



(RESEARCH ARTICLE)



A retrospective study to assess the effectiveness of bath in burns healing by reducing the Length of Stay in hospital at Apollo Speciality Hospital, Vanagaram

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Abstract

Background: Ours is a dedicated burns unit at Apollo Speciality Hospitals, Vanagaram. This study deals with two mass casualties at Neyveli Lignite Corporation (NLC) and Pharmaceutical company (Pondicherry). This came to initiate the quick recovery of the patient of the hospital stay.

Methods: Retrospective cohort study research design was taken for this study. The study was conducted at Apollo Speciality Hospitals, Vanagaram for a duration of 3 months, 60 samples using simple random sampling who met the inclusion criteria were selected as study samples. Data collection tool such as Socio- Demographic Data (Age in years, Sex, Average Length Of Stay, Scar sites) and clinical variables proforma of cleansing modality, cleansing solution, additives, frequency were used.

Result: Percentage of total body surface area will reflect in Average Length Of Stay. 33 responders were given the bathroom bath was discharged with 11-20 days of hospital stay. 4 responders of bathroom bath were discharged with 21-30 days of hospital stay. In this study the estimation of hospital Length Of Stay was calculated as 1 day per percent total body surface area burn (1 day/%TBSA) by improving the wound healing by giving bathroom bath.

Conclusion: Wound cleansing and dressing is the basic procedure where the wound healing begins.

Keywords: Burns; Burns patient; Bathroom bath; Staff nurses; Average Length of Stay

1. Introduction

Bath therapy is the process of treating the dysfunction with the help of water either by immerse/ submerging method or by shower/ pouring method. Bath therapy or hydrotherapy plays vital role in treating burn wound from 17th century. Even though after so much years of practice, there is no worldwide standardized operating protocol for bath therapy and vast controversies in applying the technique makes it difficult to implement in day-to-day practice. According to ABA, in resuscitative phase, burnt area should be cooled with cool or lukewarm water for at least 20 minutes as soon as possible to reduce the depth of burns and to reduce the pain and inflammation. Many research has been done till date to demonstrate there is proven advantage that would benefit the patient by removing debris, promoting tissue granulation by facilitating new skin bed and improving blood flow to the wound site in early bath in acute/ intermediate phase and first half in rehabilitative phase. The timing and indication for hydrotherapy may vary from patient to patient. Moisturizing the wound site prior to hydrotherapy will help in easy debridement of exudates during bath without much pain. There is dispute among health personnel, that the bath therapy will spread infection from affected site to non-

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affected site and possible growth of opportunistic microorganisms such as *Pseudomonas aeruginosa*, MRSA, MSSA, a ubiquitous bacterium which causes noxious effects on patient's health. But our concern is to apply certain principle in bath therapy such as pre-moisturizing the dry/scaly wound, soaking unhealthy granulation with antiseptic solution, scrubbing the wound with clean gauze using low pH soaps or antimicrobial solutions, pouring/ showering lukewarm water and thoroughly drying the wound with gauze pads that would prevent such kind of deleterious effects and do not cause any significant clinical symptoms such as persistent high grade fever, foul smelling purulent discharge from wound and hemodynamic instability.

2. Review of literature

Jenna Langschmidt and others (2014) conducted the survey, included 28 burn care providers. 27 reported using hydrotherapy. Only 11 (41%) had defined indication criteria with 4 (15%) implementing a specific protocol. So they have considered that hydrotherapy is appropriate standard of infection control.

S. Moufarrij and team (2014) conducted a study on effects of dynamic action of hot spring water as a rehabilitative treatment for burn patients in Switzerland. Out of 31 patients with 40 HPT (Hydro pressure therapy) sessions, encompassing 84 weeks of treatments, have been processed in 2 years duration. None of the patients had any treatment-related complications, infections or treatment interruptions. The assessment of scars was done based on VSS (Vancouver Scar Scale). In the 31 patients, a total of 75 scar sites were analysed before beginning HPT (Hydro pressure therapy) and at 2- 3 weeks post-therapy. Outcome measures for all patients, 44% difference seen before and after HPT on pliability, 52% on vascularity, 50% on pigmentation and 39% on wound height. Overall, there was a reduction with 39 – 52% of VSS measure.

Peter G. Davison and others (2010) conducted a survey on hydrotherapy in North American burn Centre and described the epidemiology of hydrotherapy-associated nosocomial infections. Questions were asked in the aspects of practice, method, additives, disposable liners, decontamination practices, nosocomial pathogens. 44% of burn centre responded in which 83% of them regularly use hydrotherapy. Majority of the burn centre uses shower in hydrotherapy (SCH) when compared with immersion hydrotherapy (IH) and few of them uses combination of IH and SCH. Nearly half of them used Tap water alone and detergent, 16% chlorhexidine, and 7% povidone-iodine. The majority of centres (57%) do not use hydrotherapy, 20% used weekly, 7% monthly, and 17% less than a month. Prevalence of hydrotherapy use at North American burn centres has decreased since 1990 (83% vs 95%). The use of IH has also declined (55% vs 81%). The trend away from the exclusive use of IH will likely continue, because more centres started to use showering methods.

HA Shankowsky and others (1994), conducted a survey to investigate the role of hydrotherapy in the treatment of patients with burns in Canada and the United States. Results of the survey shows (94.8%) burn centres in North America are using hydrotherapy. They used to immerse the patient of about 81.4%. About 82.8% perform hydrotherapy on all patients with burns of total body surface area, and 86.9% continue with hydrotherapy throughout the entire hospital stay. *Pseudomonas aeruginosa* are the most common, major cause of sepsis in 52.9% of the burn units surveyed, *Staphylococcus aureus* are 25.5%, and *Candida albicans* are 5.2%. This survey demonstrates the extensive use of hydrotherapy in North American burn units and the concern for serious infections in patients with burns from gram-negative organisms such as *Pseudomonas* species. There is increase in number of *Pseudomonas* infections in the use of hydrotherapy.

P. D. Thomson and others (1990) conducted a survey on use of hydrotherapy in United State Burn centre. Out of 90 facilities all the facilities, nurses used the immersion therapy procedure.

CR Cardany and others (1985) studied the effects of hydrotherapy alone and hydrotherapy with sodium hypochlorite (NaOCl) on the number of bacteria on the surface of unburned and burned skin. Results shows there is no significant reduction in bacteria. The addition of NaOCl in the hydrotherapy showed a decrease in the number of bacteria on unburned and burned skin. However, treatment with this antiseptic agent in the hydrotherapy showed some side effects to patients, so it was limited in use in burn centre.

Angeras et al. in 1992 demonstrated that the use of tap water instead of sterile saline 0.9 per cent produced no difference in wound infection rates. In a Cochrane database review in 2008, Fernandez and Griffiths reported on 11 randomized and quasi-randomized controlled trials that compared rates of infection and healing with water and saline, as well as no cleansing.

Aims and objective:

- To evaluate the significance of bath therapy in healing burnt wound reducing burn wound infection.
- To investigate the effectiveness of bath in reducing the Length Of Stay in the hospital for the burns patient.

3. Methodology

- **Study place:** Apollo Speciality Hospitals, Vanagaram
- **Study design:** Retrospective cohort study
- **Study duration:** 3 months
- **Study population:** 60

3.1. Inclusion criteria

- Burns patient of 60 burns patients admitted and discharged in Apollo Speciality Hospital from March 2023.
- Patients who had bath therapy during their stay in burns unit
- Patient with TBSA less than 50% for all thickness burns
- Patient with first degree burns or superficial partial thickness burns with more than 50% TBSA
- Hemodynamically stable burns patient shifted from ICU
- Burns patient after tracheostomy closure and removal of invasive lines.
- Burns patient undergone SSG more than 1 week of time after change of dressing
- Burns patient with all wound closed
- Burns patient with open first/ second degree burns in particular body area which needed grafting later
- Burns patient with low grade fever (less than or equal to 100-degree Fahrenheit) with other stable parameters

3.2. Exclusion criteria

- Burns patient admitted directly to ICU
- Patient who got shifted to ICU/ who went DAMA/ discharged at request
- Patient with tracheostomy or other invasive lines
- Hemodynamically unstable burns patient with active infections
- Burns patient who underwent SSG within 1 week of time after change of dressing

METHODS: Self-structured checklist will be used to assess the effectiveness of bath in burns healing by reducing the Average Length Of Stay in Hospital.

Ethical clearance number: AVH-C-S-012/08-23. Permission for the research was obtained from Ethical committee, Apollo Hospitals, No. 21 & 24, Greems Lane, off. Greems road, Chennai.

3.3. Description of the tool:

The investigator will use wound bed preparation regimen to assess the effectiveness of bath in burns wound healing and reducing length of stay in hospital. The data will be gathered by obtaining ALOS data and nurses report note in which samples will be selected based on inclusion criteria. Samples selected will be screened for date of admission, date of initiation of bath, post bath therapy clinical status, post bath therapy grafting and its uptake and date of discharge.

- **Age**
 - Less than 15 years
 - 15- 60 years
 - more 60 years
- **Sex**
 - Male
 - Female
- **Average Hospital Length Of Stay**
 - Less 5 days
 - 5 – 10 days
 - more 10 days
- **Scare sites**
 - Head and neck

- Superficial burns
- Deep burns

Socio-demographic characteristics of burn patients who visited Apollo Speciality hospitals, Vanagaram from Aug 2023, to Nov, 2023

3.4. Frequency distribution of demographic data

Table 1 Frequency and Percentage Distribution of demographic variables

Category	Frequency	Percentage
Age		
less than 15 years	9	15%
15- 60 years	47	78.3%
more than 60 years	4	6.6%
Sex		
Male	32	53.3%
Female	28	46.6%
Average Length Of Stay		
Less than 5 days	3	5%
5 – 10 days	10	16.6%
More than 10 days	47	78.3%

- **Cleaning modality**
 - Immersed in basin/tub
 - Spraying
 - Shower
 - Wiping (bed side)
- **Type of solution**
 - Tap water
 - Sterile water
 - Sterile saline
- **Additives in cleansing solution**
 - Regular soap with neutral PH
 - Other detergent
 - Povidone iodine
 - Chlorhexidine
- **Frequency of cleansing**
 - Daily once
 - Daily twice
 - depending upon the type of topical antibacterial treatment

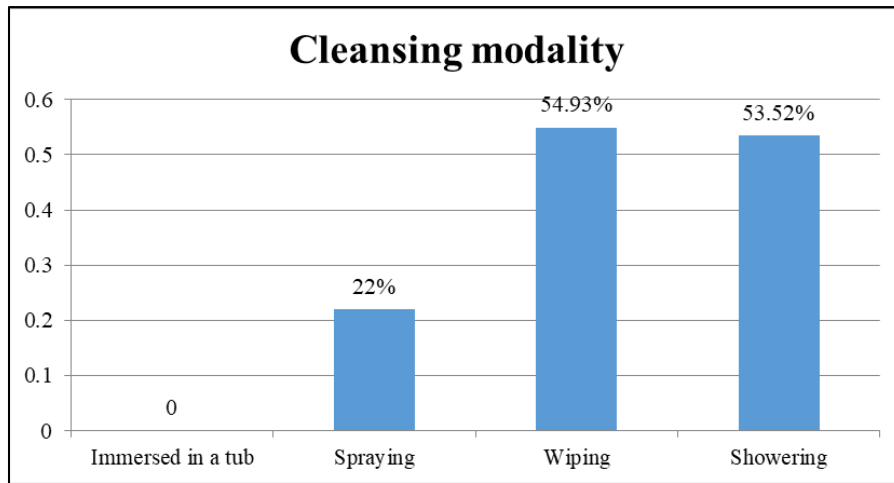


Figure 1 Frequency and percentage distribution of Cleansing modality

The in-patient data, Wiping was still the most commonly used method of wound cleansing (54.93%). None of them used the tub and very few used spraying method, about 22% of our responders used these methods for their patients. Showering was also a common method used (53.52%).

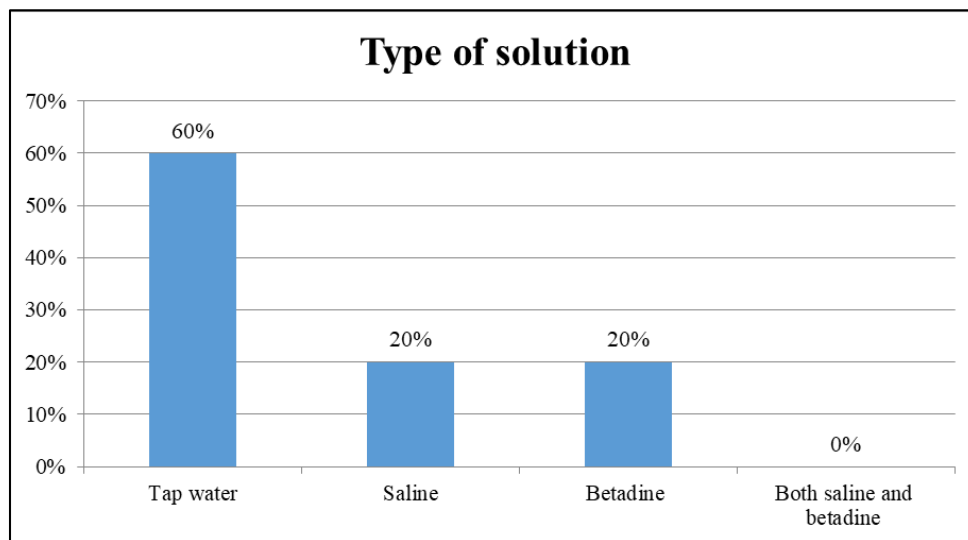


Figure 2 Frequency and percentage distribution of type of solution

None of the responders used combination of saline and betadine as a cleansing solution. Saline and betadine were used equally by the responders (20%). 60% respondents cleansed with tap water.

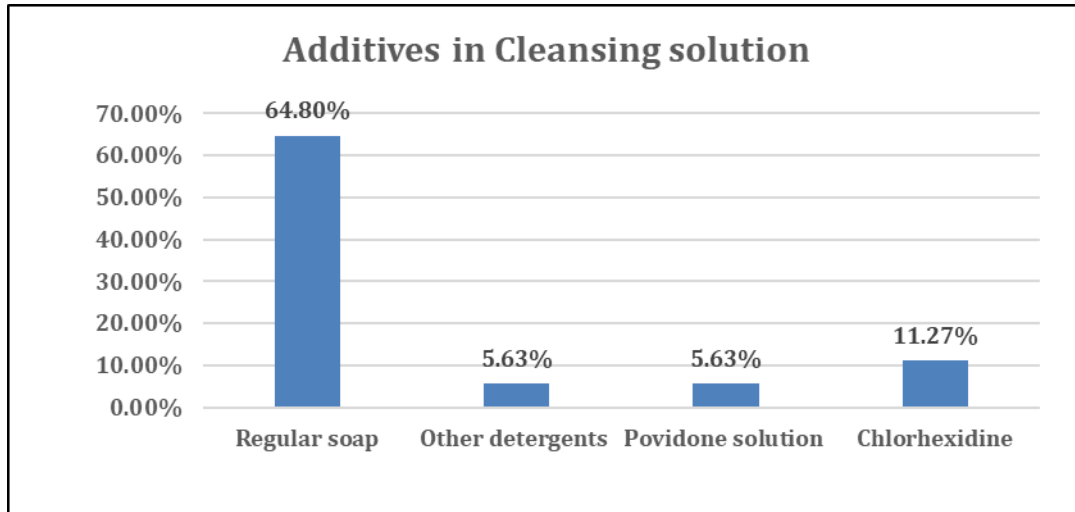


Figure 3 Frequency and percentage distribution of additives in cleansing solution

Soaps with neutral PH were still the most common additives used as a cleansing solution. Usage of povidone iodine and other detergents is 5.63% and chlorhexidine was reported to be used by 11.27%

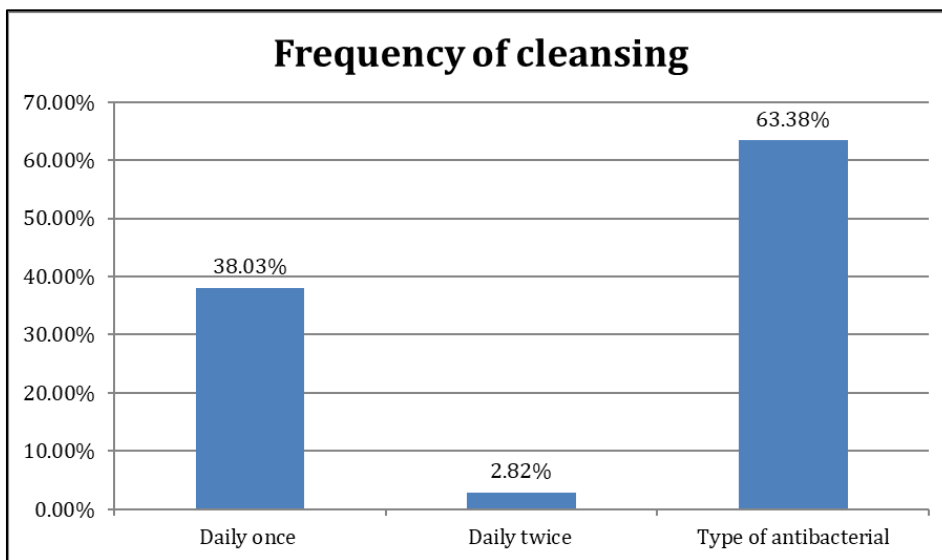


Figure 4 Frequency and percentage distribution of frequency of cleaning

The frequency of cleansing varies depending upon the type of antibacterial treatment (63.38%). Cleansing happens twice a day (2.82%) and daily once (38.03%)

3.5. Percentage of burns

Table 2 Frequency distribution on degree of burns percentage

TBSA	Bathroom Bath	ALOS (Average length of stay)
1 -11%	23	1 - 11 days (38%)
12-31%	33	11- 31 days (55%)
32- 45%	4	21 - 31 days (7%)

Percentage of total body surface area will reflect in Average Length Of Stay. 33 responders were given the bathroom bath was discharged with 1-11 days of hospital stay. 4 responders of bathroom bath were discharged with 11-31 days of hospital stay.

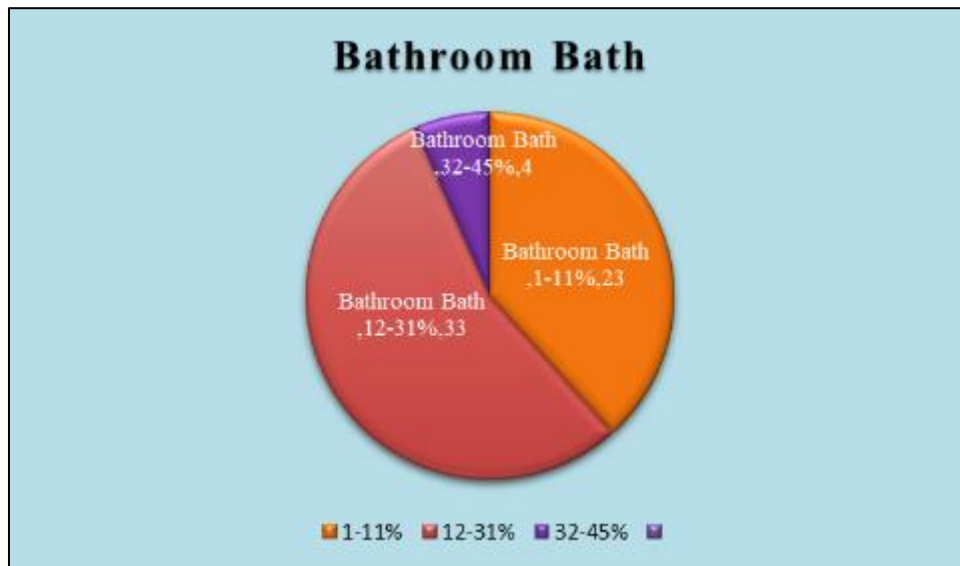


Figure 5 Percentage and frequency distribution of total body surface area and Average Length Of Stay

In this study the estimation of hospital length of stay was calculated as 1 day per percent total body surface area burn (1 day/%TBSA).

4. Discussion

Many viewed wound cleaning was not based on scientific evidence. However, the best wound care on method, solution, and frequency is yet to determined. Using detergents and solutions is harmless in the process of wound healing. Many of the molecules were harmful and affect wound healing when not properly applied.

The in-patient data, Wiping was still the most commonly used method of wound cleansing (54.93%). None of them used the tub and very few used spraying method, about 22% of our responders used these methods for their patients. Showering was also a common method used (53.52%).

None of the responders used combination of saline and betadine as a cleansing solution. Saline and betadine were used equally by the responders (40%). 60% respondents cleansed with tap water.

Soaps with neutral PH were still the most common additives used as a cleansing solution. Usage of povidone iodine and other detergents is 5.63% and chlorhexidine was reported to be used by 11.27%

The frequency of cleansing varies depending upon the type of antibacterial treatment (63.38%). Cleansing happens twice a day (2.82%) and daily once (38.03%).

Despite all these reports and concerns, our survey showed that the wound healing and Average Length Of Stay was 55% (11-31 days) who practiced bathroom bath (Tap water and Neutral PH soap) with the total body surface area was 21-35%. Only four of the responders showed the hospital stay of 7% (21 – 31 days) with TBSA of 36-45%.

Similarly studies like Jenna Langschmidt and others (2014), S. Moufarrij and team (2014), Peter G. Davison and others (2010), HA Shankowsky and others (1994), P. D. Thomson and others (1990), Angeras et al. in 1992 the majority of the centres used tap water for the treatment of their in-patients. Tap water more effective than saline in reducing infection rates in adults with acute wounds. There is statistical significance in wound healing and reduction of hospital stays when wounds were cleaned with tap water.

5. Conclusion

Wound cleaning and dressing is a process that is based on the evidence and not a ritualistic behaviour or a personal preference. Thorough knowledge should be obtained about the effects of the topical agents before using them, whether detergents, antiseptics, or antimicrobials. More clinical studies are needed to confirm or negate the positive or negative effects of any topical solution or dressing recommended to optimize burn wound healing.

Recommendation

The burns wound healing is significantly high and the Average Length Of Stay is less for the patients who were given wash with tap water and neutral PH soap. This study could be elaborated further to be in practice in all other burns units.

Compliance with ethical standard

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