CASE REPORT

A GERIATRIC PATIENT WITH MAJOR BURNS

Uygur F., Noyan N., Ülkür E., Çeliköz B.

Gülhane Military Medical Academy, Haydarpafia Training Hospital, Plastic and Reconstructive Surgery and Burns Unit, T-bbiye Cad. 34668 Üsküdar, Turkey

SUMMARY. As is predictable, mortality and morbidity among geriatric patients are higher in patients with major burns. Decreased radiopulmonary reserves and malnutrition characterized by protein/energy deficiency and ageing of skin are predisposing factors which increase mortality and morbidity. In this study, we present a 90-yr-old patient with 46% total body surface area of 2nd-3rd degree burns. We had to overcome difficulties which can be seen in elderly patients and which succeeded in our treatment.

Introduction

Geriatric patients, usually defined as those older than 65 years of age, comprise approximately 10% of the major burns population. Burns in this age group constitute more serious injuries than in the general population and burns larger than 30% total body surface area (TBSA) cause an extremely high mortality. Co-morbid factors are responsible for this increase in morbidity and mortality. Elderly people have thinner skin, poorer microcirculation, and increased susceptibility to infection and the rate of burn shock, inhalation injury, pulmonary pathology, septicaemia and renal failure is higher than in younger people. If we compare the number of elderly burn patients over 80 years old with those between 65 and 80 we can see that both these groups are small, but the survival rate, especially in patients with more than 40% TBSA burns, is very low.

In this article we present a 90-yr-old patient who presented challenging difficulties in therapy and care.

The case

A 90-yr-old male patient was admitted to our burns centre after a water heater blast accident at home. Altogether 46% TBSA was burned by flame (2nd-3rd degree). The regions affected were the face, posterior neck, posterosuperior trunk, right anterosuperior trunk, the right lumbar and dorsal side of both upper extremities and both lower extremities (Figs. 1-3).

After sedation with 2 mg midazolam i.v. and 50 mg ketamine i.v., the burned areas were scrubbed with distilled water and 7.5% povidone iodine in our washroom. The wounds were closed with 0.5% chlorhexidine acetate...
and petrolatum gauze. After the initial dressing, the patient was taken to the intensive care unit and fully monitored with central venous, arterial, urinary, and nasogastric catheterization. On day 1, fluid resuscitation was administered according to the Parkland formula, i.e. 4 ml/kg/% TBSA. Crystalloid (Ringer’s lactate) was preferred. The speed of the fluid resuscitation was monitored in relation to urine output and central venous pressure. Dressings were changed daily.

Respiratory support was ensured by postural drainage, respiratory, and Tri-flow exercises, plus cold vapour. Fluid replacement was continued in order to maintain urine output at 0.5-1 cc/kg. Periodically, quantitative and exfoliative wound, urine, and haemocultures were taken. Sefoprazon + Sulbactam 1 g twice daily were initiated owing to high fever on day 3 post-burn. Acinetobacter baumannii was isolated in the haemoculture on day 8. Appropriate antibiotherapy with a sensitive antibiotic was performed. Following the onset of gastroenteritis on day 10, the oral nutritional support solutions were suspended and total parenteral nutrition was commenced. Pseudomonas aeruginosa was isolated in the wound culture on day 17 post-burn, and meropenem and amikacin were given for respectively 32 and 7 days. At the same time silver-coated dressings were applied (Acticoat, Smith and Nephew, USA). Following subdermal epinephrine infiltration, debridement and grafting were performed in 25% TBSA on post-burn day 19. An intensive physical therapy and exercise programme was initiated after post-operative day 7.

We assessed the patient’s hypotensive and oliguric state on day 26, and therapy with an inotropic agent (dopamine, 2 µg/kg/min) was initiated. After ten days’ therapy this state diminished and inotropic therapy was terminated.

Altogether the patient was hospitalized for 40 days, after which he was discharged as cured (Figs. 4-6).

Discussion and conclusion

Although burn treatment has improved during the past few years with the advent of better topical treatments, im-
proved resuscitation, and early burn eschar excision, the
prognosis still remains poor for older adult patients, and
burn injuries rank forth among the causes of injury-related
deaths in the geriatric age group. Mortality in young adults
with an 80% TBSA burn is 50%; in persons aged 60-70
yr, a 35% TBSA burn has 50% mortality, and in persons
over 70 a 20% TBSA burn will have 50% mortality. 19

Pre-morbid conditions such as chronic obstructive pul-
monary disease (COPD) and coronary artery disease may
lead to longer hospital stay, increased ventilation require-
ments, and elevated complication rates. Agarwal et al.
demonstrated that the greater fluid requirements in elder-
ly burn patients led to an increase in congestive heart fail-
ure, pulmonary oedema, and pneumonia. 10

The mortality rate also increases owing to an impaired
response to infection and sepsis, as also to decreased abil-
ity to tolerate prolonged stress and physiological insult. 11-16

The deficient nutritional state seen in elderly burned pa-
tients may also cause impaired wound healing. 17

Materials used for the purpose of smoking and stoves
are reported as frequent sources of injury in older persons,
who are most frequently burned during the course of rou-
tine daily tasks. In our case the burn was a flame burn.

Physical and physiological differences such as dimin-
ished manual dexterity, vision, and hearing, decreased mo-
bility and judgement, and slower reaction times cause in-
juries in this age group. 18 Because of the diminished reac-
tion time, the severity of burn injuries and the incidence
of inhalation injury increase in the geriatric population,
and this reduces the size of survivable burn injuries.

Prolonged immobilization and ongoing physiological
stress contribute to the significant morbidity related to in-
halation injury. Elderly people have decreased pulmonary
reserves for gas exchange and lung mechanics and they
are prone to pulmonary failure, which is a major cause of
death in all burns.

Even when inhalation injury symptoms are totally ab-
sent, the early administration of humidified oxygen and
nebulization and the use of mycotic agents, position
changes, chest physiotherapy, and early ambulation dis-
courage the development of pulmonary problems or at-
tenuate their clinical course in burns caused by flame. In
the case we describe, even though there were no signs of
inhalation injury, thanks to the early application of respi-
atory physiotherapy we did not have to treat pulmonary
problems.

In elderly people there are several well-recognized risk
factors with age, such as chronic illnesses, cardiovascular
disease, and decreased pulmonary reserve. The major caus-
es of mortality and morbidity in the elderly following ther-
mal injury are not the burn, but rather alterations due to
concomitant disease processes. In this age group, pre-
morbid states like COPD and coronary artery disease pro-
long hospitalization time and increase the need of venti-
lation support due to the complications. 19

In elderly people fluid resuscitation is important. These
people, like children, are volume-sensitive and may be at
risk of hypotensive renal damage. It is advocated that re-
suscitation fluid should be administered to elderly people
with injuries of more than 5% TBSA burns.

Resuscitation solutions should be initiated at a rate of
3-4 ml/kg/% burn and titrated to specific outcome param-
eters, evaluating any evidence of systemic overload or un-
derhydration. Adequacy of resuscitation should be surmised
at 30-50 ml/h urine output, clear mentation, and appropri-
ate blood pressure.

Even after surviving the earliest days of trauma, an
oliguric and hypotensive state can be interfaced at any time
during therapy, as in our patient, who presented such a
condition on day 26 post-burn.

Wound healing is of great concern in older people.
There are significant changes in the skin with ageing that
are responsible for the greater percentage of deep burns in
the elderly, e.g. progressive thinning of the dermis and epi-
dermis. Many factors cause a greater amount of deep burns
d and a decrease in healing in all phases, such as decreased
epidermal turnover and a decrease in skin appendages, vas-
ularity, collagen and matrix, fibroblast, and macrophage
levels. 20-22 These unfavourable factors cause a delay in ep-
ithelialization, an increase of burn depth, especially in sec-
ond-degree burn areas, and healing problems at the donor
site. In the case reported, areas that did not epithelialize
spontaneously were grafted on post-burn day 19.

One such problem, protein energy malnutrition (PEM),
has been reported to be present in at least one-third (30-
60%) of elderly patients admitted to hospital. PEM has al-
so been found to be three to four times more likely in pa-
tients over 65 years of age than in younger patients. 23-25

Malnutrition and involuntary weight loss have been shown
to be major risk factors for increased infection, impaired
wound healing, and overall disability, the major reason be-
ing a loss of body protein and lean body mass. Mortality
and morbidity rates seem to be accentuated owing to the
addition of a post-burn catabolic state to an existing body
protein and energy deficit. 26-28 By giving our patient a high-
energy, calorie-rich diet after day 2 post-burn we prevented
him from developing a state of protein and energy mal-
nutrition.

Elderly patients need to be aggressively managed to
avoid early loss of function or muscle strength, which will
be difficult to recover. These patients are capable of restor-
ing muscle strength with resistance exercise and should
not be managed conservatively. 29 As with children, pro-
viding support and guidance for the family or caretakers
is an integral part of care. We performed muscle physio-
therapy, beginning with range of motion exercises on post-
operative day 10, plus muscle strength exercises.

As a result, despite the high mortality seen in elderly
burned patients, it is possible - with early respiration physiotherapy, fluid resuscitation without overload or underhydration, challenge of infection, early surgery, and postoperative physiotherapy - high mortality and morbidity rates can be decreased in this age group.

RÉSUMÉ. Comme on peut prévoir, le taux de mortalité et de morbidité chez les patients génériques est plus élevé quand ils sont atteints de brûlures importantes. Les réserves radiopoumonaires diminuées et la malnutrition caractérisées par l’insuffisance protéinique/énergétique et le vieillissement de la peau sont des facteurs prédisposant qui augmentent la mortalité et la morbidité. Les Auteurs présentent dans cette étude le cas d’un patient de 90 ans atteint de brûlures de deuxième et troisième degré. Ils ont du surmonter les difficultés que l’on peut avoir chez les patients d’un certain âge, et notre traitement a eu succès.

BIBLIOGRAPHY


6. Ulkur E., Oncul O., Karagoz H., Celikoz B., Cavuslu S.: Comparison of silver-coated dressing (Acticoat), chlorhexidine acetate 0.5% (Bactigras), and silver sulphadiazine 1% (Silverdin) for topical antibacterial effect in Pseudomonas aeruginosa-contaminated, full-skin thickness burn wounds in rats. J. Burn Care Rehabil., 26: 430-3, 2005.

7. Ulkur E., Oncul O., Karagoz H., Yeniz E., Celikoz B.: Comparison of silver-coated dressing (Acticoat), chlorhexidine acetate 0.5% (Bactigras), and fusidic acid 2% (Fucidin) for topical antibacterial effect in methicillin-resistant Staphylococci-contaminated, full-skin thickness rat burn wounds. Burns, 31: 874-7, 2005.


