

ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE



**ASSESSMENT OF THE PREVALENCE AND MANAGEMENT
OUTCOME OF PEDIATRIC BURN INJURY IN ADDIS ABABA
BURN EMERGENCY AND TRAUMA HOSPITAL, ETHIOPIA**

BY: DR. ADISU YIMAM (INTERM)

**A STUDENT RESEARCH REPORT SUBMITTED TO THE
DEPARTMENT OF PUBLIC HEALTH, SPHMMC IN PARTIAL
FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF
DOCTOR OF MEDICINE**

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Acronyms and Abbreviations

AaBET	Addis Ababa Burn Emergency and Trauma Hospital
ICU	Intensive Care Unit
IV	Intravenous
SD	Standard Deviation
SES	Socio Economic Status
SPHMMC	St Paul's Hospital Millennium Medical College
SPSS	Statistical Package for Social Study
TB	Tuberculosis
TBSA	Total Body Surface Area
UK	United Kingdom
USA	United States of America

LIST OF TABLES AND FIGURES

TABLE 1	Socio demographic information of the pediatric patients
TABLE 2	The Anatomic distributions of the burn
Figure 1	The Etiology of the burn
Figure 2	The percentage of the TBSA that is burned

ABSTRACT

Background: - Burn injuries constitute a major public health problem and are the leading cause of childhood morbidity and mortality worldwide. Pediatric burns have a long-term social impact. This is more apparent in a developing country such as Ethiopia, where their incidence and morbidity are high. Very little is known about burn injuries in Ethiopia. The aim of this study is to provide recent retrospective epidemiological data on pediatric burns in Ethiopia and to suggest future preventive strategies.

Objective: - This paper aims to assess the prevalence and management outcome of pediatric burn injury in Addis Ababa Burn, Emergency, and Trauma (AaBET) Hospital, Ethiopia.

Methods: - This research was based in Addis Ababa Burn, Emergency and Trauma (AaBET) Hospital, Ethiopia and it was a retrospective institutional based cross-sectional study. The data was collected from pediatric patients' data who were evaluated during a two-year period from 2016 to 2018. All pediatric patient files with assessment of burn injury was retrieved and data was collected on the data collection instrument. The data was then filled on SPSS 21.0. Appropriate analysis of different sociodemographic characteristics was done. The results were presented using graphs and tables. Possible associations were evaluated using chi-square method. A p-value less than 0.05 will be considered as statistically significant association.

Results: - A total of 140 children with major burns were seen, 70 were males and 70 were females. The ages ranged from 6 months to 15 years with mean age of 4.7 years. 72.1% of the cases occurred among children under five years of age. Scald were the leading cause of burns, occurring in 70% of the cases. The TBSA ranged from 4% to 70% with mean TBSA of 12.92%. The mortality rate was 5.7%.

Conclusion: - the study showed that pediatric burns vary across age in which the under five children were more susceptible to burn injuries. The predominant cause of burn was scald. The mortality rate is relatively higher compared with other studies. The level of awareness about burns prevention among the population and health care facilities should be improved.

1. INTRODUCTION

1.1. BACKGROUND

A burn injury is a coagulative damage or destruction of skin and/or its contents by Thermal, Chemical, and Electrical, Radiation energies or combinations. Burns are a leading cause of unintentional death in children, second only to motor vehicle crashes. (1) Burn injury is a public health concern and are the leading cause of childhood morbidity and mortality worldwide. It is associated with pain, emotional stress, prolonged hospitalization, permanent disfigurement and family stress. (2, 3) More than 90% of burns are caused by carelessness or ignorance and are completely preventable. Most affected groups are children and young adults. (4, 5)

Based on the mechanism of injury burns are classified in to scald burn, flame burn, flash burn, contact burn, chemical burn and electrical burn. Among these, Scalds from hot water are the most common cause of burn. Depth of burn is proportional to the temperature, duration of contact & thickness of skin. Water at 140°F (60°C) creates a deep partial-thickness or full-thickness burn in 3 seconds. At 156°F (69°C), the same burn occurs in 1 second. Deliberate scalds are a common form of reported child abuse and are responsible for about 5% of the pediatric admissions to burn centers. (1, 6, 7, 8)

Depending on the depth of injury burns are classified in to First degree, second degree, third degree, and fourth degree burn. First degree (superficial) burn involves only the epidermis. Second degree (partial thickness) burn classified again in to superficial and deep. The superficial second degree involve no deeper than the papillary dermis. The deep second degree burn involves damage to the deeper parts of the reticular dermis. Third degree (full thickness) destroys all layers of skin. Fourth degree burn involves underlying structures like bone and tendons. (1, 9, 10)

Extent of burn injury is estimated by many methods. The rule of nines is the best-known method of estimating burn extent. The method tells the total body surface area that is burned. The management of burn focuses on first aid, adequate fluid resuscitation, nutritional support, wound care. (1, 11, 12)

1.2. STATEMENT OF THE PROBLEM

Burn injuries are a major cause for hospitalization and are associated with significant morbidity and mortality, particularly in children under the age of five years. (1, 14, 15) it is also a major cause of morbidity and mortality in individuals of all age groups, particularly in individuals living in the developing countries. (16, 17, 18)

The incidence of burn injury varies greatly between countries. More than 90% of burns occur in the developing world. In UK 175,000 burned patients seek health care annually. Among these, 13,000 burned patients need hospital admission and 1000 of them have severe burns requiring fluid resuscitation. Of these burn victim's half of them are below 16 years old. In USA 1.1 million burned patients seek medical care annually. Among these, 45,000 of the patients need hospitalization and 4500 of the victims dead due to burn.(19,20) In Ethiopia, a community based study on 7309 individuals in 1390 households and found an annual incidence of 1.2% highest being among children less than 5 years of age 4.8%. The Leading causes were scald 59% followed by flame 34% and most occurring at home 81 %.(22, 23)

The contributing factors for burn are socio-economic factors, living conditions, medical conditions, and child abuse and gender violence. Among these poverty is the major risk factor of burn. Children from low income homes have 8 times greater risk of sustaining burns than those from higher income homes. (1, 21) Severity of burns increases with decreasing socioeconomic status (SES). Burn mortality is higher among children from lower socioeconomic status (SES). (24, 25)

Children are naturally curious, impulsive and active. As a result, living conditions like: flammable and caustic substances stored in the home, heating with indoor fires, cooking practices, flammable clothing, homes made of highly combustible materials, lack of adult supervision and overcrowding predisposes them to increasing risk of burns. The other contributing factors are medical conditions that can increase risk of fall. These includes epilepsy and conditions leading to febrile seizures like pneumonia, meningitis, gastroenteritis and TB. (1, 2, 3)

Despite the higher prevalence of pediatric burn injury, there are no extensive studies done on the prevalence of pediatric burn injury. Therefore, this study is done to determine the magnitude of

pediatric burn injury in this particular setup and to explore how much burden it posed to the community.

In addition, the study will also try to assess the association of factors associated with burn and the management outcome of pediatric burn injury in this particular setup in patients who were treated in the last one year.

As there are no enough studies done on prevalence and management outcome of pediatric burn injury in Addis Ababa, this study is aiming at contributing the current status and the management outcome of pediatric burn injury to the scientific community. As a result, recommendations will be made on the prevention of predisposing factors and adequate treatment of pediatric burn injury without delay. Consequently, the impact that pediatric burn injury poses to the community in many ways like financial problems and disability will be reduced.

1.3. SIGNIFICANCE OF THE STUDY

The study was done in Addis Ababa Burn Emergency and Trauma (AaBET) Hospital. The generalizations made based on the obtained result through this study are specific to this setup. This study was done to contribute to the scientific community about the current prevalence of pediatric burn injury and its management outcome. In addition, the study found the common contributing factors so interventions could be made to reduce the magnitude of pediatric burn injury.

As a result, the condition will get great emphasis and national action will be implemented towards burn injury. Therefore, pediatric patients will get adequate medical or surgical treatment without delay. Therefore, this research has great deal of importance in minimizing the community burden and health consequences of pediatric burn injury.

As there are no enough studies done on prevalence and management outcome of pediatric burn injury in Addis Ababa, this study is aiming at contributing the current status and the management outcome of pediatric burn injury to the scientific community. As a result, recommendations will be made on the prevention of predisposing factors and adequate treatment of pediatric burn injury without delay. Consequently, the impact that pediatric burn injury poses to the community in many ways like financial problems and disability will be reduced.

2. LITRETURE REVIEW

Researches done in the world

In a study conducted in Iran University of Medical Sciences, Tehran, Iran to assess the etiology, outcome and mortality risk factors in children burn using the medical records of 514 patients with burn, they have found the following data. Burns caused by scalding were the most frequent (55.4%) followed by flames (35.8%). Mean (SD) of age was 3.72 (3.19) years. Male to female ratio was 1.62:1. Mean hospital stay was 14.17 days (range 0 - 46 days). The mean TBSA (SD) was 15.22% (14.31%). (3)

Another systemic literature review done in South Asia using A MEDLINE/PUBMED search (1970– 2011) was undertaken on empirical studies that focused on burns in India, Pakistan, Bangladesh and Sri Lanka. Data analyzed included demographics, injury details and risk factors and found the following data. Burns were more common among males at younger ages (0–12 years) and among females from adolescence onward (14 years). Flame-related burns and scalds accounted for over 80% of burns in most cases, and were the most common types of injuries observed among children and women with most burns occurring in the home. Electrical burns occurred mostly among men. Important risk factors for burns included low socioeconomic status, being younger, wearing loose, flammable clothing and the use of kerosene. But the data on care-seeking and treatment were limited. (24)

Researches done in Africa

In a study done in Cairo University Hospital, Egypt to assess the epidemiology and outcomes of pediatric burn injuries using the medical records of 564 children, they have found the following data. The average age of the children was 5.9 years (SD: ± 4.1). Under five children were found to be the most susceptible to burn injuries accounting for about 70% of the affected population. There was no significant difference in the number of patients between genders. While scald type of burn was the most prevalent etiology of burn injuries representing more than 60% of all causes. Total burn surface area (TBSA) % was greater among females, patients from rural residencies and flame type of burn. (10)

In another study done in Komfo Anokye Teaching Hospital, Ghana to assess the epidemiology of burn patients in a burn center in Ghana Using the medical record of 487 patients have found the following data. Data on burn admissions comprising 263 (54.0 %) males and 224 (46.0 %) females were obtained from the Burns Registry. Children 0–10 years were the most affected age group. The yearly mean % TBSA ranged from 24.74% to 35.07 %. The majority of burns was caused by scalding. Mortality rates ranged from 8.4 % to 32.0 % during the period under review. The study shows that children of 10 years old and below are the most affected group; this may be due to inattention to these children by parents/caretakers. (12)

Researches done in Ethiopia

In a community based study in Mekele town, northern Ethiopia to assess the epidemiology of burn injuries by a cross-sectional survey using 7309 individuals have found the following data. The annual incidence in burns was 1.2%. Burn had the highest incidence among children less than 5 years old (4.8%). Scald (59%) was the leading cause of burn followed by flame (34%). Most burns occurred at home (81%). Eighty-nine point four percent of the burns healed with minor or no sequelae, 9.4% developed sequelae and the mortality was 1%. Crowding and employment were significant risk factors for burn injury. Domestic burn injuries were common among women of reproductive age and work related burns were more common among men. Many people (36%) used harmful substances with deleterious consequences as first aid measure for burn. (23)

In another study done in Attat Hospital (Rural Ethiopia) for the years 1983-1989, to determine the prevalence of burns and knowledge of first aid for burns in 16 communities using the medical records of 271 admitted burn patients have found the following data. The cumulative incidence of burns in this population was found to be 5-11%. The absence of a cumulative increase in burns over time in men suggests that female respondents may not fully recall burn histories in adult male household members. The study population possess inadequate knowledge regarding burn prevention and burn first aid. (25)

3. RESEARCH OBJECTIVES

3.1. GENERAL OBJECTIVE

- To assess the prevalence and management outcome of pediatric burn injury in Addis Ababa Burn Emergency and Trauma (AaBET) Hospital, Ethiopia.

3.2. SPECIFIC OBJECTIVES

- To determine the prevalence of pediatric burn injury in AaBET Hospital, Addis Ababa, Ethiopia.
- To assess the association of factors that contributes to burn injury in children
- To assess the management outcome of pediatric burn injury patients who were admitted.

4. RESEARCH METHODS AND MATERIALS

4.1. STUDY SETTING

Addis Ababa Burn Emergency and Trauma Hospital (AaBET hospital) is an affiliate's of St Paul's Hospital Millennium Medical College. It was established in 2007 E.C (2016 G.C) with the aim of providing quality emergency service in Ethiopia. The hospital is located in the way from SPHMMC to Piassa around Yoannes church 500 meters away from the main road. The hospital's building has four floors. It has around 300 beds.

The ground part is for emergency services. It is divided in to red, orange and yellow green areas. This is to categorize patients based on the severity of their conditions at presentation. The first floor is for operation theatre and recovery room. The second floor consists of ICU and burn unit. The third floor consists of orthopedic and neurosurgery ward. The fourth floor contains the pediatric orthopedic ward and general surgery ward.

The hospital is also a center for forensic analysis. It has more than 1000 staffs. It is the only trauma center in Addis Ababa. It accepts many patients from surrounding regions. The burn unit was started on August, 2008 E.C.

4.2. STUDY DESIGN

An institutional based retrospective descriptive study design was used to study the prevalence of pediatric burn injury and its outcome of management in a two-year period from June 2016 to June 2018 G.C.

SOURCE POPULATION

All pediatric patients who were admitted to AaBET hospital from the period June 2016 to June 2018 G.C.

STUDY POPULATION

All pediatric patients admitted to AaBET hospital Burn Unit with the assessment of burn injury from the period June 2016 to June 2018 G.C are included.

INCLUSION AND EXCLUSION CRITERIA

INCLUSION CRITERIA

- All pediatric patients who were admitted to AaBET Hospital Burn Unit with the diagnosis of burn injury from the period June 2016 to June 2018 G.C are included.

EXCLUSION CRITERIA

- Patients with medical records which had missing information which is relevant for this study like: complete history, physical examination and baseline investigations.
- Patients with lost card were also excluded from the study.

Sample size determination

The sample size was calculated using the following formula.

$$n = \frac{\frac{Z^2 p(1-p)}{d^2}}{1 + \frac{1}{N} \left(\frac{Z^2 p(1-p)}{d^2} \right)}$$

$$n = \frac{\frac{1.96^2 0.012(1-0.012)}{0.04^2}}{1 + \frac{1}{154} \left(\frac{1.96^2 0.012(1-0.012)}{0.04^2} \right)} = \text{All the pediatric patients who were admitted and treated}$$

for burn injury were included in the sample size.

4.3. SAMPLING TECHNIQUE/PROCEDURE

In the study population, all the pediatric patients admitted with assessment of burn injury were included. All of the available patients were purposively a candidate for the study. Because of the small size of the source population.

4.4. DATA COLLECTION

Data was collected from patient records using a self-developed data collection form. The study population list was obtained from the log book at the AaBET Hospital Burn unit and charts with the specified diagnosis of pediatric burn injury was collected and pertinent information from the chart was copied to the data collection form. Data was collected by the researcher on the specified date in the work plan of the research proposal.

4.5. STUDY VARIABLES

INDEPENDENT VARIABLES:

- Socio demographic information
 - Age
 - Sex
 - Religion
 - Residence
- Etiology of burn
 - Scald
 - Flame
 - Flash
 - Electrical
 - Chemical
- The TBSA burnt
 - 1-10%
 - 11-20%
 - 20-30%
 - 31-40%
 - 41-50%
 - >50%
- Degree of involvement of the burn
 - First degree
 - Second degree
 - Third degree
- Anatomic distribution of the burn
 - Face and neck
 - Anterior and posterior trunk
 - Upper limb
 - Buttock
 - Lower limb
- The need for ICU admission

- Reason for ICU admission
 - Sepsis
 - Respiratory distress
 - Acute renal failure
- Type of treatment received
 - IV fluid
 - Antibiotics and analgesics
 - Surgery
- Total duration of stay in the burn unit
- Prevalence of burn injury

DEPENDENT VARIABLES:

- The patterns of pediatric burn injury in AaBET Hospital Burn Unit.
- The management outcome of pediatric burn injury in AaBET Hospital Burn unit.
 - Improved
 - Dead

4.6. OPERATIONAL DEFINITION

Burn injury: is a coagulative damage or destruction of skin and/or its contents by Thermal, Chemical, Electrical, or Radiation energies.

Management outcome: is the patient's condition after treatment which can be either improvement or death.

4.7. DATA PROCESSING AND MANAGEMENT

The collected data was manually checked for completeness, accuracy and clarity. Those which were incomplete were left out of the analysis. Then it was managed by proper entry into the computer statistical package program SPSS by the researcher.

4.8. DATA ANALYSIS

The data collected using a data collection form was analyzed using the statistical package SPSS 21.0. Different statistical analysis were used including descriptive statistics with frequencies of variables and bi-variant analysis using correlation and determination of statistical significance using chi-square test. A p-value less than 0.05 was considered statistically significant.

4.9. ETHICAL CONSIDERATIONS

Before getting the data collection process, a permission letter from St Paul's Hospital Millennium Medical College was obtained. Showing the letter to the medical director of AaBET Hospital, permission to collect the data was obtained. And all information obtained in the process of this research was kept confidential by keeping cards on the hand of the researcher.

4.10. DISSEMINATION OF FINDINGS

After the completion of this research, the findings was submitted to St Paul's Hospital Millennium Medical College public health department and will be uploaded on the internet so that it will serve all researchers who are interested in the subject matter.

5. RESULTS

Socio demographic characteristics

One hundred and forty four pediatric patients with burn aged up to 15 years were admitted to the burn unit at Addis Ababa Burn Emergency and Trauma Hospital in the last two years. Four incomplete cases were left out and 140 cases were enrolled in the study. All of them were used purposively due to the small size of the study population. Of the 140 patients, 70 were males and 70 were females. There was no significant difference in the number of patients between genders. The age of the children ranges from 0.5 to 15 years with mean age of 4.7 (SD: 4.3) and median age of 3 years. Most 101 (72.1%) of them were five and below five years. The majority of the patients 62 (44.3%) come from Addis Ababa and Oromia 61 (43.6%). Most of the patients are Orthodox Christian in religion 66 (47.1%). (Table 1).

Table 1; Socio demographic information of the patients

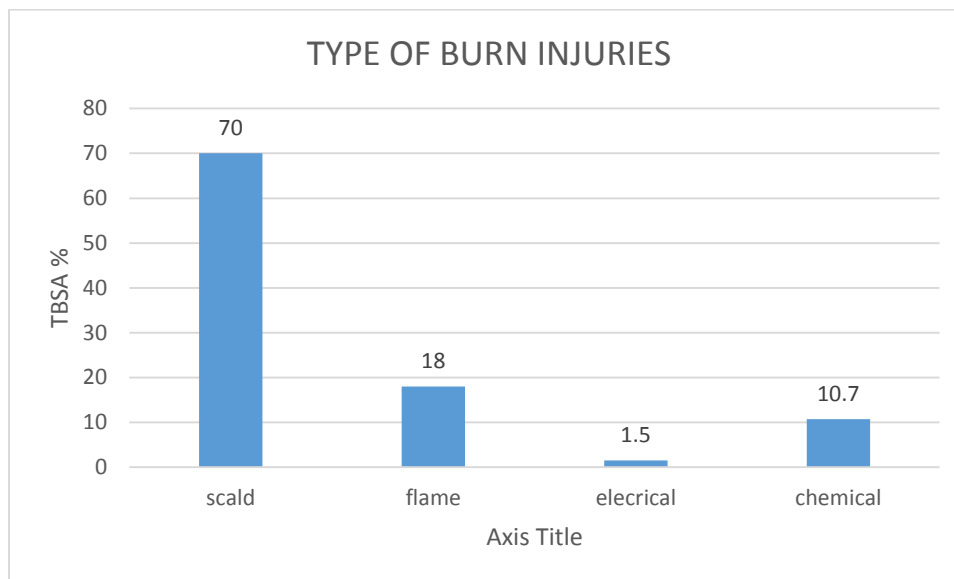
Variables		frequency	percent
Sex	male	70	50
	female	70	50
Age	0.5-5 years	101	72.1
	6-10 years	17	12.1
	11-15 years	22	15.7
Religion	Orthodox Christian	66	47.1
	Muslim	33	23.6
	Protestant	39	27.9
	Catholic	2	1.4
Residence	Addis Ababa	62	44.3
	Amhara	5	3.6
	Oromia	61	43.6
	Gurage	3	2.1
	Others	9	6.4

*others represent Tigray, Afar, Gambelia, Somalia, SNNPR and Benshangul Gumuz

Etiology and extent of burn

Scald burns were the leading cause of burn injuries, accounting for 70% of all burn injuries.

Fig 1: Etiology of the burn

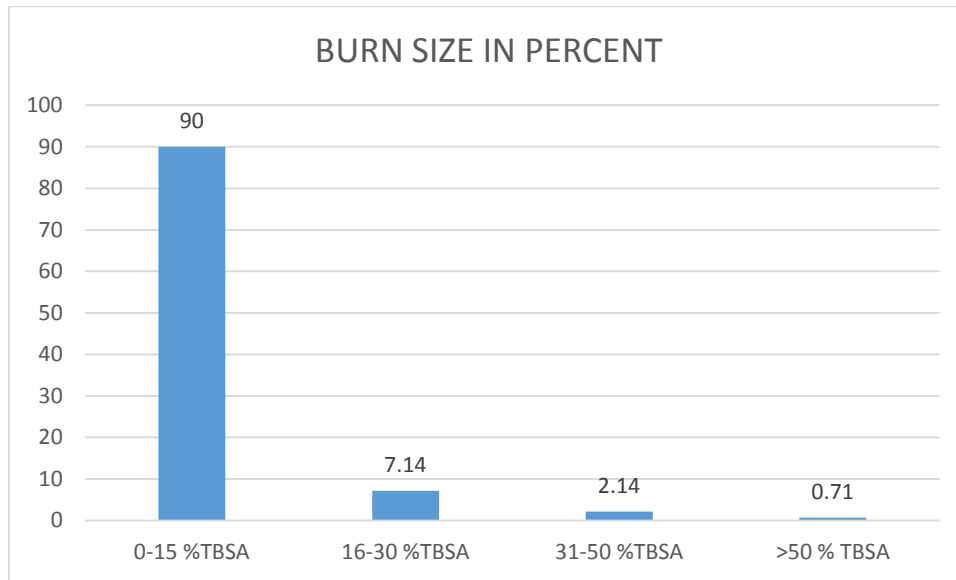


There was no statistically significant difference between the gender of the patients and the etiologic agents ($p = 0.163$).

Extent of the burn

The total body surface area (TBSA) involved in burns in the cases ranged from 4% to 70% with median and mean value of 12 and 12.92 respectively. There was no statistically significant difference between the mean TBSA and gender of the patients ($p = 0.20$). About 90% of the studied sample had TBSA% burnt less than 15%.

Fig 2: TBSA burned



Of the 140 patients, 90% of them have second degree burn and 10% of them have third degree burn. There was an association between the age groups and the extent of burns ($p= 0.02$).

Anatomic distribution of the burns

The most commonly involved parts of the body are the upper limb at 61.4%, lower limb at 33.6% and anterior trunk at 27.1%.

Table 2: Anatomic distribution of burns

Part of body	frequency	percent
face	4	2.9
neck	8	5.7
Anterior trunk	38	27.1
Posterior trunk	3	2.1
Upper limb	86	61.4
buttock	19	13.6
Lower limb	47	33.6

Length of hospital stays

The number of days spent on admission in the hospital by the patients ranged from one day to 180 days; with median and mean of 14 and 19.03 days respectively.

Outcome of management

A total of 132 (94.3%) cases were successfully managed and discharged while 8 (5.7%) of them died. About three patients were admitted to ICU, the reason being sepsis in all cases. All of the studied sample received IV fluid, antibiotics and analgesics. Seventy-four patients (52.9%) required surgical management. These included; 33 debridement, 30 skin graft, 6 contracture release and 5 amputations. Using bivariate correlation increasing TBSA involved in burns showed strong correlation with the mortality rate in the study ($p= 0.000$). The mortality rate was highest (3.56%) among the 0.5–5-year age group. Though clinically important, age was however found not to be statistically significant in affecting the outcome of the management in the study ($p= 0.220$).

6. DISCUSSION

Mortality and morbidity from burns usually have more incidences among children in low and middle income countries, with children under five years having the highest incidence. (10)

The current study was conducted to reveal the epidemiology and outcome of pediatric burns in Addis Ababa Burn Emergency and trauma hospital – Ethiopia.

The study showed that Children between the ages of 0.5–5 years were shown to be at the greatest risk of sustaining burns (about 72.1% of the study population were between 0.5 & 5 years) in the study making them the most important group at risk and the prime target for prevention. This is similar to findings from previous studies done in Iran, Egypt, Gambia, Nigeria and South Asia. (3, 10, 12, 23, 24) Children in this age group are inquisitive and very active. They tend to either explore or play with most things that they come by. At the same time, they could not appreciate the dangers in the environment. Children require more attention during this period. Access should be strictly controlled and parental surveillance improved especially in environments with dangerous objects. The lay-out of the living environment may also need to be redesigned. Dangerous objects including highly inflammable materials, electricity generating machines and cooking areas should be restricted to areas that must be made inaccessible to children. (12)

There is no significant gender difference in the occurrence of burns in this study. This finding is different from other studies in which males were the most affected gender which was done in Iran, Egypt, Gambia, Nigeria and South Asia. (3, 10, 12, 23, 24)

In this study, scald burn was found to be the predominant cause of burns (about 70% of the burns). Followed by flame burn (17.9%), electrical burn (10.7%) and chemical burn (1.4%). This is similar to the findings from previous studies done in Iran, Egypt, Nigeria and South Asia. (3, 10, 23, 24)

The mean TBSA of the burn injuries found in this study is relatively lower (12.92). Most of the previous studies done in Iran, Egypt and Gambia that were carried out in children had mean TBSA of 15.22%, 15% and 24.74%. (3, 10, 12) This may be due to the etiologic agents that were involved in considerable number of cases in this study.

The mean length of hospital stay (19.03) in this study was more than those of similar studies done in Egypt and Gambia. (10, 12) The mean length of hospital stay is directly related to the types and

extent of wounds as well as the mode of management. The wounds in the present study were more extensive and of mixed thickness. In extensive wounds, surgeries including skin grafting are required. The healing of both donor and recipient sites require time.

Regarding the management outcome, the mortality rate in this study is 5.7%. It is higher than the one found in another studies done in Egypt, Gambia and South Asia. (10, 12, 24) The mortality rate was highest (3.56%) among the 0.5–5-year age group. Though clinically important, age was however found not to be statistically significant in affecting the outcome of management in the study. Increasing TBSA involved in burns showed strong correlation with the mortality rate in the study.

Out of the total studied sample, only three patients were admitted to ICU. The reason for admission being sepsis for all cases. This might be explained by the length of time that has passed before they came for seeking medical care, as most of the patients came from rural area. After admission all of the patients received IV fluid, antibiotics and analgesics. Only seventy-four patients required surgical intervention like debridement, skin graft, contracture release and amputation.

7. STRENGTH AND LIMITATIONS

Strength

The study includes all the pediatric cases except those with incomplete information that were seen in the burn unit in a two-year period.

Limitations

Poor documentation of socio demographic information and risk factors that contribute to burn in the patient's card such as living condition and educational status of the family would have been very important to find out associated factors that contributes to burn.

8. CONCLUSION

Pediatric burn injuries vary across age. The study showed that under five children were more susceptible to burn injuries. Scald and flame type of burn are the most prevalent etiology of burn. Sepsis is the main complication that was encountered as a result of burn injuries and was a cause of the need to ICU admission. The mortality rate increased proportional to the burn size.

A lot is required to improve the level of awareness in the population with regard to the agents that could cause burn. There is also need to educate the parents and guardians on proper surveillance of children and the need to improve the health care facilities by the necessary authorities.

9. RECOMMENDATIONS

With respect to the results obtained from the study recommendations are given to different levels of authorities to decrease the occurrence of burn injuries and its associated morbidity and mortality.

To Addis Ababa burn emergency and trauma hospital burn unit

The early detection of complications associated with burn and aggressive treatment with-out delay using intravenous fluid and potent analgesics is very important. If there is any indication for ICU admission, early consideration will minimize the mortality and morbidity associated with burn.

To Health bureau

Educating the parents especially mothers in the prevention of pediatric burns at home is important part of prevention that could be promoted by the health bureau. In addition to this, intervention programs could be modified according to the cultural features of the target population to be more effective. Further study should be done to see other unexplored associated factors that were not included in this study.

To Woreda and Kebele Health office

As most of the patients arrive at the burn unit lately, early referral to a better setup for the better management of burn should be practiced by the health extension workers at the kebele and woreda level. This will help to minimize the complications and its associated mortality that occur following burn injury.

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ANNEX I: DATA COLLECTION INSTRUMENT

- I. Socio demographic information
 1. Age in year_____
 2. Sex
 - a. Male
 - b. Female
 3. Religion
 - a. Orthodox Christian
 - b. Muslim
 - c. Protestant
 - d. Catholic
 - e. Others
 4. Residence
 - a. Addis Ababa
 - b. Amhara
 - c. Tigray
 - d. Oromia
 - e. Gurage
 - f. Others
- II. Etiology of the burn
 - a. Scald
 - b. Flame
 - c. Flash
 - d. Chemical
 - e. Electrical
- III. Extent of the burn size in percent
- IV. The degree of involvement of the body

- a. First degree
 - b. Second degree
 - c. Third degree
- V. Anatomic distribution of the burn
 - a. Face
 - b. Neck
 - c. Anterior trunk
 - d. Posterior trunk
 - e. Upper limb
 - f. Buttock
 - g. Lower limb
- VI. Was there an ICU admission
 - a. yes
 - b. no
- VII. Reason for ICU admission
 - a. Sepsis
 - b. Respiratory distress
 - c. Acute renal failure
- VIII. Type of treatment received
 - a. IV Fluid
 - b. Analgesics
 - c. Antibiotics
 - d. Surgery (if surgery what kind of surgery)
 - 1. Debridement
 - 2. Skin graft
 - 3. Contracture release
 - 4. Amputation
- IX. Total duration of stay in the burn unit in days
- X. Outcome of the management
 - a. Improved
 - b. Dead