GAVIN PUBLISHERS

Emergency Medicine Investigations

Iqbal T, et al. Emerg Med Inves: EMIG-169.

Review Article

DOI: 10.29011/2475-5605. 000069

Role of Suprathel in Dermal Burns in Children

Tariq Iqbal*, Usman Ali, Zafar Iqbal, Zofishan Jabeen Fatima, Muhammad Rehan, Muhammad Shais Khan

Burn Care Center, Pakistan Institute of Medical Sciences, SZAB, Medical University, Islamabad, Pakistan

***Corresponding author:** Tariq Iqbal, Burn Care Center, Pakistan Institute of Medical Sciences, SZAB, Medical University, Islamabad, Pakistan. Email: driqbal65@gmail.com

Citation: Iqbal T, Ali U, Iqbal Z, Fatima ZJ, Rehan M, et al. (2018) Role of Suprathel in Dermal Burns in Children. Emerg Med Inves: EMIG-169. DOI: 10.29011/2475-5605. 000069

Received Date: 11 December, 2017; **Accepted Date:** 24 January, 2018; **Published Date:** 01 February, 2018

Abstract

The role of Suprathel, a synthetic skin substitute, for superficial and deep dermal burns in children was evaluated. 65 children (25 females, 40 males: mean age 4.9 years, (range 04 months to 11 years) with dermal burns were treated with Suprathel. Flame burns were 14 and 51 were scalds. The burns were superficial dermal (n= 16), mid-dermal (n=34) and deep dermal (n=15); the median %TBSA was 23.6% (range 08-45%). Suprathel was applied after debridement, followed by Vaseline gauze, dry gauze and crepe bandage. The outer dressings were changed every 4-5 days unless clinical problems indicated otherwise. Median healing time was 15 days (range 10-35 days). 20 patients took longer than 21 days to heal, of whom 13 were flame burns and developed hypertrophic scarring, which was strongly associated with wound infection. Healing time of superficial dermal and mid-dermal burns was not significantly different.

Suprathel is an effective skin substitute for the treatment of superficial and deep dermal burns in children. The majority of burns in children are mixed depth, and Suprathel has the advantage that it may also be used to treat deep dermal burns. It behaves like a biological dressing but is not animal derived, so is acceptable to all religious and ethnic groups. Suprathel significantly reduced pain. Its easy handling and patient comfort was superior compared to other materials. The Suprathel membrane adhered rapidly to the wound thus protecting against infections and promoting wound healing. No allergic reactions were observed. The ability of the material to resorb ensured pain-free removal after complete healing of the wound. We observed that the material effectiveness contributes to the reduction of overall treatment costs. Further studies to evaluate the efficacy and cost effectiveness of Suprathel compared to other dressings in children are needed.

Keywords: Deep dermal burns; Suprathel; Synthetic skin substitute

Introduction

Most of the burns in children are partially thick having scalds which are aching, potentially grave and bear a threat of permanent marking and distortion, with linked physical and emotional effects [1]. The level of burn injury is established by the degree of temperature and the time a child is exposed to that heat [2]. Mechanism of sustenance of injury may provide useful guide for the possible severity; taking the example, scalds from fat produce deeper injury as compared to water scalds, this is due to density of the scald. Similarly scalds from immersion are deeper to that of spillover of same type of hot liquid. On the same pattern, children having other co-morbidities, like paraplegia which is secondary to spina bifida, mostly suffer worse injury, this is due to fact that they lack sensation or found unable for extricating themselves from source of heat. There are local factors, like changes in perfusion and inflammatory response which also influence final extent of burn.

Pathophysiology recognize three zones of burn wound; hyperemia, Stasis, and Coagulation [3]. Coagulation zone is one where coagulation in tissue protein has occurred irreversibly, hence, this area is termed unsalvageable. The Stasis zone is characterized through identification of decreased tissue perfusion. Hence, blood flow to such areas is the primary aim of burns management in order to prevent extension of injury. Lastly, Hyperemia zone is one which has increased perfusion; therefore, patient is not on risk otherwise than due to added factors which include infection. Suprathel is a synthetic epithelial substitute [4]. Suprathel economizes the donor sites and also helpful in burns where graft availability is comprised. Suprathel has advantage in children with compromised graft sites providing lower pain and better wound healing.

Methodology

The study was conducted at Burn Care Centre PIMS of SZAB Medical University Islamabad between December 2015 to March 2017. Patients with scalds or flame burn injury reported within six hours of injury were included for this study. Total sample was 65 children of ages between 04 months to 11 years having dermal burns among which 25 were females and 40 were males. Specialist staff carried out the whole treatment and monitored the subjects in order to get a reliable data. After conditioning with general or opiate anesthesia, the burns injuries were washed thoroughly with saline water and antiseptic solutions and wound beds were made clean by removing dead skin and blisters. The injuries were assessed in detail before proceeding further. Flame burns were 14 and 51 were scalds. The burns were superficial dermal (n= 16), mid-dermal (n=34) and deep dermal (n=15); the median %TBSA was 23.6% (range 08-45%). As shown in figure 2& 3 a layer of Suprathel was applied on the wounds succeeded by Vaseline gauze, dry gauze and crepe bandage. The outer dressings were changed every 4-5 days unless clinical problems indicated otherwise. Data about age of patients, % TBSA, depth of burns, type of burns and healing time in days was collected.

Median healing time was 15 days (range 10-35 days). 20 patients took longer than 21 days to heal, of whom 13 were flame burns and developed hypertrophic scarring, which was strongly associated with wound infection. Healing time of superficial dermal and mid-dermal burns was not significantly different. The relation between TBSA and healing time has been shown in Fig. 4. Burns with TBSA less than 30% were healed before median time. The TBSA was positively correlated with healing time in days.

Discussion

In order to treat burns in children, Suprathel is in focus of clinicians as itcontains synthetic copolymer having ε-Caprolactone, Polylactide and Tri methylene carbonate [5]. Literature shows that a number of studies have been conducted to show the different dimensions while treating with Suprathel as absorbable dressing. It has been compared with other similar products and the results vary in a wide range. Dressing with Suprathel has an effect of lesser pain and better ease of care as compared to Omiderm, however the cost of Suprathel is higher than Omiderm [6]. Results of treatment with Suprathel has also been compared with that of Biobrane and it was found that Biobranehealed approximately 1.8 days earlier as compared to Suprathel [7]. In healing of donor site of Split-thickness skin grafts while treating dermal burns, a reduced amount of pain and less blood loss has been observed in treatment with Suprathel in comparison with Mepilex [8].

H.F.Selig, in his study has shown that the scar quality with Suprathel in deep-partial thickness burns is comparable with autologous split thickness graft after 30 and 90 days postoperative scar evaluation [9,10]. These results were evaluated according to Vancouver Scar Scale (VSS) and Patient and Observer Scar Assessment Scale (POSAS). As compared to Jelonet, Suprathel provides reduction in frequent dressings [11]. Uhlig in a study showed about 90% complete epithelization of second degree hand burns with the use of Suprathel. This has avoided skin grafting producing comparable results with graft [12].

A study on children with mixed thickness burns conducted in UK had median healing time of 16 (range 9 to 38 days) days with Suprathel use, similar to our study with median healing time of 15 days [13]. The epithelialization time in partial thickness burns was 14 days when Suprathel was used in first 24 hours of injury, in a study from Poland [14]. These results are also similar to our study showing effectiveness of Suprathel. In another study median epithelialization time came out 13 days (range 7 to 29 days) [15].

The above discussion shows both the clinical as well as academic importance of Suprathel. These days, biological dressings are considered as the most suitable treatment modalities to manage mid and deep dermal burns among children specifically when a comparison is made with comparative dressings. It has been established that Suprathel is working in similar manner as the biological dressings despite the fact that it is not xenogenicin origin. It is, however, known that Suprathel is costlier as compared to the biological dressings but ultimately it is cost effective as there is only one session of dressing required under anesthesia or sedation and only 2-3 sessions of superficial change of dressing without anesthesia in majority of cases. Moreover, the result of the current study and similar studies discussed above has shown that Suprathel can heal mid dermal burns in children. Since the mainstream burns in children are mainly in diverse depth, the suggestions for Suprathel can be extended besides biological dressings which are not usually suggested for application in burns of mid-dermal depth. The outcome of this study encourages a methodical examination to appraise the effectiveness and price efficiency of Suprathelin comparison with other medicin esutilized for mid dermal and deep dermal burns particularly in children.

Conclusion

Suprathel is a useful skin alternate for the dealing with deep dermal and mid dermal burns in children. The mainstream burns in children are of diverse depth, and Suprathel has the benefit that it may also be used to treat deep dermal burns. It performs similar to a biological dressing despite the fact that it is not a derivative of animal, so is suitable to all patients having any religion or ethnicity. Suprathel has brought considerable decline in pain. It firmly adheres to the burn wounds and acts as barrier against microorganism's invasion. This is the ability of Suprathel to surpass its competitors. Moreover, it can be easily managed and the comfort extended to patient is comparatively much better than all similar dressings.

References

1. Kemp AM, Jones S, Lawson Z, Maguire S (2014) Patterns of burns and scalds in children. Archives of disease in childhood 99: 316-321.
2. Gandhi M, Thomson C, Lord D, Enoch S (2010) Management of pain in children with burns. Int J Pediatr 1-9.
3. Vivó C, Galeiras R, Caz MD (2016) Initial evaluation and management of the critical burn patient. MedicinaIntensiva 40: 49-59.
4. Behr B, Megerle KO, Germann G, Kloeters O (2008) New concepts in local burn wound therapy.Organ der V 40: 361-366.
5. Uhlig C, Rapp M, Hartmann B, Hierlemann H, Planck H, et al. (2007) Suprathel®-An innovative, resorbable skin substitute for the treatment of burn victims. Burns 33: 221-229.
6. Schwarze H, Küntscher M, Uhlig C, Hierlemann H, Prantl L, et al. (2008) Suprathel, a new skin substitute, in the management of partial-thickness burn wounds: results of a clinical study. Annals of plastic surgery 60: 181-185.
7. Rahmanian SA, Beiderwieden A, Willkomm LM, Amr A, Schaller HE, et al. (2011) A clinical evaluation of Biobrane® and Suprathel® in acute burns and reconstructive surgery. Burns 37: 1343-1348.
8. Kaartinen IS, Kuokkanen HO (2011) Suprathel® causes less bleeding and scarring than Mepilex® Transfer in the treatment of donor sites of split-thickness skin grafts. Journal of plastic surgery and hand surgery 45: 200-203.
9. Selig HF (2011) O28.3 Suprathel versus autologous split-thickness skin in deep-partial-thickness burns. Burns 37: S19.
10. Keck M, Selig HF, Lumenta DB, Kamolz LP, Mittlböck M, et al. (2012) The use of Suprathel® in deep dermal burns: first results of a prospective study. Burns 38: 388-395
11. Schwarze H, Küntscher M, Uhlig C, Hierlemann H, Prantl L, et al. (2007) Suprathel®, a new skin substitute, in the management of donor sites of split-thickness skin grafts: Results of a clinical study. Burns 33: 850-854.
12. Uhlig C, Rapp M, Dittel KK (2007) New strategies for the treatment of thermally injured hands with regard to the epithelial substitute Suprathel. Organ der V 39: 314-319.
13. Highton L, Wallace C, Shah M (2013) Use of Suprathel® for partial thickness burns in children. Burns 39: 136-141.
14. Mądry R, Strużyna J, Stachura KA, Drozdz Ł, Bugaj M (2011) Effectiveness of Suprathel® application in partial thickness burns, frostbites and Lyell syndrome treatment. Polish Journal of Surgery 83: 541-548.
15. Rashaan ZM, Krijnen P, Allema JH, Vloemans AF, Schipper IB, et al. (2016) Usability and effectiveness of Suprathel® in partial thickness burns in children. European Journal of Trauma and Emergency Surgery 18: 1-8.