

Burns to the elderly: a reappraisal

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Summary—Admissions to the McIndoe burns unit over the period 1975 to 1984 were reviewed and 123 patients over the age of sixty-five were studied in detail. Comparison with standardised mortality curves showed no difference in survival rates, but review of individual cases suggests that regular examination of elderly patients could shorten admission times and reduce the mortality by encouraging prompt identification and treatment of medical complications. Patients with burns of greater than 5% of surface area should be resuscitated with intravenous fluids as this age group is very susceptible to hypotensive renal damage. Excision of burns on or before the fifth day resulted in longer admissions and increased the number of procedures per patient. Disagreement in the recent literature on this point suggests the need for a randomised, controlled trial of early excision in the elderly patient.

Elderly patients are well known to have a higher mortality, for a given percentage burn, than the general population (Bull, 1971). Multiple pathology is common and although the burn may be the cause of admission, its sequelae may be overshadowed by those of intercurrent disease. Existing medical problems may also be exacerbated by the disruptive effects of the burn upon general metabolism. This study was carried out to evaluate the effects of these problems on the management of burns in the elderly.

Material and methods

One thousand and forty-two admissions to the McIndoe burns unit over the period 1 January 1975 to 31 December 1984 were reviewed. During this period 123 patients aged 65 years or over were admitted and this group (representing 11.8% of total admissions) was studied in detail. There was an excess of females in all age groups (Fig. 1). Fifty-five patients (45%) died and analysis of the group reveals no substantial departure from the mortality curve published by Bull.

Results

Epidemiology

The majority of incidents occurred at home (105 patients, 86%), but 6 (5%) occurred in nursing homes. The most common mode of injury was flame burns, which had been sustained by 52 patients

(43%), and in a further 16 patients (13%) clothing, such as nightwear, had caught fire. Twenty patients (17%) were admitted with contact burns, which included individuals who had fallen against bar fires and radiators. In two cases the cause of injury was never elucidated (Fig. 2).

Thirty-nine patients (32% of the total) had an obvious predisposing cause. Of these, 17 (44%) "collapsed", for undetermined reasons, 3 (8%) were burned as a direct consequence of a cerebrovascular accident, and 3 (8%) as a result of previous strokes. There were 6 patients (16%) who had other neurological problems, two of whom had epileptic fits. Altogether, 17 patients were unconscious when they were burned, during which time they remained

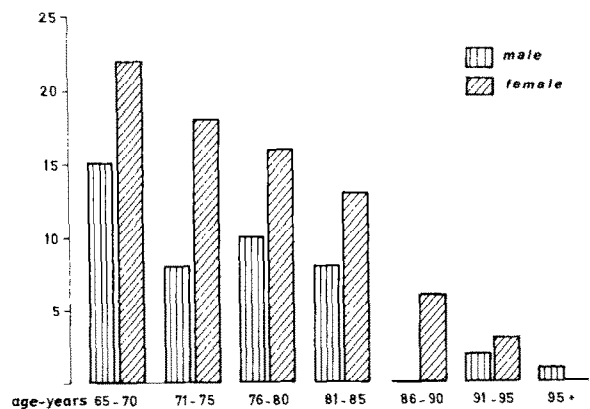


Fig. 1

Figure 1—Geriatric admissions to the McIndoe Burns Unit, 1975-1984; age and sex distribution.

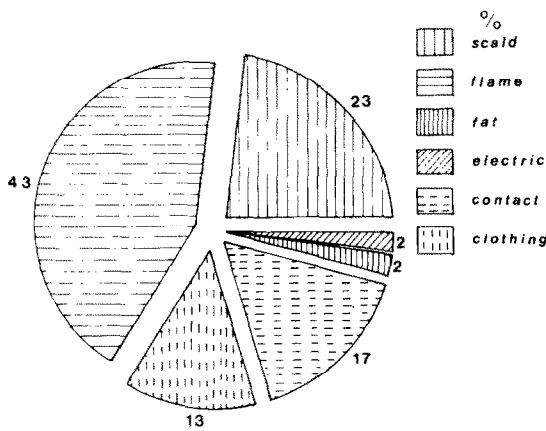


Fig. 2

Figure 2—Cause of burns to geriatric admissions 1975-1984.

in contact with the source of their injury. Six patients (16%) were burned in the course of attempted suicide and one psychotic individual set fire to herself. Perhaps surprisingly, there were no alcohol-related burns.

Size of burn and survival

There were 31 patients who had burns of less than 5%, of whom 30 (97%) survived. Prognosis for patients with burns of greater than 5% was, as expected, much worse, there being only 37 (40%) survivors. Patient selection by referring hospitals makes interpretation of results difficult as we lack any data on patients who died before reaching the burns unit, but patients with burns of less than 5% clearly do well regardless of time of transfer.

Medical problems and complications

Seventy-seven patients (63% of the total) had medical problems, of whom 41 (53%) died. Surprisingly, only 9 were reviewed by a physician and of these, 7 survived. Forty-six had no recognised medical complication and only 14 (30%) of them

died. There was no difference between the ages of the patients who had complications and those whose course was unruffled. Table 1 shows a breakdown of age against percentage burn, showing the influence of medical problems upon survival. As expected, patients with burns of less than 5% did well and the majority of patients with very large burns died, irrespective of the development of complications. However, there were significantly fewer deaths among patients who did not have complications in the 6% to 15% group. A larger sample would be needed to comment upon the 16% to 20% group.

Twenty-seven patients became oliguric at some time and of these only 2 (7%) survived. Of the group who suffered oliguria, 10 developed established renal failure and none was dialysed. Only one patient survived and although most had large burns, those who had apparently survivable injuries still succumbed. There were 19 inhalation injuries, of which 16 (84%) died with an average burn of 39%. Ten developed clinical chest problems, only one surviving (Table 2). Interestingly, in a group of elderly and immobilised patients there was only one clinical deep venous thrombosis and that in a patient with a past history. All deaths went to post-mortem and no pulmonary emboli were detected.

Early and late excision

If the watershed dividing the unit's patients into early and late excision groups is taken as 5 days, 16 burns were excised before this and 38 after (Table 3). There were no differences between the ages and percentage burn for these groups, but the early group underwent significantly more operations (mean 2.19) than the late (1.23). There was no statistical difference between the length of stay of the two groups (mean 42.13 days compared to 30.79 days). As expected, surviving patients who were not submitted for surgery had the shortest stay (mean 10 days), but this group were all assessed as having superficial burns. Clearly, patient selection

Table 1 Frequency of complications vs. percentage burn.

%TBSA	No.	Complications		No complications		p-value
		Survivors	Deaths	Survivors	Deaths	
1-5	31	18	1	12	0	n/s
6-10	27	8	7	11	1	<0.05
11-15	20	2	10	8	0	<0.001
16-20	13	5	6	2	0	n/s
21+	32	2	17	0	13	n/s

Table 2 Complications.

Cardiac (MI, arrhythmias, failure)	Patients with PMH:	22	
	Patients with complications:	22	(11)
Chest (COAD, infection, hypoxia)	Patients with PMH:	9	
	Patients with complication:	21	(7)
Neurological	Patients with PMH:	31	
	Patients with complication:	3	(3)
Diabetes Mellitus	Patients with PMH:	5	
	Patients with complication:	11	(3)
Oliguria		27	
Acute abdomen		3	
Deep venous thrombosis		1	

Figures in parentheses are patients who developed problems and who already had a past history of that condition. Some patients had several complications.

makes retrospective interpretation of these results difficult, as the unit has operated differing policies on time of burn excision over the past 10 years.

Discussion

Unlike thermal injuries to the very young, which usually occur in the presence of an adult, elderly patients often burn themselves when they are alone. One-third of patients reviewed had a clear-cut history of medical illness causing their burn and 14% were unconscious at the time of injury. This confirms the findings of the Domestic Thermal Injuries study by the Department of Trade's Consumer Safety Unit (1984) which states that "nearly all (contact burns) involved elderly people who either experienced a period of temporary unconsciousness due to an underlying medical reason . . . or who, having fallen against the appliance, were, again for medical reasons, unable to retrieve the situation". The severity of the last winter revealed that many old people rely almost exclusively on unwieldy portable gas fires and electric bar fires for heat and it is not too hard to imagine how elderly patients' disabilities might hinder their ability to extricate themselves from such a device in the event of an accident. The majority (84%) of the burns occurred at home and

probably could not have been prevented, but greater awareness of home safety, provision of modern closed heating appliances, better insulation and attention to design of accommodation, particularly kitchens, might prevent a few admissions.

Patients with burns of less than 5% developed few complications and had a low risk of mortality, regardless of time of transfer. It would seem sensible to keep this group at the source hospital, with initial management by physicians. Liaison with the regional burns unit would determine the need for eventual transfer for definitive surgery, should this prove necessary.

It is well known that a policy of early excision in younger burn patients improves survival and shortens stay (Burke *et al.*, 1974; Engrav *et al.*, 1983), but our observations suggest that it may not be so helpful in the elderly. Deitch and Clothier proposed a policy of early excision in 1983 and Deitch then (1985) reviewed the results of early and late excision in elderly patients in an uncontrolled prospective trial. He concluded that excision on or before the fifth day reduces the duration of admission. However, his study concerns itself with a younger age group and the longer admissions for our series can be partly explained by Figure 3 which demonstrates the effect of increased age upon duration of hospital stay. Our elderly patients were

Table 3 Early vs. late surgery (burns less than 20% B.S.A.).

Surgery	No.	Age	%TBSA	Stay (Days)	No. Procedures
Early	16	74 ± (6.59)	8 ± (7.21)	42 ± (23.73)	2.19 ± (1.12)
Late	38	76 ± (7.54)	8 ± (7.47)	31 ± (14.86)	1.23 ± (0.69)
Nil	12	75 ± (7.44)	6 ± (4.23)	10 ± (6.84)	

(All values expressed as mean ± standard deviation).

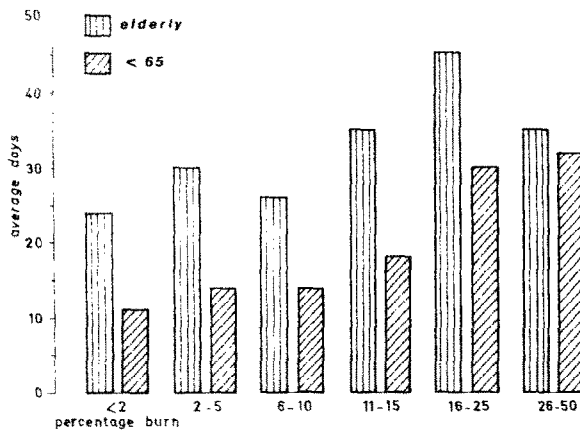


Fig. 3

Figure 3—Age and duration of admission for burns of different sizes 1975–1984.

not operated upon more often than younger patients, and therefore the longer admissions must be accounted for by problems with complications and rehabilitation.

Housinger *et al.* (1984) also reviewed a series of older patients than Deitch and provides support for our view. They concluded that intercurrent medical illness, atrophic skin and poor vascularity of graft sites all conspire against early excision in the elderly, and go so far as to recommend a policy of selected conservative management for patients aged over 60 years. The retrospective nature of our work makes a definitive statement upon timing of surgery in the elderly impossible but strongly suggests the need for a randomised, controlled clinical trial. We are currently investigating the practicality of this. If there is no advantage in a policy of early excision, then transfer of smaller burns to burn units could profitably be delayed until the eschar is ready for excision.

No patient with burns of more than 40% and only one with burns of more than 30% survived. Transfer of these very sick patients, often away from their relatives, might well be considered to be unjustified and the provision of local terminal care for elderly patients can therefore be presented as a humane option.

Even allowing for the relatively small numbers involved, there is strong statistical evidence that those patients with burns of intermediate size who developed complications were more likely to die, demonstrating the negative influence of intercurrent illness upon survival. Review of individual cases revealed instances where a physician with experience of the special needs of the elderly would

have altered management, although it is impossible to say what influence this would have had on outcome. However, in addition to a knowledge of the nuances of therapeutics in the elderly, such a physician would be able to use his greater experience to elicit physical signs in a patient already difficult to examine because of bulky dressings. Regular examination of these patients by such a practitioner might therefore pre-empt the development of potentially lethal complications.

The development of renal failure as a result of burns of less than 15% of surface area, suggests that the elderly are particularly vulnerable to hypotensive renal damage. While it is not normal practice to resuscitate burns of less than 15% with intravenous fluids, our findings would suggest that a much lower threshold is indicated in the elderly, perhaps as low as 5%. Of course, these patients are also much less able to cope with fluid overload and therefore close supervision would be required.

Conclusion

Medical problems are a major influence upon morbidity and mortality in elderly patients with burns. The specialised complaints of this group require early recognition rather than periodic emergency review, as a problem once established may become rapidly untreatable. The impact of intercurrent disease and the sequelae of ageing would appear to mitigate against a policy of early excision, but a randomised, controlled clinical trial is necessary to answer this point definitively.

We suggest that burns of more than 5% of surface area (excluding those that are clearly unsurvivable) should be resuscitated with intravenous fluids and transferred to a burns unit, as any period of oliguria has grave prognostic significance. Any burn of less than 5% can safely be kept at the source hospital until the need for surgery dictates transfer, if this is indeed necessary.

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