TREATMENT WITH BURNSHIELD IN PATIENTS WITH CUTANEOUS BURNS. DEFINITIVE DATA

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SUMMARY. The results are presented of a study of burn patients involving the use of Burnshield for cutaneous burns of varying degree caused by a number of agents. Our original aim was to look for useful materials in order to counteract pain in burn patients. The study has now also come to include the incidence of late complications (keloids and hypertrophic scars). Therapy with successive medication with Burnshield has been reported in experimental studies by Jandera and Arturson. The mean percentage of burned skin in our patients was 3.7% (range, 1-9%). All the patients were examined monthly and treated with Sameplast and/or Siloskin, depending whether the re-epithelialization zone post-burn sill presented areas of granulation tissue in an active phase. Of the 18 patients included in the study, eight received therapy with Sameplast (one also with Siloskin). Therapy in these cases was initiated after re-epithelialization reduced the incidence of late complications to 44.4% (8 patients out of 18). The results of the follow-up after re-epithelialization showed an overall incidence of late complications in only 22.2% of cases.

Introduction
Many agents have been used over the centuries in treatment. Cold water was tried in 1799 by Earle, while in even more remote times silver was an agent frequently used in the topical treatment of burns, a practice recently reintroduced by Moyer. It has been stated that a 0.5% silver nitrate solution is the lowest useful concentration of antibacterial activity against Staphylococcus aureus and Pseudomonas aeruginosa. More recent developments in the use of silver have involved the use of silver sulphadiazine and a combination of silver sulphadiazine with cerium nitrate. It is confirmed in a recent publication that silver sulphadiazine continues to be the remedy for topical use most widely used in America burns centres. The materials used in the treatment of burns range from conventional dressings (paraffin gauzes or silicone polymer, MEBO, etc.) to synthetic medications (imperméable adhesive film, creams and sprays, hydrocolloids, hydrogel, gels and superabsorbents, etc.) and biological dressings (allografts, xenograft skin, collagen, etc.) The long-term results of the re-epithelialization of the lesions are comparable. Patients with extensive burns present a reduction in cell-mediated immunity activity. Most of the methods used in burn treatment have been directed above all at the prevention of infection, and only a few at direct care of the burn. Some experimental research recently conducted on skin burns of varying degree and percentage defines a burn as a state of dehydration. As indirect confirmation of this, repeated “cooling” of the burn with a water-imbuend gauze or other means (hydrogel) reduces the surface temperature and the state of dehydration of the burn zone, with a diminution of pain and of damage due to perilesional vasodilatation. The best way to deal with the burn itself and the great problem of infection would appear to be to find a correct compromise between hydration...
and antisepsis. Burmshield (hydrogel) is composed of water (96%) and melaleuca (1.03%); it promotes hydration in the burn zone, while at the same time this essential oil of the tea tree prevents the infection from having any bacteriostatic action.  

Our original aim was to find useful materials in fight against pain in burn patients, and our results were good. Now, at some distance of time (mean follow-up, 15.2 months; range, 14-18 months), we report on the incidence of late complications (keloids and hypertrophic scars) in our study. In order to compare the findings of our research, it would be useful to conduct a programme of multi-centre studies, with a number of cases involving at the same time first-aid structures, the 118 emergency service telephone number, and burns centres.

**Materials and methods**

Between July 2000 and January 2001, we treated 20 patients with Burnshield for cutaneous burns of varying degree (1st-3rd degree) due to a variety of causal agents (physical and chemical). Eighteen patients with burns in more than 50% of the body surface area (BSA) were eventually included in the study – one was discarded owing to intolerance to Burnshield and one was transferred to another burns centre. The mean age of the patients was 35.4 yr (range, 1-79yr). Three patients were male and 15 were female. The mean percentage of burned skin was 3.7% (range, 1-9%). Table I presents the number of patients in relation to the degree of burn.

**Table I – Degree of burn in relation to number of patients**

<table>
<thead>
<tr>
<th>Degree of burn</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>2</td>
</tr>
<tr>
<td>1st-2nd</td>
<td>2</td>
</tr>
<tr>
<td>2nd</td>
<td>8</td>
</tr>
<tr>
<td>2nd-3rd</td>
<td>4</td>
</tr>
<tr>
<td>3rd</td>
<td>2</td>
</tr>
</tbody>
</table>

Relation to the degree the degree of burn. Table II shows the number of patients in relation to the percentage of burned body surface area. Table III gives the number of patients in relation to the chemical and physical agents that caused the burn.

**Table II – Percentage body surface area burned in relation to number of patients**

<table>
<thead>
<tr>
<th>Percentage burned BSA</th>
<th>Number of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
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<tr>
<td>5</td>
<td>1</td>
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<tr>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
</tr>
</tbody>
</table>

**Table III – Burn agents in relation to number of patients**

<table>
<thead>
<tr>
<th>Physical agents</th>
<th>Chemical agents</th>
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</thead>
<tbody>
<tr>
<td>15</td>
<td>3</td>
</tr>
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</table>

The body area burned was the upper or lower limbs in 14 out of the 18 patients (77.7%), the limbs and abdomen in two patients (11.1%), the chest in one patient (5.5%), and the face in one patients (5.5%). All patients in the study received repeated medications with Burnshield every 12 h to 2 days, depending on the degree and extent of the burn. The lesions were first cooled and cleansed with physiological solution at room temperature (23 °C) and reated surgically within 24 h if necrosis was present. The burn was treated repeatedly with the hydrogel, the entire area being sealed with an impermeable film until complete re-epithelialization. We performed either fibrinectomy or dabbing procedures with silver nitrate in the event of the appearance respectively of abundant fibrin or of exuberant granulation tissue during the damage repair phase.
When re-epithelialization was complete, the patients were examined monthly for the possible appearance of hypertrophic scars or keloids. If these complications occurred, the patients received repeated therapy with Sameplast and/or silicone sheets (Siloskin).

**Results**

Eighteen patients were included in the study. One patient with second-degree burns in 6% BSA (abdomen and chest) and treated until re-epithelialization with conventional medications (paraffin gauze) was excluded because of intolerance to Burnshield after the second medication. Another patient, with second/third-degree burns in over 50% BSA (chest, abdomen, and lower limbs), was sent to nearest burns centre after receiving immediate treatment and after being stabilized (hydration, analgesia, intubation, Burnshield, etc.). The patient sent to the burns centre died after two months as a result of respiratory complications. During re-epithelialization, we recorded the complication of abundant production of fibrin and exuberant granulation tissue, which necessitated respectively treatment with repeated fibrinectomy in one patient (two applications) and dabbing with silver nitrate in another patients (two applications). Maceration in perilesional skin was the most frequent complication in these patients (55.5% of cases); this required temporary suspension of treatment but did not prevent continuation of therapy with repeated medications of Burnshield. Antibiotic therapy was conducted in two patients only. The percentage of late post-burn complications (hypertrophic scars and keloids) reported in the literature is very high (70-80%). The mean follow-up in our 18 patients was 15.2 months (range, 14-18 months). Our study produced a percentage of hypertrophic scars and keloids in 44.4% of the cases (8 patients out of 18) after re-epithelialization, after use of Burnshield only. The same eight patients with complications after re-epithelialization were given Sameplast therapy (one patients also with Siloskin), with treatment beginning after re-epithelialization and continuing on average for 4.1 months (range, 1-14 months). The results of the follow-up show an overall late complication rate of 22.2% (4 patients out of 18).

**Discussion**

We present some selected data in the literature regarding burns in patients in industrial and rural areas in order to have a better understanding of the distribution and frequency of this pathology. The relationship between temperature and the duration of application of the burn agent has been studied: exposure of skin to water at a temperature of 55 °C causes damage after 30 sec, at a temperature of 60 °C after 5 sec, and at 65 °C after only 1 sec. Burns represent approximately 1% of the pathologies seen in emergency departments and some 10% of these patients need hospitalization. The results of an investigation in an urban area indicated that industrial burns were the cause of 10-45% of all burn lesions, with a predominance of certain variables, such as the male sex, young age, the upper limbs, and chemical substances. The majority (70%) of these burn patients had lesions in 1% BSA: the burns were 1-5% BSA in 21% of the patients, 5-15% BSA in 6%, and more than 15% Bsa in 1.5%. Comparative research conducted in patients burned in rural and in urban areas indicated greater extent, depth, and incidence of lesions in rural conditions than in towns.
form of surgery (split, amputation, flap, escharectomy, etc.)

The literature confirms that most burns affect only a small percentage of skin area. For this reason, in our experience, such patients receive adequate and complete treatment in first aid. Our study presents good results as regards late complications, considering that the results refer to patients with burns in a mean BSA of 3.7%. More serious patients (i.e. those in burns centres) have different and more severe complications compared with patients treated in first aid, and for this reason, in our view, they are hardly comparable.

Conclusion

In the treatment of burn patients is to be improved, we must have closer collaboration between first-aid physicians, the emergency 118 telephone number service, and burns centres. In our view, it should be up to burns centres to provide continuous and updated training for the first-aid and 118 emergency service personnel, who are the first to come to the aid of burn victims. It is very probable that the earlier and the more appropriate the treatment of burn patients, the more reduced is the relative risk to survival (acute respiratory failure, acute respiratory distress syndrome, etc.) and perhaps also to late complications (keloids, hypertrophic scars, etc.). It would be useful to perform a multi-centre study with an adequate number of cases equally involving burns centres, first-aid stations, and the 118 emergency service, with the aim of finding some answers to our research.

RESUME

Les Auters presentment les resultants d’une etude sur les patients brûlés qui considérant l’emploi de Burnshield dans les brûlures cutanées de divers degrè dues à plusieurs causes. Leur but à l’origine était la recherche des matériaux utiles pour combattre la douleur dans les patients brûlés. L’étude a inclus ensuite aussi l’incidence des complications tardives (chêloïdes et cicatrices hypertrophiques). La thérapie avec des médications successives de Burnshield a été décrite dans les études expérimentales de Jandera et Arturson. Le pourcentage moyen de la peau brûlée dans nos patients était 3,7% (variation, 1-9%). Tous les patients ont été examinés mensuellement et traités avec Sameplast et/ou Siloskin, selon si la zone de la réépithélialisation après la brûlure présentait encore des aires de tissu de granulation en phase active. Sur les 18 patients inclus dans cette étude, huit ont reçu la thérapie avec Sameplast (un patient aussi avec Siloskin). La thérapie dans ces cas a commencé après la réépithélialisation et a continué en moyenne pour 4,1 mois (variation, 1-14 mois). L’emploi seulement de Burnshield jusqu’à la réépithélialisation a réduit l’incidence des complications tardives jusqu’à 44,4% (huit patients sur 18). Les résultats des études effectuées après la réépithélialisation présentent une incidence globale des complications tardives dans seulement 22,2% des cas.

BIBLIOGRAPHY


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