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Overview of Burn Injury in Srinagarind Hospital : A preliminary Report

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ภาพรวมของ Burn Injury ใน รพ.ศรีนครินทร์

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หน่วยศัลยศาสตร์ตกแต่งและเสริมสร้าง ภาควิชาศัลยศาสตร์ คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่น

การบาดเจ็บจากไฟไหม้ น้ำร้อนลวก หรือไฟฟ้าช็อต ได้ก่อให้เกิดความเสียหายทั้งร่างกาย ทรัพย์สิน และความพิกลพิการไปตลอดชีวิต นับเป็นมหันตภัยที่ร้ายแรงในปีหนึ่งๆ มีผู้ป่วยเหล่านี้เข้าทำการรักษาพยาบาลตามสถานพยาบาลต่างๆ เป็นจำนวนไม่น้อย หน่วย Burn ของ รพ.ศรีนครินทร์ ได้เปิดรับผู้ป่วยมากว่า 5 ปีแล้ว ผู้รายงานได้รวบรวมผู้ป่วยแบบย้อนหลัง 3 ปี นับแต่ปี 2527-2529 ได้ผู้ป่วย 66 ราย ได้ศึกษาถึงภาพรวมของผู้ป่วยเหล่านี้ พบว่าผู้ป่วยส่วนใหญ่เป็นเพศชาย อยู่ในวัยเด็กและวัยรุ่น สาเหตุส่วนใหญ่ได้แก่ไฟไหม้และน้ำร้อนลวก มากกว่า 50% เป็นผู้ป่วยหนักที่ต้องได้รับการดูแลรักษาจากแพทย์ผู้ชำนาญ มีอัตราตายประมาณ 9.1% สาเหตุส่วนใหญ่เกิดจากการติดเชื้อกรัมลบบริเวณแผลการรักษาส่วนใหญ่ใช้วิธีการทำแผลบ่อยครั้ง ร่วมกับการทายาฆ่าเชื้อและการลอกเนื้อตายออกและทำการปิดแผลด้วยผิวหนังเมื่อแผลดีแล้ว

Srinagarind Hospital is the only university hospital in the upper Northeastern region of Thailand. The burn unit section has been set up for more than 5 years already, but the allocated space is only 4 beds in a single room with 2 isolated room available providing for both severe burn and other appropriate general surgical cases as well. Regarded as the tirtiary center for the referring system in this region, a great

number of major burn cases from regional provinces have been referred here. An overiew of burn injury regarding age, sex, incidence, cause, severity of injury, mortality and bacteriology were reviewed. This study is only the preliminary study to express an overview of burn injury in this hospital during a 3 year period.

Incidence : A total of 66 patients were treated in the Burn Unit during the period from 1984 to 1986.

Sex Distribution : There was no absolute criteria for admission because the patients in our province directly came to the hospital while 39.4% of all patients being referred from nearby hospitals had burns with more than moderate severity. Adult male outnumbered females by 3.8:1 (51.52%/13.64%) (Figure I). This figure is nearly similar to the sex distribution of burn patients in Singapore.

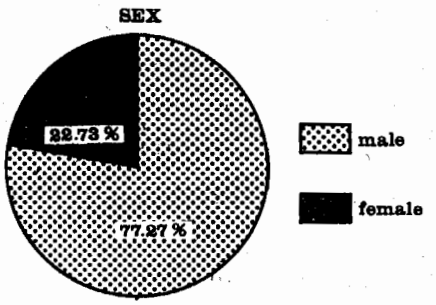

Figure 1 : Showing ratio of male to female burn patients admitted to Srinagrind Hospital Burn Unit from 1984 to 1986

Age Distribution : Ages ranged from 1 to 74 years. Nearly most of patients were confined to children and young adults below the age of 30 which accounted for 91.92%, while the children below age 12 accounted for one-third of treated cases. (34.85%) This reports corresponded well with the previous report of Sundarason in Singapore and Charoonsmith from Chulalongkorn Hospital. (Figure II)

Causes of Burn : The main causes of injury were flame burn and scald burn which accounted for 36.41 and 39.4% of all cases respectively. Electrical injury was responsible for 15.15% of all cases. (Fig. III) Leaving the children alone unsupervised was the only predisposing factor found related to the incident of injury. Two cases of epilepsy were a medical condition triggering the incidents, but there were no further epileptic-related effects on the prognosis noted. The igniting of gunpowder during a Rocket Festival claimed 2 victims in this series. Seasonal variation of cases does not point out any explanation as to cause, while there was a drop in number of cases amid the winter which contradict to assumption being that there will be an increased use of by fire in the winter months, thereby increasing the possibility of fire-related burns. (Fig. IV) A striking number of cases occured indoors at home, with most child victims falling into this group. (Fig. V) This figure corresponds with other reports. Half of the electrical Injury victims cases were electricians and the accident happened while they were working.

severity of Injury : Estimation of percentage of total burn area ranged from 1% to 95% An average of 18.30% was noted. Most of cases referred from nearby provinces were of a major burn type. Most of the electrical injuries resulted in affected parts being amputated 1-2 weeks after injury. There were 2 cases which had associated long bone fractures. No inhalation injury was detected in this series.

Mortality : There were 6 out of 66 burn patient who died (9.1%) (Table I), all of them being major burn cases. Morta-

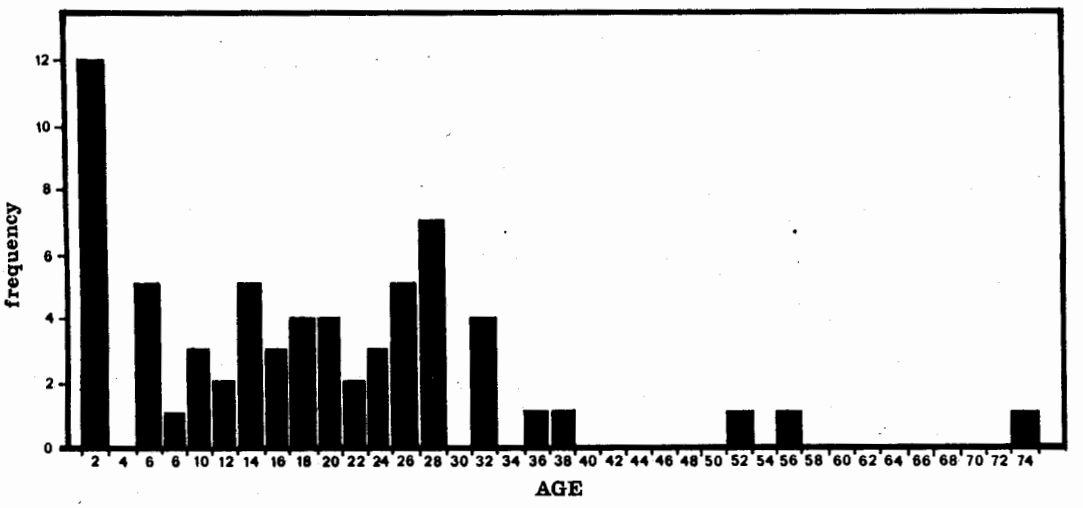

Figure 2 : Incidence of burn cases among various age groups treated at Srinagarind Hospital Burn Unit from 1981 to 1986.

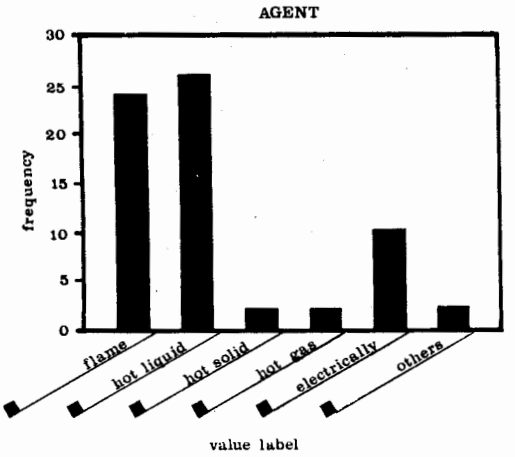

Figure 3 : Incidence of Injury as per casual agent in burn cases treated at Srinagarind Hospital Burn Unit from 1984 to 1986.

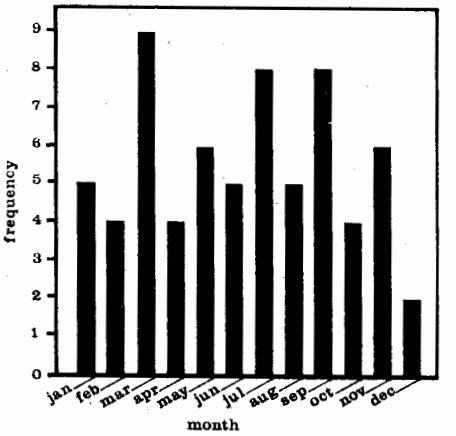

Figure 4 : Distribution of burn cases treated at Srinagarind Hospital Burn Unit from 1984 to 1986 according to month in which incident occured.

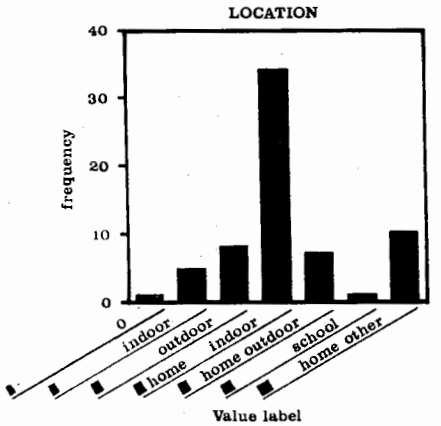

Figure 5 : Incidence of burn injury as related to location of occurence

lity rates correlated well with depth of burn and total burn area. Sepsis remained the predominant cause of death in these patients.

Bacteriology : Routine administration of prophylactic penicillin to hospitalized patients with acute thermal injury was still the norm in this series though other centers have chosen not to administer penicillin on a routine basis[7]. The trend is changing towards selective administration of prophylactic penicillin according to the appropriate indication. Burn wound cultures in cases where presence of infection was clinically suspected had been done in the early period (before 72 hours) and the latter period (after 72 hours). Two cases of burn culture were noted, one showing Staphylococcal organism and the other showing Pseudomonas organism. Gram-negative bacteria was the predominant bacteria found in the latter wound culture in which Pseudomonas was the leading bacteria involved in both single and mixed organisms. (Table II)

Management

(a) Fluid Resuscitation

Parkland's Formula is a treatment regimen for fluid administration in the early period of treatment of burn cases. Either Acetate Ringer or Ringer Lactate were the physiologic solution recommended.[1] The number of fluid administration would be adjusted to the clinical condition of the patients but a number of cases, especially referred cases, received inadequate fluid replacement,

(b) Burn wound care

Wound cleansings were done daily by

NO	Age	CAUSE	TBA	FTB	Hospitalization (Days)
1	2	Flame	30	7	9
2	27	Flame	50	30	3
3	47	Hot liquid	95	—	12
4	19	Chemical Explosion	50	20	9
5	2	Chemical Explosion	65	20	13
6	15	Electricity	80	80	3

TBA : Total Burn Area
FTB : Full Thickness Burn

Table 1 Cases of death attributable to burn showing age, specific cause, TBE, FTB, and hospitalization days at Srinagarind Hospital burn center 1984-1986.

	Early period (<72 hours)	Later period (>72 hours)
Staphylococcus aureus	1	3
Pseudomonas aeroginosa	1	3
Enterobacter	-	2
Pseudomonas aeroginosa + other gram(−)	-	5
Other mixed gram(−)	-	3
Pseudomonas aeroginosa + Staph aureus	-	1
Negative Culture	-	3
Total	**2**	**22**

Table II Frequency of organisms isolated from burn wounds 1984-1986 related to timing of cultures

using semiopened or semiclosed technique. Bacterial monitoring of burn wound was done at interval according to the presence of clinical infection. Silver sulfadiazine was used for superficial or deep second degree burn after wound cleansing. Sulfamylon was the topical antimicrobial agents of choice for 3rd degree burns with caution taken to avoid systemic side effects.

(c) Wound closure

During this period we adopted conventional therapy for burn wound management. Tangental excision with multiple wound cleansing was the technique of choice. A combination of topical antimicrobial agents with selective systemic antibiotic was the mainstay, of the treatment to control burn wound sepsis[2,3]. Until eschar removal had been accomplished, temporary closure of wound with amniotic membrane was carried out, or mesh skin graft was applied if the wound was favorable for grafting.[9,11]

Rehabilitation Physiotherapy is among the important tools to prevent or lessen the deformity of severe burn involing more than deep 2nd degree burn under the endue with an active lasting physical excercise program prescribed. However, many patients tend to neglect their follow-up visits so that scar contraction supervened.

Discusion

Burn injury is a tragic event, which condumes not only life and property but also causes deformity throughout remaining life. In order to visualize the problem of burn injury clearly, many factors affecting the occurrence and outcome of the treatment have been revieved. The Majority of burn patients predominated in male of younger age group which show a similarity to other series and reflect to the nature of high activity in these groups[4,10,12]. The major cause of burn still attributed to scald burn and injury mostly occured indoor. Which were comparable to other papers.[4,10,12] The mainly predisposing factors for young children were unlimited activity of the growing children which seems to be unavoidable without good precaution and closed supervision. Medical illness played only a minor part over the remaining

predisposing condition while seasonal variation had no effect on the number of patients admitted. There was a close correlation between occupation and incident in electrical injury noted.

Mortality rate correlated well with severity of burn and sepsis was the leading cause of death, which was invariation with other reports.[4,10] Bacteriology had nothing changed from the centers adopting conventional therapy as modalities of treatment.[4] Burn wound culture showed as to other papers in that there was predominantly gram-negative infection in the later period (>72 hours). Pseudomonas was the leading organism found in both single and mixed infections.[4]

The regimen of close attention to fluid administration and close monitoring in early care of the burn wound were able to save lives of these patients well, though some of them had less than optimum fluid resuscitation.[1]

The problem of burn wound care and coverage of burn wound were still a major task which medical teams have to bear. Due to being a newly established unit with less than adequate equipment and machinery, all of burn wounds were treated under conventional therapy.[2,3] Early excision followed by either permanent or temporary grafting or by temporary closure of burn wound by amniotic membrane showed a superior result in term of less hospital stay, fewer infectious wound complications, less number of painful ward debridement and less workload to the nurses and other paramedical personels.[6,8,13]

To deal with burn injury properly, many aspects and measures should be taken under consideration as Charoonsmith already has mentioned.[4]

1. Lack of organized and efficient transportation of the burn victims to hospital for prompt and proper treatment. This is the main factor responsible for the high mortality in burns.

2. Lack of large burn centres and inadequate bed capacity for burn patients at general hospitals. Absence of a team approach for treatment of burns, lack of adequately trained medical personnel and supporting staff. The facilities for the collection of complete statistics and information which are necessary for burns research and studies are also not available.

3. Burn prevention and public education campaigns to reduce the incidence is an important step in the preventive approach to burn injuries. The importance of prevention cannot be over-emphasized so as to reduce the high incidence of high tension electrical injuries and other preventable causes of burn injuries.

Summary

A retrospective study of burn injury was done in terms of incidence, causes and mortality in Srinagarind Hospital during a 3 year period. The management of burn patients and the problem of management were briefly discussed. The need for burn prevention and public education as well as the need for burn centers with proper facilities to treat burn patients, have been emphasized.

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