Treatment of burn with haemoglobin spray as adjunctive therapy to standard care.

 Aim: Burns affect the integrity of the skin and can ultimately result in skin scarring. Current therapeutic goals of wound treatment focus on the reduction of scar formation and severity. However, scar formation varies from patient to patient and within an individual based on the location of the wound. Therefore, the preparation of customized treatments for individual patients represents an important therapeutic goal in the fields of burns and wound healing. The objective of this study was to evaluate the usefulness of haemoglobin spray in the treatment of burns and its impact on scar formation.

 RESULTS & DISCUSSION

 Case 1

 A 65-year-old female patient with a large burn wound (1.1 to 3.2 cm²) at the anterior axillary line. A thick layer of the burn wound was excised and haemoglobin spray was applied on a daily basis. A thin layer of haemoglobin spray was applied on the wound area, fixed with gauze. The wound was treated until the patient was discharged after 15 days. The patient was very satisfied with the result.

 Results: Burn wounds from fourteen different patients were evaluated and treatment results are highlighted. The wound severities range from Grade 1 to Grade 2B. In particular, for grade 2 wounds the scar formation was an important aspect of the evaluation. In all cases, we observed a fast healing of the wounds with a median of 9 days. In addition, skin integrity and scar formation were improved. Nearly 100% epithelisation was observed after a median of 3-4 changes of bandages combined with the application of the haemoglobin spray.

 Case 2

 A 65-year-old male patient with a burn wound on the right hand. The burn wound was excised and haemoglobin spray was applied on a daily basis. A thin layer of haemoglobin spray was applied on the wound area, fixed with gauze. The wound was treated until the patient was discharged after 15 days. The patient was very satisfied with the result.

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 DISCUSSION & CONCLUSION

 Conclusions: Haemoglobin spray might be an adjunctive therapy option for severe burns (2A & B) to accelerate wound healing and to prevent excessive scar formation.

 Table 1: Summary of the fourteen evaluated case reports of burn wounds treated with the haemoglobin spray as adjunctive therapy.

<table>
<thead>
<tr>
<th>Case</th>
<th>Wound at A: Start before cleansing,</th>
<th>Wound at B: after blister removal,</th>
<th>Wound at C: after haemoglobin spray application,</th>
<th>Wound at D: day 17, F: end of treatment (Day 10)</th>
</tr>
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<td>Wound at C: after haemoglobin spray application,</td>
<td>Wound at D: day 17, F: end of treatment (Day 10)</td>
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Fig. 1: Wound treatment: Burn wounds were mechanically debrided or cleansed. After rinsing with an antimicrobial solution, a thin layer of haemoglobin spray was applied onto the wound area. Non-adhesive hydrofoam soaks served as wound dressing, fixed with gauze.

Results: Burn wounds from fourteen different patients were evaluated and treatment results are highlighted. The wound severities range from Grade 1 to Grade 2B. In particular, for grade 2 wounds the scar formation was an important aspect of the evaluation. In all cases, we observed a fast healing of the wounds with a median of 9 days. In addition, skin integrity and scar formation were improved. Nearly 100% epithelisation was observed after a median of 3-4 changes of bandages combined with the application of the haemoglobin spray.

Conclusion: Haemoglobin spray might be an adjunctive therapy option for severe burns (2A & B) to accelerate wound healing and to prevent excessive scar formation.

Case 8: Wound at A: Start before cleansing, B: after haemoglobin spray application, C: after 8 days, D: end of treatment (Day 28).

REFERENCES


DISCUSSION & CONCLUSION

Toxelability: In all cases, the haemoglobin spray was well tolerated and no adverse effects were reported.

Wound healing: In all cases with wound healing disturbance a change of treatment with adjunctive haemoglobin application and non-occlusive dressing resulted in a stimulation of wound healing with a fast wound epithelialisation, without perceptible scar formation. This was achieved with a median of 3-4 applications of haemoglobin combined with hydrofoam dressing. The median duration of treatment was 10 days. Even wounds with a healing disturbance responded in a similar manner after appropriate debridement and cleansing. This observation is remarkable, as 50% of the analysed cases were treated with flumazine ointment as standard care for at least one week without a significant improvement in wound epithelialisation.

Scar formation: All cases with healing disturbances showed a complete epithelialisation without significant scar formation by changing the treatment to haemoglobin spray and a non-occlusive hydrofoam dressing. The other cases treated according revealed a similar result without visible scars. According to the wound experts the skin significantly better than expected.

Time to heal: In the literature it is described that time to heal for small wounds (less than 15% of body surface) treated with flumazine ointment is at 12-14 days. In comparison, the median of wound healing for the 14 cases is 10 days. The median value is 14 days. Including only cases without any healing disturbance in the analysis, the median is reduced to 7 days and the mean value to 8 days. In addition, wound managers stated that the epithelialisation started much faster than with the flumazine ointment treatment. Due to the small number of cases included in this evaluation and lack of control group, further studies are desirable to further evidence the beneficial effect of haemoglobin spray on wound healing of burn wounds.

Conclusion: Haemoglobin spray might be an adjunctive therapy option for severe burns (2A & B) to accelerate wound healing and to prevent excessive scar formation.