Geriatri 6 (2): 55-58, 2003
Turkish Journal of Geriatrics

ARAŞTIRMA

Dr. Arife Polat DÜZGÜN[1]
Dr. M. Mahir ÖZMEN [2]
Dr. Emrah SENEL[3]
Dr. Faruk COŞKUN[2]

FACTORS INFLUENCING MORTALITY IN ELDERLY BURN PATIENTS

YAŞLI YANIK HASTALARINDA MORTALİTEYİ ETKİLEYEN FAKTÖRLER

Amaç: Yaşlılarda görülen travmaların %8'ini yanıklar oluşturmaktadır. Çünkü yaşlılık fizyolojisine bağlı olarak görme fonksiyonlarında bozulma ve reflekslerde görülen yavaşlama travma riskini artırmaktadır. Yaşlı hastalarda yanık daha yüksek morbidite ve mortaliteye neden olmaktadır.

Hastalar ve Yöntem: 1998-2001 tarihleri arasında hastanede yatırıla rak tedavi edilen 60 yaş ve üstü 54 (34 K) hastaya ait kayıtlar retrospektif olarak değerlendirildi. Bu amaçla hasta dosyaları, yaş, cinsiyet, yanık nedeni, başvuru zamanı, yatış süresi, yanık alanı, yandaş hastalık, mortalite nedeni gibi parametreler açısından incelendi. Bu parametrelerle mortalite arasındaki ilişki analiz edildi.

Bulgular: Hastaların ortalama yaşı 70 (60-95 yaş) ve yanıkların %90'ı ev kazalarına bağlı idi.

Olguların %33 (18)'ü sıcak sıvı %60 (32)'ı alev yanığı ve %7 (3)'si elektrik yanığı idi. Hastaların %50'si yanığın olduğu gün içinde bir hastaneye başvurmuştu.

Ortalama yanık alanı %18 , ortalama yatış süresi 18 (1-64) gündü. Mortal seyreden 15 (% 31) hastada yanık alanı ortalama % 31 iken yanık alanı % 30'un üzerinde olan hastalarda mortalitenin anlamlı derecede yükseldiği saptandı. Hastalarda en sık ölüm nedeni akut böbrek yetmezli ği ve yanık komplikasyonları idi. Yandaş hastalığı olan 24 hastada morta lite oranı % 34 (8/24) olup istatistiksel anlamlılık saptanmadı.

Sonuç: Mortaliteyi etkileyen faktörler incelendiğinde sadece yanık alanının > %30 olması bağımsız prognostik faktördür. Yaşlılarda çoğunlukla yanık ev ortamındaki kazalara bağlıdır. Bu nedenle basın yayın organları aracılığı ile düzenlenecek kampanyalarla kazalara bağlı yanıklar önlenebilir.

Anahtar Kelimeler: Yanık, yaşlı, mortalite, etiyoloji, yanık alanı, yandaş hastalık.

ABSTRACT

Injury from burns makes up 8% of trauma in elderly. The elderly are at particular risk for burns because of impaired vision, decreased reaction time, depressed alertness, and decreased sensation of pain. Elderly burn patients suffer from greater morbidity and mortality than younger patients with similar burn area.

The medical records of 54 (34 F) elderly bum patients who were treated in Ankara Numune Teaching and Research Hospital between 1998 and 2001 were retrospectively analyzed. The patient files and operation notes were examined for the parameters such as age, gender, aetiology of the burn, admission time, duration of hospital stay, area of the burn, comorbid diseases, causes of mortality and the relationship between these parameters and mortality was then analyzed.

The average age of the patients treated during this period was 70 years (60-95). 90 % of the burns were due to accidents. 33% of the cases (18 patients) were hot fluid burns, 60% (32) were burns of fire-flames and 7% (4) were electrical burns. Fifty percent of the cases admitted to the hospital on the day of event.

Average burn area was 18% and average hospital stay was 18 (1-64) days. In 15 (31%) patients with fatal courses, the average burn area was 31%. The mortality rate increased significantly in patients with the burn area over 30%. The most common causes of death were acute renal failure and burn complications. When the patients were analyzed for the contribution of comorbid disease state to the mortality, the mortality rate was 34% (8/24) and this was not of statistical significance. When we analyzed the factors influencing mortality, only burn area over 30 % was found to be independent prognostic factor on mortality.

As the most burns in elderly are due to home based accidents, campaigns preferably using media should focus on prevention.

Key Words: Burns, elderly, mortality, aetiology, comorbid disease, burn area.

Geliş: 30.03.2003 Kabul: 20.05.2003

[1]Ankara Numune Hastanesi 3. Cerrahi Kliniği, Dr., [2]Ankara Numune Hastanesi 3. Cerrahi Kliniği, Doç. Dr., [3]Ankara Numune Hastanesi Yanık Ünitesi Dr.
İletişim: Dr. Arife Polat Düzgün
6. Cad. 62. Sokak No: 4/6 Etlik/ANKARA
e-mail: apolatduzgun@yahoo.com

INTRODUCTION

Injury from burns makes up 8% of elderly trauma. The elderly are at particular risk for burns because of impaired vision, decreased reaction time, depressed alertness, and decreased sensation of pain.

In 81% of elderly burn victims, injuries occurred as a result of their own action: scalding, cooking accidents with flame, and electrical burns. Even though survival from burns is directly related to total body surface area affected, this is more pronounced in the elderly. In general, burns covering more than 40% of total body surface area in elderly have very poor prognosis. Reasons for the increased mortality rate is concomitant medical disease, burn wound sepsis and multisystem failure (1).

Elderly burn patients suffer from greater morbidity and mortality than younger patients with similar burn extents (2-5). The purpose of this study is to identify the factors influencing mortality in the elderly burn patients, in our institution.

PATIENTS AND METHODS

The medical records of 54 elderly burn patients aged over 60 years, who were admitted to the hospital between January 1998 and March 2001 were analyzed retrospectively. Age, sex, causes of the burns, admission time, duration of hospitalization, aetiology of the burn, co-morbid diseases (diabetes, cardiac failure, cerebrovascular accidents (CVO), etc.), the area of the burn and related mortality rates were all recorded and the influence of these factors on mortality was then evaluated.

Statistical Analyses

All data were stored using SPSS 9.05 for Windows. Statistical analyses were performed by using *one-way ANOVA, chi-squared and t-tests* as required, p values less than 0.05 were considered as significant.

RESULTS

The age and sex distribution of patients (Table 1)

The mean (range) age of patients was 70 (60-95) years. Male/Female (M/F) ratio was 20/ 34, 63% of patients were female. The average age and the average burn area were similar in both sex. The overall mortality rate was 31% seen in 15 patients and 11 of them were female. When the mortality rates compared amongst the sex groups, the rate was significantly higher in female patients (32 % vs. 25%).

The most common cause of burns was accidents (90 %).

There were 24 (45%) patients with comorbid disease, (13 patients had cardiac failure, eight had diabetes and three had CVO) and eight of them had a mortal course.

Table 1. The age and sex distribution of patients and mortality rates.

	Male	Female	Total
N (%)	20 (37)	34 (63)	54
Burn Area (%)	17	18	18
Mortality (%)	4(25)	11(32)	15 (31)

Aetiology of the burns (Table 2)

Fire-flame burns had a prevalence of 60% (32 patients), followed by hot fluid burns of 34 % (18 patients). Three out of the 18 patients with the hot fluid burn had a mortal course, whose burn areas were over 30 %. Eleven out of 32 fire-flame burns had a mortal course. Burn areas of six of them were over 30 %. Fire-flame burns were mostly due to the LPG (gas fuel) explosion (13/32). Three out of 13 due to the LPG explosions had a mortal course, whose average burn area were 30.4 %. Average burn area of the 19 patients who burned due to other flame burns were 18%.

When these two causes were compared for related mortality, the rates were found significantly higher in fire-flame burns ($p < 0.05$).

Table 2. Aetiology of burns and mortality

Aetiology	n (%)	Burn Area (%)	Mortality n(%)
Scald	18 (34)	16.2	3 (17)
Fire-Flame	32 (60)	19.6	11(77)
LPG	*13(41)*	*30.4*	*3 (27)*
Others	*19(59)*	*18*	*8 (73)*
Electrical	4 (7)	12	1 (6)

Time of admission (Table 3)

Although 27 (50 %) of the patients admitted to the hospital in the same day of burn, 18 (33 %) patients were admitted to the hospital later than five-days and remaining 9 (17%) patients were admitted to the hospital in 2-5 days. The mean (range) delay in admission was 5.4 (1-33) days. The time of admission were being changed by aetiology of the burns and the delay was most commonly observed in hot-fluid burns. When the relation between time of admission and mortality was analyzed, no significant difference was found.

Table 3. Time of admission and mortality

Time of Admission	n (%)	Burn Area (%)	Mortality (%)
Same day	27 (50)	19	10 (37)
2-5 days	9 (17)	17	2 (22)
Later	18 (33)	16	3 (17)

Area of the burn (Table4)

Average burn area was 18 % (0.5-100) in general, it was found to be 3 1 % in patients who had a mortal course and was 1 3 % in patients who had total cure (Table 1 , 5). If the cut-off limit was taken as 30% for the burn area, mortality was significantly higher

Burn area was above 30 % at 9 patients and all of them had a mortal course.

Table 4. Cause of mortality according to aetiology of burns.

	Aetiology of Burns				
Causes of Mortality	Scald	Fire-Flame	Electrical	Total	Burn Area (%)
Renal Failure	1	6	-	7	27.5
Sepsis	-	2	-	2	30
Burn complications	2	3	-	5	41
Multiple trauma	-	-	1	1	10
Total	3	11	1	15	31

Causes of mortality (Table 4,5)

When all cases were taken into consideration, the most common cause of mortality was acute renal failure and sepsis.

7 patients had renal failure and 2 patients had multi-organ injury due to sepsis (5 burn complications, 1 multiple trauma). Average burn area was 18 % (0,5-100%), mean duration of hospital stay was 18 (1-64) days. There was no correlation between the duration of hospital stay and mortality. Mean duration of hospital stay of patients with a mortal course was 15 days, where as the duration of hospital stay was 18 days in patients with total cure.

Tablo 5. Factors influencing mortality

Factors	P*
Age	0,125
Sex	0,857
Aetiology of the burns	0,126
Time of admission	0,125
Comorbid Disease	0,606
Burn Area (>%30)	0.000
Hospital Stay	0,103

(*p values according to univariete analyses)

DISCUSSION

Burn injuries rank fourth among causes of injury-related deaths in the geriatric age group (4).

The elderly are at high risk due to exhausted organ system reserve and associated comorbid medical problems. In a study by *Cutillas M,* elderly constituted 7% of all burn related hospitalizations (6). In our study, 54 (8 %) patients were above the age of 60 years which was about 8% of all admission during same period (778 patients).

The factors determining the severity of the burn, were found to be the causes of the burn, the area of the burn, the thickness, and the localization of the burn as well as the patients age and general condition.

Comorbid disease were blamed for increased mortality in elderly patients in a great deal (2,5). In the present study (n=24) 45 % of the patients had concomitant medical disease and, (n=8) 35 % of them had a mortal course.

Continued stress from the burn injury may result in a high incidence of cardiac and cerebrovascular catastrophies especially in patients with associated medical problems. The atrophic skin of elderly patients also presents problems in burn wound and donor site healing. Wound healing is of great concern in older patients. Skin changes associated with the aging process predispose this group to poor or delayed wound healing of not only partial-thickness wounds, but also skin greft recipient beds and split-thickness skin graft donor sites. (1)

The time of admission was 5.4 day at average and, the causes of delays were found to be the living alone and being abandoned in general in the present study. This is in correlation with previous reports (7).

Overall mortality rate for elderly patients was reported as 45 % by *Stassen NA et al.* Patients older than 80 years with 40% or greater TBSA (Total body surface area) burned had a 100 % mortality rate despite aggressive treatment (5).

House fires were highest in people over 65 years or older (8,9). Low median incomes had the highest rates of house fires. Efforts to prevent injuries and deaths from house fires should target these populations.

More frequent occurance of fire-flame burns due to LPG explosions may be attributed to the accidents based on the inadequacy of older people to cover their needs of heating and cooking. 11 out of 15 mortal cases were due to fire-flames (73%). Which was 34% of all cases with fire-flame burns. This percentage is aproximately similar to electrical burns and slightly higher than burns due to scald.

When we analysed the factors influencing mortality, we found that only burn area over 30 % and burns due to fire-flames were found to be with increased risk of mortality. So that more cautions to be taken on these group of patients. Its also seems to be important to limit LPG usage by people over 65 years as it's a preventable cause of mortality.

Shortly we found that the mortality and morbidity of burn was higher in older patients so that it is important to know the special

needs of elderly burn patients as this patient group is expected to grow in parallel with the rising average age of Turkish population. As most burns are due to home-based accidents, burn prevention campaigns for elderly should focus on reducing flame and scald burns that occur in the home, preferably using television, news and poster media.

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