

A REVIEW: ON EFFICACY OF ALOEVERA DRESSING IN MANAGEMENT OF DECUBITUS ULCER AMONG BEDRIDDEN PATIENTS

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Abstract	<i>An experimental study on "Efficiency of aelovera dressing in management of decubitus ulcer among bedridden patients admitted in selected hospitals at Jaipur. Pressure ulcer is a continuing major health problem worldwide. The development of pressure ulcer is more prone to those patients who are confines to bed for long periods. It represents a major burden of sickness and reduced quality of life for patients and their caregivers. The result of this study reveals that aelovera gel is effective in decubitus ulcer wound healing.</i>
Keywords	<i>Decubitus, Ulcer, Alovera gel, Bed ridden patients.</i>

INTRODUCTION

Pressure ulcer is a consistently major health problem throughout Globe. Pressure ulcers represent a major burden of sickness and reduced quality of life for patients and their caregivers. Pressure ulcer usually occurs over a bony prominence cause of which is long-term pressure along with friction. The most common sites are the sacrum, coccyx, heels, and hips, and least common sites include the elbows, knees, ankles, back of shoulders, or the back of the cranium. It occur due to pressure which completely or partially obstruct blood flow to the soft tissue. The aim of the study was to evaluate efficacy of alovera dressing in management of decubitus ulcer.

NEED FOR STUDY

Early healing is much desired for patient's suffering from the pressure ulcers. when pressure ulcer develops, the length of hospital stay and overall cost of treatment raise, and treatment becomes costly, when an ulcer develops, the increased cost of nursing care alone is estimated as 50%.

STATEMENT OF PROBLEM

An Experimental study on "Efficacy of alovera dressing in management of decubitus ulcer among bedridden patients admitted in selected hospitals at Jaipur"

The **review of literature** is defined as abroad, comprehensive in depth, systematic and critical review of scholarly publications, unpublished scholarly print materials, audio visual materials and personal communications.

A literature review is a written summary of the state of existing knowledge on a research problem. The task of reviewing research literature involves the identification, selection, critical analysis and written description of existing information on a topic, (Polit and Hungler, 1999).

The review of literature will be discussed based on the following headings:-

- Studies related to the incidence and prevalence of pressure sores.
- Studies related effectiveness of alovera on pressure sores healing

STUDIES RELATED TO THE INCIDENCE AND PREVALENCE OF PRESSURE SORES

A study was conducted to find out national prevalence of pressure ulcers in French hospital in-patients. A total of 37,307 inpatients in 1170 wards in 1149 hospitals were assessed. In all 3314 patients had at least one pressure ulcer, giving a prevalence rate of 8.9%. A total of 4991 pressure ulcers were recorded 64% of the patients had only one pressure ulcer. The most common locations were the heel (53%) and sacrum (29%).¹

A study was conducted to find out the prevalence of pressure ulcers in hospital in India. A total of 445 patients hospitalized in medical and surgical wards were examined in a single day for the number, site and grade of pressure ulcers. Prevalence of pressure ulcers were high (4.94%). Anaemia, malnutrition, and diabetes were important risk factors. In India identifying their associated risk factors at an early stage may go a long way in preventing their occurrence.²

Study compared the prevalence of pressure ulcers among newly hospitalized nursing home residents and among newly hospitalized patients from Non-Nursing home settings. Study participants were at least 65 years old and admitted through the emergency department to one of two study hospitals. Research nurses ascertained the presence of pressure ulcers (stage 1–4) by visual skin assessment on the third day following admission to the hospital unit. Other data were collected by clinical examination, interview, and medical record review. The prevalence of preexisting pressure ulcers at the time of admission was 26.2% among those admitted from a nursing home and 4.8% among those admitted from another living situation (odds ratio 5.5, 95% confidence interval 4.3–7.1).³

A cross-sectional study was conducted to determine the prevalence of pressure ulcers and patient-related risk factors in inpatients receiving treatment in the province of Erzurum, located in the eastern part of Turkey. Study included 832 inpatients hospitalized for at least 24 h after admission in five hospitals in the province of Erzurum. All of the study patients were 18 years of age or older and agreed to participate in the research. Patients hospitalized in the obstetric, emergency, and pediatric clinics were excluded from the study (due to the low probability of pressure ulcers in these clinics). The prevalence of pressure ulcer. Result found 12.7%, prevalence of pressure ulcer with the highest prevalence in intensive care clinics (35.3%).⁴

A Prospective randomized, double blind, placebo-controlled trial was conducted comparing the effects of a cream containing aloe Vera versus a placebo cream on post-haemorrhoidectomy pain, in Iran. 49 patients were randomly assigned to receive aloe Vera (n=24) and placebo (n=25). Pain was assessed with a visual analogue scale immediately post-operatively and at hours 12, 24, and 48 after surgery and at weeks 2 and 4. Wound healing was examined and evaluated at the end of 2 and 4 weeks. Patients in the topical aloe cream group had significantly less post-operative pain at 12, 24, 48 hours. Aloe Vera cream reduced the pain after defecation in 24 and 48 hours ($p < 0.001$). Wound healing at the end of the second post-operative week was significantly greater in aloe Vera when compared to placebo group. The use of analgesics was recorded.⁴

A study conducted on 60 patients for management of psoriasis with aloe Vera extract in a hydrophilic cream, every subject had 4 weeks active treatment and during treatment progressive reduction of desquamation followed by decreased erythema, infiltration, resulting in moderate to excellent improvement to complete resolution of psoriatic lesions was noted. The mean duration of the disease prior to entry was 8.5 years. By the end of 4 weeks 45% patients and 46% of psoriatic plaques were cured, resulting in a score from a mean 9.3 to 2.2. The aloe vera cream cured 83.3% significantly larger number of patients than placebo 6.6% ($p < 0.001$). The active group also shows aloe Vera has healed chronic plaques 82.8% and placebo 7.7%.⁵

A systematic review methodology, quantitative design studies which explored prevalence data

and/or the epidemiology of PUs in Europe conducted which included 79 articles in this review. Across the studies, the median prevalence was 10.8% (standard deviation: 7%; range: 4.6–27.2%). The highest PU prevalence reported was from the Netherlands (27.2%; n=17,494 participants), and the lowest was reported from Finland (4.6%; n=629 participants). Almost 32.4% (n=151,195) of the PUs were category I and the most common site for PUs was the sacrum.⁶

In a retrospective study of over 50,000 patients, Lyder et al. [20] found that of the 2313 patients with hospital acquired pressure ulcers 33.9% suffered from CVA compared to the patients without pressure ulcers of whom only 22.4% suffered from CVA ($p < .001$). 1013 (43.8%) patients with pressure ulcers suffered from CHF compared to the patients without pressure ulcers of whom only 28.4% suffered from CHF ($p < .001$).⁷

A study in the UK found that one year after stroke, PU prevalence was high (above 20%) both among people living at home and among people living in the community.⁸

In an outpatient setting, Margolis et al. [19] found that the prevalence of CVA among patients with PU was 13.1% with an adjusted RR for PU of 1.57. The prevalence of CHF was 13.4% and the adjusted RR for PU is 1.39; Deep vein thrombosis (DVT) prevalence was 2.2% with adjusted RR for PU 1.39. Lower limb edema prevalence was 17.2% with adjusted RR for PU 1.37.⁹

Pressure Ulcers in the United States' Inpatient Population From 2008 to 2012: Results of a Retrospective Nationwide Study in which Among 676 435 pressure ulcer patients, 540 073 (79.8%) had 1 recorded pressure ulcer, 105 383 (15.6%) had 2 pressure ulcers, and 30 979 (4.6%) had more than 2. The most common area for pressure ulcers was the patients' lower back (lower back/sacral/coccygeal areas per ICD-9) (47%); 17% were located on the patients' buttock, 14% on the heel, 9% other locations, and 5% on the hip. The ankle, upper back, elbow, and locations not otherwise specified each accounted for <5%. Of the 540 073 pressure ulcers identified, 79 026 (16%) were Stage 1, 191 308 (38%) were Stage 2, 101 093 (20%) were Stage 3, 97 083 (19%) were Stage 4, and 36 081 (7%) were unshakable according to ICD-9 coding (see Figure 3). The median stage of pressure ulcers was 2 for men, women, and Caucasians; the median stage in African Americans was 3. Persons concurrently suffering from malnutrition had a median stage of 3; persons with hypotension, PVD, incontinence, CVD, diabetes mellitus, and vertebral/femur fractures had a median stage of 2. A total of 71 418 excisional debridements were performed in 65 582 patients; 5462 patients required multiple procedures. A longitudinal prospective study conducted in the homes of 40 elderly identified with risk for pressure ulcer (PU) at hospital discharge, using the Braden Scale. The monitoring was conducted over four home visits, in the period between June and August of 2010, in Fortaleza (CE) and its metropolitan region. The majority of the elderly were female (65%) with a medical diagnosis of cerebral vascular accident (55%). In the first and second visits, 55% and 40% of the elderly, respectively, presented high risk for PU, and the incidence of PU was 22.5%. The association of the risk scores presented significant association in the first three visits.¹⁰

Pressure Ulcers Prevalence in the Acute Care Setting: A Systematic Review, 2000-2015 reveals that prevalence range of between 7.8% and 54% for those using European Pressure Ulcer Advisory Panel methodology, 6% and 22% for those using National Pressure Ulcer Advisory Panel methodology, and 4.94% for the study that employed the Torrance system. The likely worldwide PrU prevalence rate range in acute care settings is between 6% and 18.5%.¹¹

Kristen Mahoney in 2018 prevalence of pressure ulcers in the UK More recently Clark et al (2017) reported an 8.9% prevalence of pressure ulcers across all acute and community hospitals across Wales.¹²

Shuji Nakashima 2018 in Japan in which the 1126 participants, 113 (10%) had one or more pressure injuries. Overall, the estimated number of adults with pressure injuries in Goto was 301.4. The prevalence rate of pressure injuries was 9.2 per 1000 population in adults aged ≥ 18

years (95% confidence interval [CI] 8.1–10.2), 20.3 in those aged ≥ 65 years (95% CI 18.1–22.7), and 44.6 in those aged ≥ 80 years (95% CI 39.5–50.2).¹³

An observational, cross-sectional descriptive study by **Paul Fulbrook 2019** observed that pressure injuries were identified in 11 of 212 participants, giving a prevalence of 5.2% at presentation. Nearly all were admitted to hospital, giving a prevalence of 7.8% at this entry point.¹⁴

Ling Gao, Lina Yang 2018 conducted a study to investigate risk factors for intraoperative pressure ulcers and provide a scientific basis for predicting the occurrence of pressure ulcers in the operating room. Methods: We used a prospective analysis design with single-factor analysis and a logistic regression method. Data were collected for 1052 patients, who underwent neurosurgery, orthopedic surgery, pediatric surgery, or heart surgery between October 2014 and April 2015 at Sichuan Academy of Medical Sciences & Sichuan Provincial People's Hospital in China. Results: There were 26 cases (2.47%) of intraoperative pressure ulcer occurrence.¹⁵

A randomized, triple-blind clinical trial study was done to investigate the effect of *Aloe Vera* gel on the prevention of pressure ulcer in patients hospitalized in the orthopedic ward. This study is a which was done on 80 purposefully selected patients in orthopedic ward in Arak town, Iran, 2016. Patients were randomly assigned into two intervention and control groups based on blocking sampling method. In each group the routine daily cares to prevent bed sores were performed by nurses. In the intervention group in addition to routine nursing care to prevent bed sores, twice a day (hours of 9 and 21) pure *Aloe Vera* gel on the areas of hip, sacrum and heel were rubbed, but in the control group placebo (gel of water and starch) were used. Then sacral, hip and heel of both groups on days 3, 7 and 10 for signs of pressure ulcers was evaluated. The mean age of patients in the control group was (42.34 ± 12.19) and in the intervention group was (41.71 ± 11.50) years, respectively. In the intervention group 1 patient afflicted with sore of hip and two people with sacral pressure ulcer. In the control group 3 patients afflicted with sore of hip, 8 people with sacral pressure ulcer, and 1 person had pressure sore of heel. Analysis of the data showed that both groups had statistically significant differences in the incidence of pressure ulcers ($P = 0.047$). This means that *Aloe Vera* gel could prevent the occurrence of pressure ulcers in the intervention group.¹⁸

A study was conducted to test herbal formulations having *Aloe Vera* gel powder for its efficacy and activity on bed sores. *Aloe Vera* gel powder with high molecular weight (AHM) was prepared from the gel part, by washing with running water using the patented freeze-drying under micro wave and far infra-red irradiations in which barbaloin content was less than 10 ppm in powder form. The treatment was given by applying the macromolecule aloe ointment for bedsores from I degree to II degree ulcer patients. The results have shown that AHM in the ointment form indicated a high possibility to cure bedsores. Being very difficult to cure, due to the patient's peculiar conditions such as old age, inability of the patient to turn by himself/herself and also due to complications caused by other symptoms.¹⁹

A literature review done in Canada in 2004 found that the overall prevalence of pressure ulcers across all institutions studied was 26 per cent. Although 50 per cent of these were Stage 1 ulcers, this data is still disturbing (Woodbury & Houghton, 2004). Pressure ulcer incidence rates vary considerably by clinical setting — ranging in the United States from 0.4 per cent to 38 per cent in acute care, from 2.2 per cent to 23.9 per cent in long-term care, and from 0 per cent to 17 per cent in home care. It is estimated that pressure ulcer prevalence (the percentage of patients with pressure ulcers at any one point in time) in acute care is 15 per cent, while incidence (the rate at which new cases occur in a population over a given time period) in acute care is seven per cent. It is estimated that 2.5 million patients are treated for pressure ulcers in U.S. acute healthcare facilities each year.¹⁶

Pressure ulcer prevalence among hospitalized adults in university hospitals in South-west

Nigeria Pressure ulcers are recognized universally as a largely preventable patient safety problem and a measure of the quality of care provided by health institutions. The prevalence of pressure ulcers among hospitalized patients in Nigeria has been sparingly reported. This study investigated the prevalence of Stages II to IV pressure ulcers among hospitalized adults in the six university hospitals in South-west Nigeria. Participants were all hospitalized adult patients in the six university hospitals in South-west Nigeria. Data collected included age, gender, anatomical location of the pressure ulcer, and presence/absence of a relative by the patient's bedside. The mean age of patients with Stage II pressure ulcer and higher was 47.0 ± 21.2 years. Prevalence of Stages II to IV pressure ulcers ranged between 0% and 6.9% in the hospitals and overall prevalence was 3.22%. Prevalence rates in male and female patients were 3.59% and 2.83% respectively. The most common anatomical locations for pressure ulcer were the ischial tuberosity, sacrum and greater trochanter. Most (92.3%) of the patients that had pressure ulcers also had relatives staying at their bedsides. The prevalence of Stages I to IV pressure ulcers observed in this study was similar.¹⁷

The present study aimed to systematically review clinical trials regarding the effect of Aloe vera on the prevention and healing of skin wounds. All clinical trials using Aloe vera gel, cream, or derivatives that included a control group with placebo or comparison with other treatments were included in the study. The PRISMA checklist (2009) was used to conduct the review. In total, 23 trials that met the inclusion criteria were studied. The results of the studies showed that Aloe vera has been used to prevent skin ulcers and to treat burn wounds, postoperative wounds, cracked nipples, genital herpes, psoriasis, and chronic wounds including pressure ulcers. Considering the properties of Aloe Vera and its compounds, it can be used to retain skin moisture and integrity and to prevent ulcers. It seems that the application of Aloe vera, as a complementary treatment along with current methods, can improve wound healing and promote the health of society.²⁰

A study to evaluate the effectiveness and rate of healing of Aloe vera gel in treatment of chronic wounds, to compare the effectiveness of Aloe vera gel with conventional dressing (normal saline and povidone iodine) and to assess the percentage reduction of wound healing with Aloe vera gel dressing. The study was conducted at Dr. D. Y. Patil Medical College and Hospital, DPU University, for a period of 2 months (from January 2017 to March 2017) and is a prospective and comparative randomized type of study using 50 cases (Group A and Group B, 25 each). The study was approved by the Institute's Ethics Committee. Data analysis showed that at the end of 4 weeks, mean surface area in Group A is reduced to 4.58 cm² from 9.79 cm² which is higher than that in the control group. Also, the average rate of healing in Aloe vera gel is more than control group. Percentage reduction in ulcer surface area was calculated to be much more in Group A as compared to Group B. The study concluded that Aloe vera gel is highly effective in treatment of chronic ulcers and stimulates the growth of wound healing. Thus, reducing the hospital stay. Apart from being efficacious in wound healing, Aloe vera gel is safe product. No allergic reactions/infections were associated with Aloe vera gel. Aloe vera gel not only heals faster but is also cost effective.²¹

A true experimental study was done to determine the effect of Aloe Vera gel as a dressing on the wound healing time of *Mus musculus* (Albino mice) in Lapu-Lapu City, Cebu, Philippines. The subjects used in this experiment included sixteen healthy male Albino Mice weighing fifteen to twenty grams with sized ranging from five to ten centimeters and were five to ten months old. Eight were utilized as the experimental group and the other eight for the positive control group. Preliminary preparations included submission of transmittal letter, preparation of the cage and purchase of Aloe Vera gel and Betadine solution. Autoclaving of materials for extraction of Aloe Vera gel and the preparation of Aloe Vera gel then, follows. The subjects were purposely sampled and randomly allocated to the experimental control group and positive

control group, each having eight subjects. The mice were acclimatized for one week prior to the actual 10-day experimental period. The area of incision was disinfected with alcohol swab, followed by incision of a wound measuring ten millimeters in length and 1 millimeter in depth, using a feathered lancet, in a shaved area on the left Gluteus Maximus. The experimental control group was given Aloe Vera gel and the positive control group was given Betadine solution on the wound. After application of the treatment, band aid was placed on the incised wound. Prior to re-treatment, the wound was inspected every eight hours and the period of the completely healed wound was timed using a digital stopwatch. Collected data were recorded in an observation sheet and processed using Microsoft Excel. The mean scores and standard deviation of the two groups was calculated and the significant difference between groups was determined using the Independent Samples Test. An associated p-value of less than 0.05 was considered significant. The healing time of Aloe Vera gel in the experimental group was $x = 93.2363 \pm 0.04061$ hours, which was significantly faster, compared to Betadine solution in the positive control group with a $x = 109.1088 \pm 0.01458$ hours ($p < .05$ alpha levels).²²

A clinical trial study was conducted to evaluate the efficacy of aloe vera cream for partial thickness burn wounds and compare its results with those of silver sulfadiazine (SSD). Thirty patients with similar types of second-degree burns at two sites on different parts of the body were included in this study. Each patient had one burn treated with topical SSD and one treated with aloe cream, randomly. The rate of re-epithelialization and healing of the partial thickness burns was significantly faster in the site treated with aloe than in the site treated with SSD (15.9 ± 2 vs 18.73 ± 2.65 days, respectively; $P < 0.0001$). The sites treated with aloe were completely healed in less than 16 days vs 19 days for the sites treated with SSD. These results clearly demonstrated the greater efficacy of aloe cream over SSD cream for treating second-degree burns.²³

An evaluative approach study was conducted to assess the effectiveness of Aloe Vera Gel dressing on wound status among patients with diabetes mellitus. It was used for the study. The design used for this study was quasi experimental non-equivalent pre-test post-test control group research design. Sample size was 60 out of which 30 were in experimental group and 30 were in control group. The sample selected by non-probability purposive sampling technique and the wound status was assessed using Bates Jenson wound assessment scale (BWAT). The paired 't' value 18.333 showed that posttest level of wound status was lower than the pre-test level of wound status in the experimental group which was significant at $p < 0.05$. The Independent 't' value 19.386 showed that the post-test level of wound status in the experimental group was lower than the post-test level of wound status in the control group which was significant at $p < 0.05$ level.²⁴

A study was conducted to evaluate the efficacy of *Aloe vera* on wound healing following periodontal flap surgery. Fifteen patients with chronic periodontitis requiring periodontal flap surgery were included in this double-blinded, split mouth, randomized, and controlled clinical trial. Sixty interproximal sites were divided into test and control groups. The test sites received an application of fresh *Aloe vera* extract postoperatively. Postoperative healing was assessed using early healing index (EHI) after the first week and HI after first, second, and third weeks following therapy by a blinded examiner. All patients completed the study (nine male and six female, age range: 30–50 [34.15 ± 3.46] years). Better healing was observed in test sites in comparison to control sites in the first postoperative week as recorded by EHI ($P < 0.001$) and HI ($P = 0.02$). The application of fresh *Aloe vera* extract was effective in significantly improving healing scores in the first postoperative week.²⁵

A study to find out the effect of Aloe Vera's plant on healing of the wound and reducing the pain of the surgical wound in patients was investigated. 60 patients from the diabetic patients, who referred to Imam Ali Hospital in Kermanshah for CABG operation, were randomly divided into

two groups of intervention and control groups. Wound healing was evaluated on days 4, 7, and 14 after operation and daily washing with % Aloe Vera ointment, by means of Bates-Jensen wound healing scale. The amount of pain was evaluated with Visual Analog Scale (VAS) on days 3, 4, and 7 after intervention. SPSS 16 was used to analyze the data. In this research, in order to describe the methods, descriptive statistics including frequency distribution, mean, standard deviation, and in relation to the objectives and research fields and the homogeneity of the samples Chi-square and independent T-test were used. The mean and standard deviation of the total score of wound healing was compared between the two groups on days 7 and 14 after dressing were $P < 0.001$, which shows the significant difference between the healing of two groups. The rate of healing was more in Aloe Vera group. The present study shows that using Aloe Vera ointment for at least 3 days reduces the pain of the surgical wound and at least 1 week of using Aloe Vera ointment promotes the healing of surgical wound in diabetic patients.²⁶ The present study aimed to systematically review clinical trials regarding the effect of Aloe vera on the prevention and healing of skin wounds. All clinical trials using Aloe vera gel, cream, or derivatives that included a control group with placebo or comparison with other treatments were included in the study. The PRISMA checklist (2009) was used to conduct the review. In total, 23 trials that met the inclusion criteria were studied. The results of the studies showed that Aloe vera has been used to prevent skin ulcers and to treat burn wounds, postoperative wounds, cracked nipples, genital herpes, psoriasis, and chronic wounds including pressure ulcers. Considering the properties of Aloe vera and its compounds, it can be used to retain skin moisture and integrity and to prevent ulcers. It seems that the application of Aloe vera, as a complementary treatment along with current methods, can improve wound healing and promote the health of society.²⁷

CONCLUSION

This study was to evaluate the efficacy of Aloe Vera Gel in management of pressure ulcers among bedridden subjects admitted at selected hospitals Jaipur. The findings of the study showed that Aloe Vera Gel dressing was effective in healing of pressure ulcers in subjects. There was association between healing of pressure ulcer and demographic variables. As complementary therapy which is effective in healing of pressure ulcers in bedridden subjects without any complications, it can be adopted by every health care professional to improve healing and reduce the time period of healing among subjects with superficial pressure ulcers.

Key words-Efficacy, aloe Vera gel dressing, bedridden patients.

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