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Research Article

**ALOE VERA GEL VERSUS SILVER SULFADIAZINE CREAM
(SSD, 1%) IN TERMS OF WOUND DURATION &
EPITHELIALIZATION, PAIN RELIEF AND IN THE SECOND-
DEGREE BURN CASES**¹Dr. Nauman Ahmed, ²Dr. Sarmad Mehmood, ²Dr. Jahanzaib Nawaz¹DHQ Hospital Kasur²Bahawal Victoria Hospital Bahawalpur**Abstract:**

Objective: Our research was aimed at the efficacy assessment of gel of Aloe Vera in comparison to the silver sulfadiazine cream (1%) in terms of dressing for the burns to treat the partially thick and superficial burns.

Methods: Research design was comparative interventional which was carried out in the Sir Ganga Ram Hospital, Lahore (Department of Plastic Surgery and Burn Unit) in the period of July, 2015 to December, 2017 on fifty patients who had partially thick and superficial burns. We made two groups out of the total sample respectively A and B treated with Aloe Vera gel and silver sulfadiazine cream (1%). We made a comparison of the outcomes such as wound duration, pain relief, wound epithelialization and treatment cost.

Results: The Aloe Vera gel managed cases the wound healing was rapid than the silver sulfadiazine (1%). An earlier relief of pain was observed in the Aloe Vera group than the SSD group.

Conclusion: The dressing of Aloe Vera gel on the patients of thermal burns was better the SSD dressing in terms of wound epithelialization, rapid and earlier pain relief and it was also cost-effective.

Keywords: Second-degree burns, Aloe Vera gel, Silver sulfadiazine cream (SSD, 1%).

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INTRODUCTION:

Public healthcare crisis is worse on the injuries of the burn in all the categories of injuries [1, 2]. It is among the fourth repeated trauma type all over the world after RTA, violence and falls [3]. Low income countries face ninety percent of the burn injuries [4]. In the advanced wound management and antimicrobial chemotherapy infection is generally an issue in the management process. Appropriate prophylactic topical agent's utilization can be helpful in this regard.

If we maintain the wounds at low levels of colonization it will diminish duration and frequency of wound's septic episodes [5]. With the topical antimicrobial agents use there is a significant reduction in the mortality of the burns [6, 7].

SSD cream (1%) is commonly employed topical antimicrobial agent [9]. It also has few side effects such as prolonged healing of the wound healing, resistance to SSD 1%, leukopenia and renal toxicity: various authors had confirmed that prolonged use of the SSD (1% cream) is not possible and recommended [10, 11, 12].

Herbal medicine has a long relation with the Aloe Vera of the Liliaceae family [13, 14]. It is obtained through the leaf of Aloe Vera herb which contains vitamins, nutrients and antioxidants containing features like immune modulating effects and healing of the wound [15 – 19]. Healing is among the indications of the use of Aloe Vera gel which has been proved at various clinical and animal research studies, it has been compared to SSD cream (1%) by few of the authors as well [16].

PATIENTS AND METHODS:

We used (Aloe Tone Je 1-R, Aloe Vera gel) in our research which was an unrefined gel (98%) extracted from the inner part of the plant leaf. Research design was comparative interventional which was carried out in the Sir Ganga Ram Hospital, Lahore (Department of Plastic Surgery and Burn Unit) in the period of July, 2015 to December, 2017 on fifty patients who had partially thick and superficial burns. We made two groups out of the total sample respectively A and B treated with Aloe Vera gel and silver sulfadiazine cream (1%). We made a comparison of the outcomes such as wound duration, pain relief, wound epithelialization and treatment cost. Research commenced after ethical approval and patients consent. We included second degree burns cases reported in twenty-four hours and the area which was burnt was (TBSA < 25 %). All the cases with corrosive, chemical and electrical burns having

any history of hypertension, diabetes, epilepsy, pregnancy and kidney disease were not made a part of the research. Treatment with in both the groups with both the healing agents was continued till full recovery and outcomes were observed. We started 3rd generation cephalosporins and taken the wound cultures at three wound sites at first day and seventh day, then started the antibiotic intervention as per the bacteriological evaluation in all the patients.

We also documented the related data of the patient's registration, site of burn, history, TBSA, degree of burn, slough presence or absence in the wound, burn depth, operative notes, medical report, pre-operative & post-operative pictures, hospital stay duration and research outcomes. We monitored the diet of the patient in the hospital and nutrition was focused. Oral intake was preferred and few of the cases presented amino acid infusion. Each group consisted of twenty-five patients of second degree burn. Patient's demographics were also compared including age, sex etc. We also observed every case for the treatment efficacy, healing time, pain scores, cultured organism's types, infection, treatment cost and wound colonization.

Wound width and length was measured through tape, progression of the wound was measured through simple statistical formula with reference to the previous condition. Relief of the pain was observed through VAS in the range of 1 – 10 that moves from no pain to severe pain respectively.

At the follow-up visit after two months we Final outcome was measured after 2 months of follow-up complete recovery was documented such as scar formation, contracture or hypertrophic scar. Outcomes analysis was made on SPSS and T-Test with a significant p-value as (0.05).

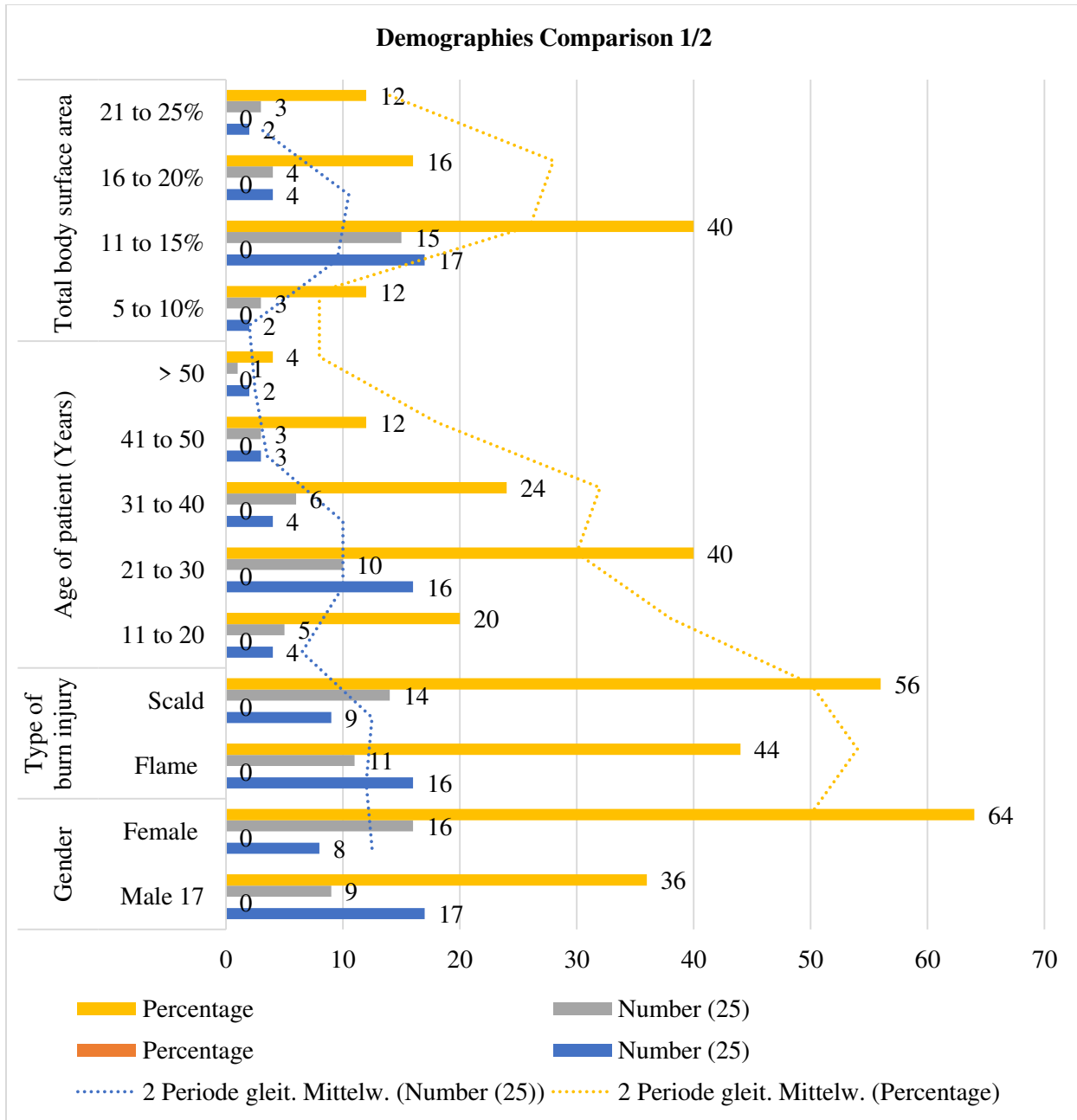
RESULTS:

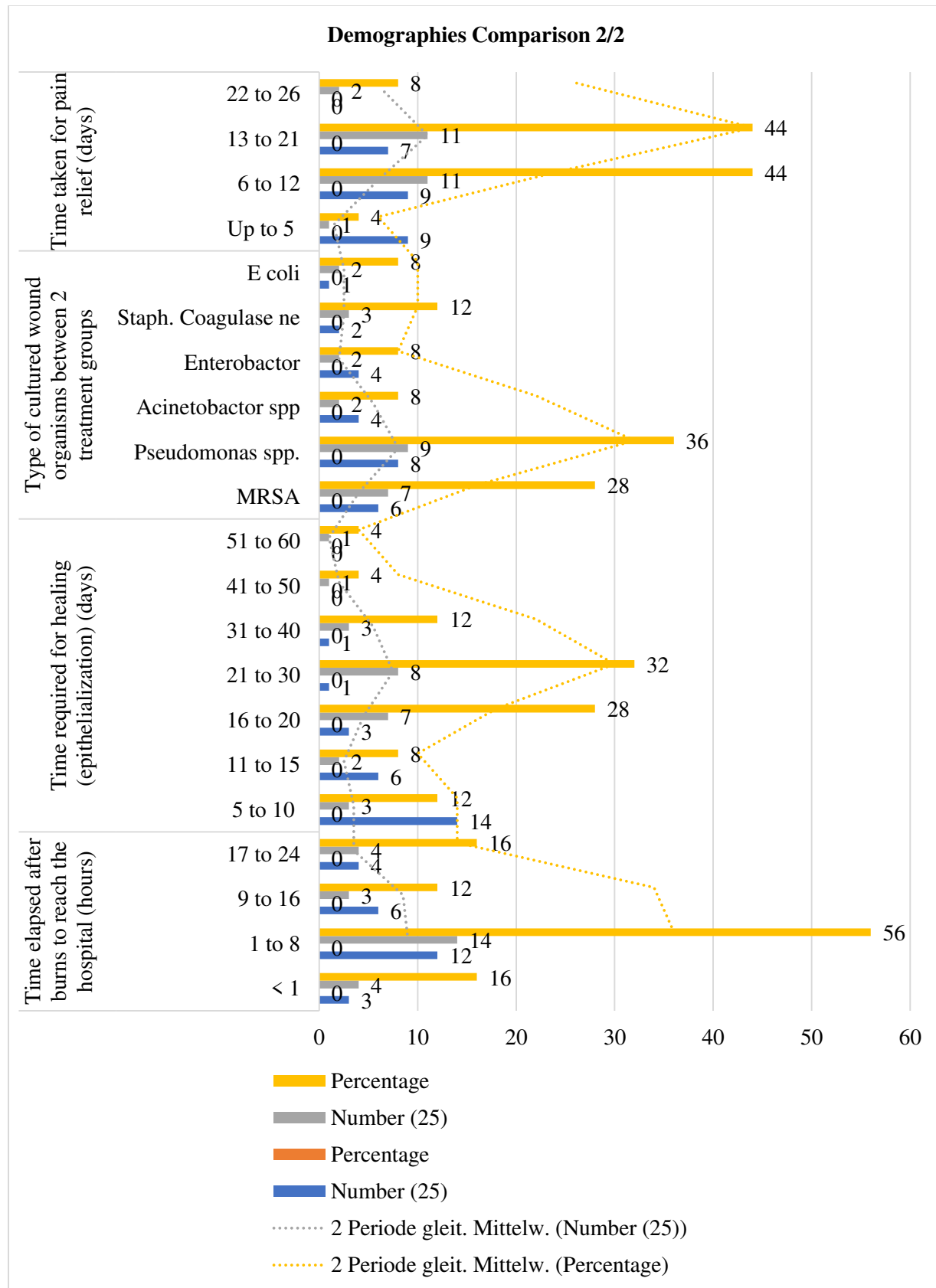
The Aloe Vera gel managed cases the wound healing was rapid than the silver sulfadiazine (1%). An earlier relief of pain was observed in the Aloe Vera group than the SSD group. A detailed outcomes analysis is shown in the given table and figures about every aspect discussed in methods and patients. Male to female proportion was respectively 26 & 24 in the age range of 15 – 65 years. Mean healing duration in Aloe and SSD (1%) group was respectively (114.18) and (24.24, 11.16).

Wound colonization was developed in (76%) cases respectively in Aloe and SSD group as 16 cases (64%) & 22 cases (88%). Significant p-value was taken as (> 0.0). Antibiotic management was extended to infected wound patients.

Table: Demographics of patients in both groups & Comparison of results in both groups

Patient Characteristics		Aloe Vera Group		SSD Group	
		Number (25)	Percentage	Number (25)	Percentage
Gender	Male 17	17	68	9	36
	Female	8	32	16	64
Type of burn injury	Flame	16	64	11	44
	Scald	9	36	14	56
Age of patient (Years)	11 to 20	4	16	5	20
	21 to 30	16	64	10	40
	31 to 40	4	16	6	24
	41 to 50	3	12	3	12
	> 50	2	8	1	4
Total body surface area	5 to 10%	2	8	3	12
	11 to 15%	17	68	15	40
	16 to 20%	4	16	4	16
	21 to 25%	2	8	3	12
Time elapsed after burns to reach the hospital (hours)	< 1	3	12	4	16
	1 to 8	12	48	14	56
	9 to 16	6	24	3	12
	17 to 24	4	16	4	16
Time required for healing (epithelialization) (days)	5 to 10	14	56	3	12
	11 to 15	6	24	2	8
	16 to 20	3	12	7	28
	21 to 30	1	4	8	32
	31 to 40	1	4	3	12
	41 to 50	0	0	1	4
	51 to 60	0	0	1	4
Type of cultured wound organisms between 2 treatment groups	MRSA	6	24	7	28
	Pseudomonas spp.	8	32	9	36
	Acinetobactor spp	4	16	2	8
	Enterobactor	4	16	2	8
	Staph. Coagulase ne	2	8	3	12
	E coli	1	4	2	8
Time taken for pain relief (days)	Up to 5	9	36	1	4
	6 to 12	9	36	11	44
	13 to 21	7	28	11	44
	22 to 26	0	0	2	8





In terms of cost-effectiveness Aloe Vera gel (1000 ml = Rs. 480); whereas, SSD (1%) as (250 grams = Rs. 617). Complete recovery was observed in 24 out of 25 Aloe Vera treated patients; whereas, SSD group 19 out of 25 patients recovered fully remaining six cases presented formation of hypertrophic scar or contractures development.

DISCUSSION:

Ancients used Aloe Vera for the healing and medication purposes [18]. For beatifications it was used by the Egyptian queens Cleopatra and Nefertiti. Soldiers of the great warriors like Christopher and Alexander also used it as wound healing medicine. Later its evidence is found in the English literature [19, 20].

Seventy-five active potent constituents are available in Aloe Vera such as vitamins, choline, folic acid, enzymes, minerals, sugars, lignin, salicylic acids, saponins and amino acids [21 – 23]. Aloe Vera contains salicylic acid which possesses some anti-inflammatory features, lignin has preventive properties for related skin ingredients, saponins is a soap like substance with antiseptic and cleansing properties.

Bio-chemical and Cellular events help in the process of wound repair as glucomannan and gibberellin are respectively mannose-rich polysaccharide and hormone of the growth, that interacts with factor of receptor growth on fibroblast and stimulates proliferation and activity and in a reaction collagen synthesis is increased after oral Aloe Vera and topical [24]. It accelerates the healing and scaring process [25]. There are also reports of the increased hyaluronic acid synthesis and dermatan sulfate in healing of granulation tissue with the topical and oral treatment [26]. There is a combination of antiseptic agents in Aloe Vera total six in number including lupeol, urea nitrogen, salicylic acid, phenols, cinnamomic acid and sulfur with fungi inhibitory features including viruses and bacteria [27].

Our research observed that effective healing was observed in the Aloe group than the SSD group. Thamlikitkul states its effectiveness in the model of animals and clinical investigations including human groups [28, 31 – 34]. Same has been observed by various other authors [28 – 30]. On the contrary in the clinical research it is stated that Aloe can be effective in the severe wounds as well because of its magical wound healing properties [35].

Aloe treated rapidly the partially thick burns than SSD respectively (11, 4.18 days) and (24.24, 11.16 days).

CONCLUSION:

The dressing of Aloe Vera gel on the patients of thermal burns was better the SSD dressing in terms of wound epithelialization, rapid and earlier pain relief and it was also cost-effective.

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