decision about their treatment plan by providing them with evidence-based research showing both the positives and negatives of different types of treatment.
- Further research into the use of Aloe Vera gel in comparison and/or collaboration with other common techniques used to treat second degree burn wounds. This would assess healing rate of epithelialization, presence of micro-organism cultures, rate of infection, cost effectiveness, and client's overall experience (Shahzad & Ahmed, 2013).

References
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PICOT – Does Aloe Vera gel provide an effective treatment for second degree burn wounds?

PICOT Category	Relevant Information	Rationale
P – Patient or Problem	Individuals aged 18-65 years who present with acute thermal burns that are classified as second degree burns	Burns can be caused by many causative agents which require different mechanisms for healing so this study is limited to thermal burns only (Tiwari, 2012). The physiology for the healing of children (0-17 years) and older adult (65+ years) differs to that of an adult, and as a result they have been excluded (Tiwari, 2012).
I – Intervention	The use of Aloe Vera gel to prove efficacy of healing in second degree burn wounds in a hospital setting	Aloe Vera has been used for centuries as a herbal medicine for burn wounds (Ahlawat & Khatkar, 2011). It has been suggested that it improves wound healing ties, effects on micro-organisms, and analgesic effects. This question will determine whether or not these properties exist, and the rationale for use.
C - Comparison	The use of Aloe Vera gel as a treatment for second degree burn wounds	Aloe Vera is the comparison as it is the reference group in this study
O - Outcome	The outcome will provide answers to whether or not Aloe Vera gel should be considered a safe and appropriate healing strategy for treating second degree burn wounds	Outcome will consider elements highlighted in the comparison section and compare results found to evaluate whether or not Aloe Vera should be considered an ideal treatment for second degree burn wounds
T- Time	Time taken for complete wound healing will be analyzed and represent the healing efficacy of Aloe Vera gel.	Time will indicate the success of the outcome where a shorter time is equivalent to better rate of healing.