

EXPERIENCE WITH USE OF 1% SOFRAMYCIN SKIN CREAM IN MANAGEMENT OF BURN WOUND

C. P. SAWHNEY AND R. K. SHARMA

SUMMARY

The use of 1% Soframycin skin cream (framycetin) in the management of burn wounds was found to be superior to nitrofurazone ointment in a trial conducted on fortyfive cases of burns. It was found helpful in reducing burn wound sepsis, invasive sepsis and ensured early healing. It also helped in reducing morbidity of the patients.

(Key Words: Burns, Infection, Antibiotics)

Burn wound is an excellent medium for the surface bacterial growth and invasive wound sepsis because it is covered with dead, necrotic or partially devitalized tissue with overall low host resistance. The prophylactic or therapeutic use of the systemic antibiotics either singly or in combination has been found to be ineffective to control burn wound surface infection as well as invasive sepsis (Moncrief, 1958 and Order, 1965). The use of suitable topical antimicrobial agent has been effective in controlling the sepsis. Various topical chemotherapeutic agents e.g. 0.5 silver nitrate (Moyer, 1965; Monafo, 1965), Sulfamylon (Moncrief, 1966), Gentamycin (Stone, 1965) have been used with variable success. We present our experience with use of 1% soframycin cream as a topical agent in the management of burn wound. We have analysed some of the patients treated with nitrofurazone earlier and compared this group with soframycin treated group.

Material & Methods

This study includes 45 cases of burns treated with 1% soframycin (Framycetin cream) and comparison has been made with 10 patients treated with nitrofurazone. The number in the later group is small as this drug was soon discontinued because of unsatisfactory results.

The patients satisfying following criteria were included :

1. Patients with only flame burns.
2. Patients received within 24 hours of injury.
3. Patients with 10-50% B.S.A. burns.
4. Patients without pre-existing illness or associated injuries.

After initial wound toilet and debridement, a 1 mm thick layer of 1% framycetin cream was applied evenly over burn wound and absorptive occlusive dressing was done. The dressing was changed daily. All patients were managed in a general plastic surgical ward with no facilities available for isolation.

The following parameters were studied :

1. Healing time of deep dermal burns.
2. Conversion rate of deep dermal to deep burns.
3. Eschar separation time.
4. Bacterial flora on burn wound surface.
5. Incidence of invasive sepsis and positive blood culture.
6. Mortality.

Infection of burn wound was monitored by taking surface swab cultures twice a week. Blood cultures were taken once a week but repeated more frequently in cases of suspected invasive sepsis.

Observations

Whereas one patient died out of 10 in nitrofurazone group, 6 died in the soframycin group (Tab.-1). These were the cases of extensive burns. In all these patients blood cultures were positive and they died during the third week post burn.

Blood cultures were positive in 41% cases of more than 40% B.S.A. burns in soframycin treated group. In only 10% of cases were the blood culture positive in 30 to 40% B.S.A. burns. In less extensive burns invasive sepsis was not evident. On the other hand in the nitrofurazone treated group, blood cultures

Table 1. Mortality statistics

Percentage	Soframycin group		Nitrofurazone group	
	No. of patients	No. died	No. of patients	No. died
10 — 20	12	0	2	0
21 — 30	11	0	2	0
31 — 40	10	0	3	0
41 — 50	12	6	3	1
Total	45	6	10	1

Table 2. Analysis of blood culture profile

Percentage	Soframycin group		Nitrofurazone group	
	No. of patients	No. with positive culture	No. of patients	No. with positive culture
10 — 20	12	0	2	1
21 — 30	11	0	2	1
31 — 40	10	1	3	3
41 — 50	12	5	3	3
Total	45	6	10	8

Table 3. Bacterial profile of surface swabs with soframycin

Organisms	No. of times the organisms were isolated		
	1st week	2nd week	3rd week
Staphylococcus aureus	29	21	11
Pseudomonas aerogenosa	11	26	18
Klebsiella pneumoniae	3	5	9
B. Haemostreptococcus	—	—	1
B. proteus	2	2	4
E. Coli	—	1	1
Streptococcus faecalis	—	—	—

were positive in 50% of cases of 10-30% B.S.A. burns and in all cases (100%) in 30 to 50% B.S.A. burns.

Staphylococcus aureus and *psuedomonas aerogenosa* were the most common organisms colonising burn wound surface in both soframycin and nitrofurazone treated groups. In the first week post burn *staphylococcus aureus* was common but during the 2nd and the 3rd week post burn *psuedomonas aerogenosa* became common. Other gram -ve organisms i.e. *E.coli*, *B.proteus* and *Klebsiella* were uncommon and appeared later in 2nd and 3rd week.

Eschar separation in third degree burns started on an average on the 10th day in nitrofurazone group and was complete by 18th day. In the soframycin group eschar separation was delayed and occurred on an average between 21-26 days.

The healing pattern of deep dermal burns revealed quicker healing in the soframycin group (average 20 days) as compared to the nitrofurazone group (average 24 days). In soframycin treated group in about 1/3rd of the patients deep dermal burns got converted to deep burns whereas in the nitrofurazone group in about 50% of patients deep dermal burns got converted to deep 3rd degree burns.

Discussion

While comparing drug effectiveness it is appropriate to have comparable number of cases in both groups but when one of the drugs gives consistently poor results the use of the drug has to be discontinued in the interest of patient safety. However in such instances even if the number of cases are not equal we do get an idea of the drug efficacy even if comparison is not literally valid. Because of poor results the number of patients in nitrofurazone

treated group are less. However the data recorded after its use has been compared with that obtained after use of soframycin.

Bacteriological monitoring of burn wound surface in both groups showed prevalence of same type of micro-organisms i.e. *staphylococcus aureus* during the first week and *psuedomonas aerogenosa* in the later period. Both these organisms were commonly isolated on blood culture in both groups of patients but the incidence of invasive sepsis with five cultures was much higher i.e. in 80% of cases in nitrofurazone treated group as compared to 13% in soframycin treated group.

The invasive sepsis with +ve blood cultures was generally seen in extensive burns above 40% B.S.A. burns in soframycin treated patients as compared to nitrofurazone group where blood cultures were positive in even less extensive burns i.e. below 30% B.S.A. involvement, indicating that control of invasive sepsis was better in soframycin treated patients. This also explains delay in separation of eschar in 3rd degree burns and lower conversion rate of 2nd to 3rd degree burns in soframycin treated group. The mortality rates in the two groups cannot be compared because of fewer cases in nitrofurazone group, but the over all morbidity in soframycin group was much less.

Conclusion

Where as topical use of soframycin on burn wound surface did not alter the bacterial flora colonising burn wound surface or cultured from blood, it proved more effective in reducing burn wound sepsis as compared to nitrofurazone, by reducing invasive sepsis, reducing conversion of deep dermal to deep burns, reducing morbidity and ensuring early healing.

REFERENCES

1. MONAFO, W. W. JR. AND MOYAR, C. A. : Effectiveness of dilute aqueous silver nitrate in the treatment of major burns. *Arch. Surg.* 1965; 91 : 200-210.
2. MONGRIEF, J. A., LUIDBERG, R. B., WALTER A. SWITZER AND PRUIT, B. A. : The use of a topical sulphonamide in control of burn wound sepsis. *Arch. Surg.* 1966; 6 : 407.

3. MONCRIEF, J. A. AND RIVERA : The problem of infection in burns by resistant micro-organisms with a note on the use of bacitracin. *Ann. Surg.* 1958; 147 : 295-312.
4. MOYAR, C. A. : Treatment of large human burns with 0.5% silver nitrate solution, *Arch. Surg.* 1965; 90 : 812-817.
5. STONE, H. H., MARTIN, J. D. JR., HUGAR, W. E. AND KOLB, L. : Gentamycin sulphate in the treatment of psuedomonas sepsis in burns, *Surg. Gynae. Obst.* 1965; 120 : 351-352.

The Authors

PROF. C. P. SAWHNEY, M.S., F.A.M.S., *Professor and Head*, Department of Plastic Surgery, Postgraduate Institute of Medical Education and Research, Chandigarh-160012 (India).

DR. P. K. SHARMA, *Assistant Professor*, Department of Plastic Surgery, Postgraduate Institute of Medical Education and Research, Chandigarh-160012 (India).

Request for Reprints

DR. C. P. SAWHNEY, House No. 1030, Sector, 24B, Chandigarh-160023.