MATERIAL AND METHODS
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The present study has been conducted at M.L.B. Medical College, Jhansi, from June 1989 to June 1990. Two groups of patients with superficial burns and deep burns were included in the study, which were sub-divided into three sub-groups matched by age and percentage of burn. One sub-group was treated with a combination of Povidone Iodine lotion + Neosporin powder (PVP + N) and the other two by Amniotic membrane and Silver sulfadiazine (SSD).

Neosporin Powder (Wellcome & Burrough) - It is available in powder form, 10 gm pack, are available in the market. This powder contains the following three ingredients.


Neosporin powder is sprinkled over burn area till a uniform coating of powder is obtained.
Betadine Lotion :- is available in 10% Povidone-Iodine form providing 1% available iodine.

Silver Sulphadiazine Ointment - This is available as 1% ointment in ready-made jars of 500 gm and tubes of different quantities. This ointment was applied by uniform layering of burn area and then covering of burn area by sterile dressings.

Method of study -

The selected cases were subjected to detailed history and physical examination which were recorded on following lines -

History Introduction - Name, age, sex, occupation, rural/urban, address, date of admission, date of discharge and time of healing.

Regarding the burn accident -

- Date and time of burn (duration of burn),
- Place of accident and nature of work at the time of accident,
- Cause of burn,
- Prior treatment (if any),
- Symptoms.

Physical Examination :

General Examination - The case was examined for general condition, pulse, B.P.*, temperature, respiration, hydration.
Local Examination -

(a) Percentage of Burn - It was calculated by 'Wallace's rule of nine', in the adult, and by Lund & Brown chart in children.

(b) Depth of Burn - Superficial / Deep.

Estimation of depth of burn -

The hypodermic needle was used to test the pain sensation. The area with increased sensibility was considered to be superficial or partial thickness burn. The area with markedly reduced or absent pain sensibility was considered to be deep or full thickness burn. This was also confirmed by pulling out a hair from burn surface. In the 3rd degree or deep burn, hair pulls out easily and painlessly. The latter test is of value in borderline cases of second degree burn. In addition, help of the following criteria was also sought.

<table>
<thead>
<tr>
<th>Classification of depth</th>
<th>Appearance of Burn area</th>
<th>Pain sensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I degree</td>
<td>Erythematous</td>
<td>Painful and hyperaesthetic.</td>
</tr>
<tr>
<td>II degree:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(A)</td>
<td>Blisters with reddened base and moisture.</td>
<td>Painful and hyperaesthetic.</td>
</tr>
<tr>
<td>(B)</td>
<td>Blisters with blanched base and moisture.</td>
<td>Painful hyperaesthetic or anaesthetic at places.</td>
</tr>
<tr>
<td>III degree</td>
<td>Leathery pale or pearly white or charred dry.</td>
<td>Painless and anaesthetic.</td>
</tr>
</tbody>
</table>

The I & II(A) were included as superficial and II(B) & III were considered as deep burn.
(c) Contamination of wound:

Apparently clean - No contamination of foreign body, clean intact blisters.

Mild contamination - Slight contamination, ruptured blisters, open wound,

Gross contamination - Heavy contamination with dirty cloth, foreign body, dust and/or non-medical substances i.e. cow-dung, mud etc.

(d) Area involved - Diagramatic representation in anterior posterior and lateral view (shown in attached proforma) was done.

Resuscitation and General Management :-

The patients were resuscitated prior to application of Betadine with Neosporin powder or Silver sulphadiazine ointment by I/V fluid, blood, analgesic antibiotic and tetanus prophylaxis, according to the need of patients.

Local Management of wound :-

Preparation of burn surface - A swab from burn surface was taken for culture sensitivity test. Patient was given necessary sedation. A gentle but thorough debridement of wound was done by removing necrosed skin and blisters. The area was again tested for degree of burn. Then the
wound was cleaned with 0.5% Savlon solution twice followed by sterile normal saline thoroughly.

Application of PVP + Neomycin powder in superficial burn:

The application was started by cleaning with saline or Savlon then sprinkling a uniform layer of Neomycin powder on burn surface. Over this the solution of PVP with 1% available Iodine was sprayed uniformly, thus completely soaking the powder. A further layer of powder was applied to form a crust. On the first day, three such applications were carried out without removing the previously applied layers. On the second day, the application was reduced to two and from the third day onwards, this application was limited to those areas from which the crust was either separated or cracked. Subsequently, those areas showing discharge with infection were subjected to twice daily applications each time after removal.

Method of sub-Escharal Injections (Escharolysis) of Betadine Lotion in deep burn patients:

In patients with deep burns, the PVP solution (1% available iodine) was diluted with three equal volumes of normal saline and was injected at multiple sites in the subescharal plain as a 0.25% solution. Each injection prick received 0.5 ml of this solution. This injection was started on the third post-burn day and repeated twice weekly until escharolysis was completed. The injections
amounts to about 0.5 ml per square inch of burn surface every time. In patients with more than 50% deep burns, injection was restricted to three injections at 72 hours. 7th day and 14th day, basically to limit the amount of PVP injected. SSD was applied as for superficial burns.

**S.S.D. Application** -

Dressing soaked in 1% S.S.D. ointment were applied over burn area by the closed method and covered by gauze piece and cotton of sufficient thickness to absorb all exudation without penetration to the surface. Dressing was changed daily.

**Application of Amniotic membrane** -

Fresh or preserved amniotic membrane were taken. The membrane with bad odour and colour changes were discarded. It was stretched open and then applied over burn area about one inch beyond the margins. The temperature of membrane was not considered. The air bubbles between membrane and wound area were removed. The patients were instructed not to move the pack until the membrane became adherent and relatively dry. It was left as such without any dressing except in children and un-cooperative patients where the dressing was applied to retain the membrane.

**Assessment of the case** -

The assessment of the result was done by interview with the patients, examination visits and investigations.
Interviews - The patient was asked about -

1. Pain and discomfort (mild, moderate or severe),
2. Fever,
3. Any evidence of allergy as "Itching, rash, nausea & vomiting.

Local Examination -

Observation for the following was done -

1. Presence of discharge and/or soakage,
2. Appearance of burn area covered by Betadine, Neosporin powder, SSD and Amniotic membrane,
3. Collection of pus under dressing. If the pus was localized, it was cleaned and thoroughly washed. Fresh application of dressing was done. A pus swab was taken for culture and sensitivity test.
4. Formation of crust,
5. Formation of healthy granulation tissue,
6. Appearance and duration of eschar,
7. Assessment of epithelization and healing of wound.
WORKING PROFORMA

Name :
Age :
Sex :
Address :
Date of burn :
Date of primary treatment :
Date & time of admission (Interval between burn and admission)
Percentage of burn -
   Superficial :
   Deep :
Nature of burn :
Method of sustaining :
Primary treatment given prior to admission :

Lat.  Ant.  Post.
Clinical Examination -

- Pulse rate (P.R.) :
- Blood Pressure (B.P.) :
- Respiratory rate :
- Temperature :
- Urine output since burn :
- Infection :
- Eschar :
- Type of burn -
  - Superficial :
  - Deep (Eschar) :

Treatment given

Fluids :

Antibiotics systemic :

Ryles tube aspiration (RTA):

Catheterization :
### Topical Microbicideal

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Povidone + PVP</td>
<td>Silver</td>
<td>Amniotic</td>
</tr>
<tr>
<td>Iodine</td>
<td>Sulphadiazine</td>
<td>membrane</td>
</tr>
<tr>
<td>Neosporin</td>
<td>(SSD)</td>
<td></td>
</tr>
<tr>
<td>Super-</td>
<td>Sub-</td>
<td></td>
</tr>
<tr>
<td>ficial escharal</td>
<td>(PVP+N)</td>
<td>(PVP)</td>
</tr>
</tbody>
</table>

**No. of applications**

1st day

2nd day

after 48 hours

**Evaluation**

Urine output/24 hrs.

Infection -
  - Local
  - Toxaemia/Septicaemia

**Eschar separation**:
  - Started (days)
  - Completion (Separation)

**Surface culture and sensitivity report**

**Qualitative**
  - Pre-treatment
  - 48 hours
  - 7 days
  - After eschar separation

**Quantitative**
  - 48 hours
  - 7 days

**Time of complete healing (days)**
  - With grafting
  - Without grafting

**Mortality**
Photograph – A

Showing materials as Betadine lotion, Savlon, Lotion spray machine, and Neosporin powder in a tray.

Photograph – B

Showing materials for subescharal injections of diluted Betadine with syringe (20 ml.) & Needle (No. 18, 1 1/2 inch length).