

# Epidemiology Of Adult Burns In North Trinidad

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## Abstract

**Introduction:** This study attempts to understand the epidemiology of adult burns in north Trinidad in order to determine the effectiveness of current management and make possible recommendations for improvement.

**Methods/Patients:** Data was collected from all patients admitted to the surgical wards of Port of Spain General Hospital for a burn injury during the 10 month period of January to October, 2000.

**Results:** There were 63 burns admissions in this study. Of these, 36 were female and 27 were male. Percentage Burn Surface Area ranged 50% or less and Depth of Burn of burn ranged from superficial to deep, the majority being superficial (77.8%). Formal Resuscitation was required in 23 patients and First aid performed in only 65.1% of the patients. Surgical treatment was performed in 2 of the patients, even though 12 more patients could have benefited from surgery. Reasons for this included staff shortages and shortened available operating time.

The majority of burns were sustained at home, ie 61%, however, occupational burns accounted for as much as 25%. The most common etiology was hot liquid scald.

The overall mortality of burns in our study was 7.9%.

**Conclusion:** Burn injuries pose a public health problem and more needs to be done to reduce the number of occupational injuries and promote greater awareness and practice of burn first aid in North Trinidad.

## INTRODUCTION

Burn injuries and their sequelae are major causes of morbidity and mortality worldwide. Over two million people sustain burn injuries in the U.S. every year, with the mortality ranging from 7,000 to 10,000 annually (ref<sub>1</sub>). It is the third leading cause of accidental death in the U.S. (ref<sub>2</sub>). In Western India the overall mortality of burns admissions in 1996 was 56.5% (ref<sub>3</sub>) In Zimbabwe and Iran, the mortality was 22% (1999) and 19.6% (2000) respectively (ref<sub>4</sub> and ref<sub>5</sub>).

A review of the literature revealed no data describing the epidemiology of adult burns in Trinidad and Tobago.

This study attempts to determine the epidemiology of burns admissions at the Port of Spain General Hospital (POSGH); their common causative agents; public understanding of first aid; as well as in hospital management and eventual outcome.

This information could be utilized towards formulating recommendations for improving burn management at

various levels in this country, where no specialized burns unit or formal burn education program exists.

## METHODOLOGY

This is a prospective cohort study. The sample population consisted of all patients admitted to the surgical wards of POSGH for a burn injury during the period January 1<sup>st</sup> to October 31<sup>st</sup>, 2000.

Information was gathered from each patient via a data collection form, which was completed by the admitting doctor. This form was designed by the senior author.

Prior to data collection, all surgical officers were briefed on the use of the form in order to decrease observer error in data collection.

Percentage surface area (SA) burnt was assessed using Wallace's Rule of Nines, and fluid resuscitation requirements using the Parkland Formula (i.e. Total i.v. fluid requirement for the first 24 hours = Total burn surface area (%) x Weight(kg) x 4 ).

**RESULTS**

The total number of burn admissions to the surgical ward at POSGH during the period of this study was 63.

**AGE AND SEX**

It was found that more females were admitted with burn injuries. Females accounted for 57.1% (36 admissions) and males, 42.9 % (27 admissions).

The following table (table 1) shows the age distribution of burn patients at POSGH.

**Figure 1**

Table 1: Age distribution of burn admissions

Age Range	Frequency
11- 19	14
20 –35	22
36- 59	21
>59	6

**COMORBIDITY**

Ten patients (15.9%) of the sample population had some form of concurrent medical illness (table 2).

**Figure 2**

Table 2: Co morbidity among burn patients

Disease	Frequency
Diabetes	3 (4.8%)
Hypertension	2 (3.2%)
Ischemic Heart disease	1 (1.6%)
Psychiatric	1 (1.6%)
Other	3 (4.8%)
Nil	53 (84%)

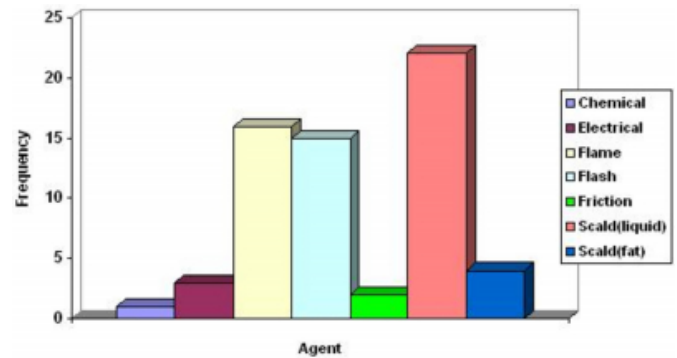
Eighteen burn patients (29.6%) were smokers, 66.6% of these smoked less than 10 cigarettes per day. Seventeen patients drank alcohol (27%).

**ETIOLOGY AND PLACE OF INJURY**

The three most common reasons for burn injury were scald (39.9%), flame burns (25.4%) and flash burns (23.8%). Other causes accounted for 9.6% of the burn admissions (figure 1.)

**Figure 3**

Figure 1: Aetiology of Burn Injuries

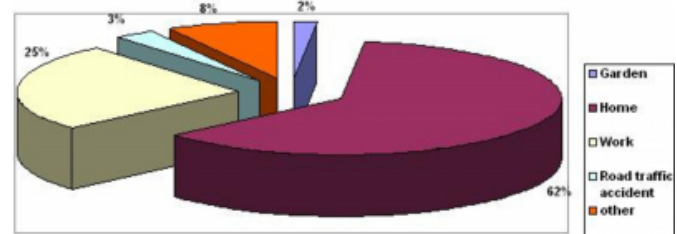


The commonest cause of burn in women was from hot water scald (44.4%). In males flame injury accounted for an equal number of burns as flash injury (29.6 % each). All electrical burns occurred in men.

Eighty percent of the women in the sample were burnt at home (29 patients) where as 37% of men were burnt at home. Occupational injuries were the commonest cause of burns in men (11patients, 40.7% of men). Figure 2 demonstrates the places at which burn injuries occurred.

**Figure 4**

Figure 2: Place at which Burn Injuries Occurred



The commonest location was at home (62%) followed by occupational burn injuries (25.4%). Each of the causative agents was more likely to occur at home except electrical burns.

The chemical burn occurred at home and both friction burns were the result of road traffic accidents.

**TRENDS IN OCCUPATIONAL BURNS**

Kitchen workers (6 patients), and car workers ( 4 patients) were injured most frequently. Other admissions included a plumber, a painter, a salesman and a truck driver.

Scald injuries were most common at 40%, followed by flash (33%), flame (20%) and electrical (6.6% of job related burns).

Most occupational burns were not severe: 86% being superficial and two thirds being less than 10% burn surface area.

No protective garment was worn in 86% and 53.3% performed no First aid.

Face was burnt in 40%, upper limb in 60% and the lower limb in 13% of occupational injuries.

**BURN SURFACE AREA**

The majority of admissions sustained burns less than 30 % total body surface area (TBSA). This accounted for 96.8 %.

There were no major burns were greater than 50% TBSA in this study.

**DEPTH OF BURN**

Forty nine patients (77.8%) had superficial burns only. The remainder had either deep or mixed dermal burns (Table 3 below)

**Figure 5**

Table 3: Depth of burns

Depth of burn	Frequency
Superficial	49 (77.8%)
Superficial + Deep	8 (12.7%)
Deep	3 (4.8%)
Deep + Full thickness	2 (3.2%)
Superficial + full	1 (1.6%)

**BODY SITE OF INJURY**

The body sites most prone to burn injury in our study were the face and the upper limb as shown in table 4.

**Figure 6**

Table 4: The Probability of being burnt at any one body site.

Body site	Frequency	Percentage
<b>Head and Neck</b>		
Face	27	42.9
Neck	9	14.3
Scalp	3	4.8
<b>Upper Limb</b>		
Hand	18	28.6
Forearm	33	52.4
Elbow	6	10
Arm	20	31.7
Shoulder	5	6.8
<b>Chest</b>		
Chest	7	11.1
<b>Back</b>		
Back	10	16
<b>Abdomen</b>		
Abdomen	5	7.9
<b>Lower Limb</b>		
Buttock	3	4.8
Thigh	11	17.5
Knee	1	1.6
Leg	10	16
Foot	1	1.6

**FIRST AID TREATMENT**

No first aid was performed in 33.3% (21 patients). Of those who did perform first aid (41 patients), half did so inadequately. Only one patient performed homeopathic medicine for first aid.

**RESUSCITATION**

No formal resuscitation was required in 63.5% (40 patients). Of those requiring fluid resuscitation 9.5% were given oral fluids, 27% intravenous crystalloid infusion and 1 patient required blood transfusion.

Airway resuscitation was given to 15.9% of the patients. Two patients required intubation and eight required high flow nasal or mask oxygen.

Smoke inhalation occurred in two patients.

**TREATMENT**

Conservative management with exposure, application of tulle gras or flamazine was performed in all but 3 patients.

Surgical treatment was performed in 2 patients in the form of excision and skin grafting.

### COMPLICATIONS

The majority of burn admissions (83.2%) developed no short or medium term complications.

Complications encountered were:

Local wound infection (4 patients), chest infection (1 patient), joint contracture (1 patient) and aggravation of a pterygium of the eye (1 patient).

### MORTALITY

There were 3 burn fatalities in our study:

- A 60 year old with a 50% burn
- A 94 year old with a 7% full thickness burn
- An 18 year old with a 35% full thickness burn with concomitant inhalational injury.

### DISCUSSION

Port of Spain General Hospital provides surgical services for the adult population of most of North Trinidad. In any population, the paediatric age group accounts for the majority of burn injuries (ref <sub>6</sub>). Our study therefore does not provide information for this segment of the population of North Trinidad.

The rate of co morbid disease in this study (15.9%) is slightly higher than that found in most first world countries (8 to 9%)(ref <sub>7</sub>). Diabetes was most common among burn patients. This is not surprising considering the relatively high rate of diabetes in the adult population of Trinidad. First world data found did not quote diabetes as a major co morbid disease, probably accounting for this difference.

South Trinidad is the location of most of the country's industrial sites. This may explain the high incidence of domestic burns (62%) and the low incidence of chemical burns in our study despite the country's relatively large petrochemical industry. In fact, in industrialized or first world countries, flame burns usually outnumber scalds.

Also, the lower incidence of flame injuries may be product of a successful national fire safety and prevention programme undertaken by the nation's fire service.

It is a common practice in Trinidad to attempt backyard

waste disposal by outdoor fires, dashed with petrol or kerosene. This, and throwing fuel on barbecues, may explain the high rate of flash injuries (24%) in our study. Barbecue accidents have been well documented in other countries (ref <sub>6</sub>).

The occupational burn rate in North Trinidad (25.4%) was comparable to some Turkish rates (24.3%) and Welsh rates (20%) (ref <sub>8</sub> and ref <sub>9</sub>, respectively). However, the authors of the Turkish study still supported burn prevention programmes.

First aid was not performed in a third of patients, and of those who did, more than half did so inadequately. Adequate first aid is defined by the Emergency Management of Severe Burns (EMSB) course as removal of clothing and irrigation with tap water for at least 20 minutes. No other international source accepted less than 10 minutes water irrigation as acceptable first aid (ref <sub>10</sub>). Therefore, almost half of the patients in our study performed inadequate first aid by any standard.

With respect to the surgical management of burns, early excision and skin grafting of deep burns is far superior over conventional treatment (ref <sub>11</sub>). It reduces infective complications, reduces mortality (ref <sub>12</sub>), shortens hospital stay and, improves functional and aesthetic outcome (ref <sub>11</sub>). Hence the benefits of early excision and split skin grafting out way the risks. The low incidence of this surgical practice in our study

(2 operations out of a possible 14 with deep burns) is not a reflection of the attitude of the authors but rather the inadequate facilities at Port Of Spain General Hospital. These include shortage of blood products and operating time, and a lack of basic theatre equipment required for this procedure such as an electric dermatome and a mesher.

### RECOMMENDATIONS

1. The implementation of an education programme for burn first aid. The rate of inadequate first aid practice is too high. First aid has been proven to be useful in stopping the burning process, reducing post burn hyperthermia and pain, and reducing burn morbidity (ref <sub>10</sub> and ref <sub>13</sub>)
2. The development of an occupational burn awareness programme targeting all workers prone to scald, flame, chemical or electrical injury with focus on kitchen workers and car workers as these

groups were most at risk as shown in this study.

3. Occupational safety can be improved with greater use of protective garments in the form of gloves, shoes, aprons/ overalls, and goggles or masks where ever possible since these body sites are most prone to burn injury.
4. Improved tertiary facilities for surgical burn management in north Trinidad.
5. Continuing data collection and auditing to assess whether these and prior measures are improving outcome.
6. Further studies to determine the epidemiology of burns in the paediatric population.

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