



Plastic Surgery

AN ANALYSIS OF THE CHANGING EPIDEMIOLOGICAL PATTERN OF BURNS IN KILPAUK MEDICAL COLLEGE HOSPITAL

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ABSTRACT Burns are rapidly assuming greater importance as a cause of ill health in the developing nations. The major factors include gross ignorance of fire prevention, the quick spread of slums and the persistence of old traditional customs and beliefs. Delay in bringing the patient to the hospital, ignorance, superstition, old culture and traditional beliefs contributed to the morbidity and mortality. Most of the burn injuries were caused by domestic accidents and were therefore preventable. Keeping this in view, a comprehensive task was undertaken to analyse the changing epidemiological patterns of burns in government Kilpauk Medical College Hospital and also to emphasize on this prevailing social problem which could be prevented by education and proper awareness. Also, the role of campaigning in reducing the incidence of Cracker burns was analysed.

KEYWORDS :

Introduction

Burns constitute a major health problem in India. A very high mortality in major burn was noted two decades ago. However owing to recent advances in fluid and electrolyte maintenance, burns wound care, and to the availability of more specific systemic and topical medications, survival rate has greatly improved in specialized burns centres.

Despite many medical advances, burns continue to remain a challenging problem due to the lack of infrastructure and trained professionals as well as the increased cost of treatment which has an impact on the outcome. Previous epidemiological studies from different parts of India have revealed that burns cases are prevalent all over the country. Many of these patients are poor and hence seek health care from government hospitals. Hence, the present study was undertaken in a burns unit to determine selected epidemiological variables. In addition, we sought to suggest measures to remove myths about pre-hospital burns treatment and provide recommendations to health care professionals.

The burns unit of Government Kilpauk Medical College Hospital is the largest burns unit in Tamil Nadu with highest inpatient record. A study done in this unit will give an in depth insight into the prevailing social problems which could be prevented by proper awareness campaigns, education and also provide further study materials for departments like social and preventive medicine and psychiatry.

The treatment of burns is one of the costliest as it involves expensive antibiotics to control infections and dressings. The treatment is usually prolonged and rehabilitation is lifelong. Hence it involves enormous economic burden to the individual, family, society and the government.

A proper preventive measure could be resourceful. Hence knowledge of the exact etiological reasons could be helpful.

Materials and methods

After obtaining Institutional Ethical Committee approval, a prospective study was carried out over a period of 6 months to analyse 700 consecutive burns cases admitted to a specialized 50 bedded burns unit of a large government teaching hospital in South India. The socio demographic, clinical and in-hospital outcomes of these patients along with a detailed history of causation of burns was done.

In order to perform this work, a format was prepared and was used in every patient. 17 of these items were studied in more detail. The data was obtained by questionnaire and interviews with patient themselves, if they were mature and were able to answer the questions.

The data were also obtained from relatives who attended the patient. Repeated interviews were also performed.

The statistical data of this study was compared with that of the same number of patients in the previous study. The data was obtained from patient records kept at the burns unit. The details of the same items were obtained from these records.

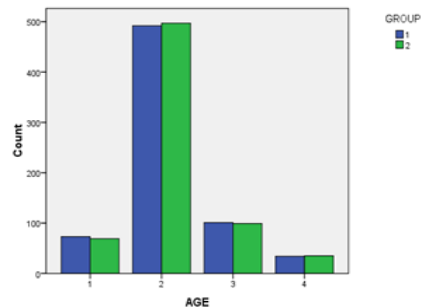
A comparative study was done in these two study groups. The data was entered in a Microsoft Excel spread sheet and analysed.

Results

The importance of the problem is shown by the number of studies. Although the various data are not wholly comparable, owing to different recordings and measuring methods, severity criteria and systems of medical care, we will review a certain number of results.

Age Distribution

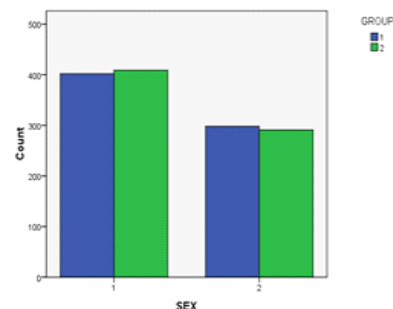
The age distribution was divided into four groups as < 20 years, 21-40 years, 41-60 years and > 60 years. In the study, the peak age incidence was in young adults 21-40 yrs (70.3% of all burns). It was found that there was only a marginal increase of incidence of burns in age group < 20 years when compared to that of previous study. The remaining age groups showed not much significance in variation in incidence.



1. Study Year
2. Previous study

Sex Distribution

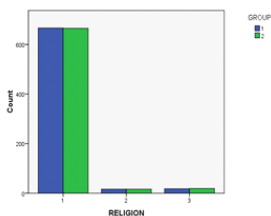
Females still outnumber the males with a percentage of 57.4% of burns patients. Comparing the incidence of male burns of the study with that of the previous study, there was a very slight increase in the number of cases.



1. Study Year
2. Previous study

Religion

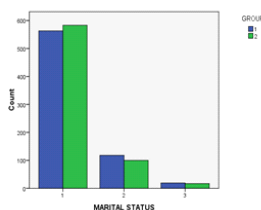
The Hindu population contributed to most of the burns victims (95.1%) This is because the Hindus constitute a very high percentage of the Indian population. The Muslims were slightly more than the Christians because of their social status and education.



1. Study Year
2. Previous study

Marital status

The married group constitutes a very high percentage (80.4%) of burns injury patients. It is observed that marital disharmony is the root cause for several cases of burns. Suicide due to dowry harassment is also a common cause in married females. Inability to cope up with the psychological stress of marriage also leads to self immolation.

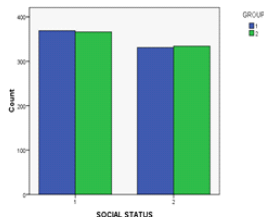


1. Study Year
2. Previous study



Social status

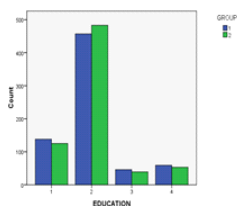
The financially and emotionally dependent group had higher incidence of burns injury (52.7%) than the independent population. Increased stress led to easy emotional breakdown causing an increase in both accidental and suicidal burns injury. The independent group seems to be slightly more stable physically and mentally. But there isn't much significant difference in incidence of burns between the dependent and independent groups.



1. Study Year
2. Previous study

Education

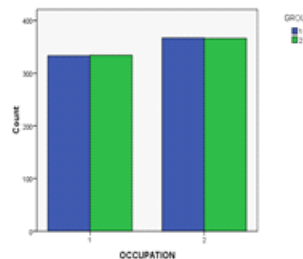
Incidence of burns is more in the partially educated group. People quit schooling and get married at an early age, so the mental maturity among this group is inadequate. They are unable to decide and overcome their social problems. However burns injury is also increasing in the well educated groups of graduates and engineers due to mental imbalance and hasty decisions. The uneducated group is unaware of the safety measures to be taken against burn injury and therefore have a higher risk of accidental burns.



1. Study Year
2. Previous study

Occupation

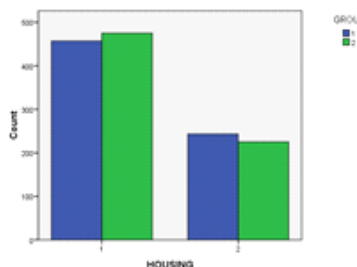
There is no significant difference in the occurrence of burns injury between the employed and unemployed groups. The employed group have more occupational stress and commitments which they find difficult to fulfill. The unemployed group sought to borrowing money from known and unknown people and are unable to repay the debt and are humiliated by the money lenders. Of the working group, more than half of the patients were manual workers, followed by technical workers, clinical, commercial and professional workers.



1. Study Year
2. Previous study

Housing

The urban population constitute the higher percentage of burns injury cases reporting to our hospital. The easy accessibility of the place and ours being the largest burns unit in South India, has a very high number of cases. However the rural population still resort to conventional methods of treatment which resulted in deep burns and contributed to high morbidity and mortality. Many patients and their relatives in this group actually believed that pouring water was harmful to the patients. As burnt patients look is very frightening and catastrophic, patients go to the local practitioners for first aid. When pre hospital treatment was analysed, most of them were given substandard care. It was disappointing to note that doctors too practiced unconventional techniques (fountain pen ink and herbal preparation) as first measures to treat burn victims. As their treatment modalities reflected their suboptimal knowledge of treatment of burns, these doctors require continuing medical education. The study revealed that we need to initiate efforts to educate the public and health professionals regarding first aid for burns and to remove the myths about burn treatment.



1. Study Year
2. Previous Year

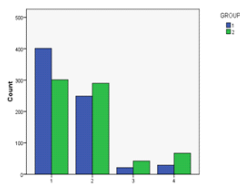
Type Of burns

Analysis of the cause of burns revealed that accidents constituted to 57.3%, suicide was 35.6% and a small percentage contributed to homicide and rescue burns. The number of accidental burns was at a slighter higher percentage than that of previous study. The accidental burns were due to explosion of kerosene stove while cooking, using fire wood, fall in fire walking, falling into an open fire under the influence of alcohol, fire accident in brick and firecracker industries, electrical burns. There was a slight increase in incidence of accidental electrical burns. The awareness of safety measures has to some extent decreased the accidental burns during cooking.

The number of suicidal burns was less compared to accidental burns. Family problems, depression, dowry related causes are usually the reasons for suicidal burns.

The incidence of suicides is always lesser than accidents probably because of reporting of suicides as accidents. Most of the suicide patients give a false history of accidental burns at time of admission. Repeated questioning of them and their relatives reveal the true history

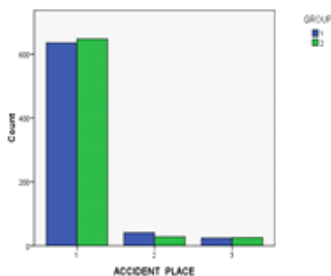
only later. This also contributed to the high increase of accidental burns. The rescue and homicidal burns were decreased compared to that of previous study.



1. Study Year
2. Previous Year

Accident Place

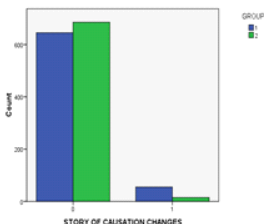
Home was the most common place of majority of burns injury (90.7%). More than half of the domestic cases occurred in kitchen. Cooking was the activity most often responsible for burns occurrence. The next most likely place for burn injury to take place is the workplace, although occupational safety requirements have reduced the risk. Roadways and religious spots are common sites for accidental burn injury due to motor vehicle accidents and fire walking respectively. Burns due to fireworks are common outdoors.



1. Study Year
2. Previous Year

Changes In Story Of Causation

In my study an emphasis was made over the changes in patients version of the cause of burns injury. Repeated interviewing and questioning of the patient and their relatives from the time of admission, throughout their stay in hospital until discharge revealed many changes in the history. 7.9% of people later changed their history. Most of them were females. At the time of admission they give a history of accidental flame burns since most of them are brought to the hospital by their spouse and in-laws. Fearing that their children would not be taken care of by them after their death, they give a false history. But after admission most of them are abandoned by their in laws and their parents come to take care of them. During this treatment period most of them realize the true nature and in-laws and confess the true history of either suicide or homicide. Even in male burns, there is a change in history after admission as most of them are under the influence of alcohol during admission. The study of this aspect of epidemiology has revealed the amount of social stress and stigma within the patients and enable us to counsel them, which would prevent this injury through proper awareness counselling, and education.

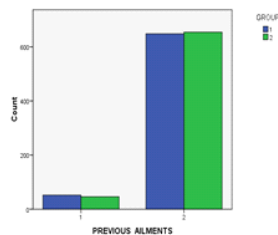


1. Study Year
2. Previous Year

Previous Ailments

In my study a small percentage of 7.4% suffered from medical or surgical ailments. The common among them were diabetes mellitus,

hypertension, ischemic heart disease, bronchial asthma. Few had malignancies and had attempted suicide by self immolation due to intolerable pain. Out of the 52 patients, 22 had psychiatric problems and were undergoing treatment and due to mental instability had attempted burning. 8 patients were known epileptics and had sustained burning injury during the seizure episode. The percentage and degree of burns were more in this group as they had become unconscious immediately after the seizure episode.



1. Study Year
2. Previous Year

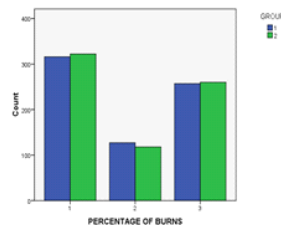
Cause Of Accidents In Males – Predisposing Factors.

Out of the 136 male patients of accidental burns, 65 of them sustained injury during cooking, of which 45 were under the influence of alcohol. The alcoholics, had returned home late in night and had tried to prepare either food, tea or hot water in inebriant state. They had a greater chance of sustaining burns injury.



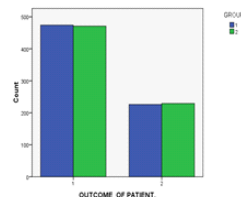
Percentage Of Burns

The percentage of burns were categorized as <40%, 41-60% and >61% of burns. 45.1% of them were in the first group of <40% Total burn surface area, followed by >61% Total burn surface area (36.7%). There was not much significant change in this distribution compared to that of previous study.



1. Study Year
2. Previous Year

Outcome Of Patient



1. Study Year
2. Previous study

Statistics Of Incidence Of Burns In 1 Year.

The analysis showed that in the study year, out of the 1984 admitted patients, 1085 (54.7%) were females, 714 (36%) were males and 185 (9.3%) were children. This when compared with previous study showed a slight increase in the incidence of burns.

Incidence Of Cracker Burns

There was a marked decrease in the incidence of cracker burns in the study year (1.8%) when compared to that of the previous study (8.6%). The main reason was due to increased awareness created about the safety and first aid measures to be taken during cracker burst to the children and parents. This was done through regular school visits and educating the children through videoclips, pamphlets, short plays and demonstrations. Through media the parents were also educated and this proved to be a very effective method to bring down the incidence.



Discussion

Burns is a common injury in the developing world and is associated with significant morbidity and mortality. Understanding the epidemiological aspects and clinical details is helpful to find out the lacunae in burns treatment and the need to improve the same.

In the present study, 700 burns patients were analysed over a period of 6 months and this was compared with the same number of 700 patients in earlier study occupying approximately the same period.

The predominant age group of burn victims was between 20-40 years (70.3%) of age which is consistent with the study of Raja Shanmugakrishnan et al in Madurai.

Analysing the gender ratio, females sustained more burns injury which is in agreement with other authors observations. But of late there is a marginal increase in male burns which is either accidental or suicidal, more often under the influence of alcohol.

The Hindu population had the highest incidence of 95.1%. The married group constituted to 80.4% and the triggering factor for burns was due to inability to cope with the physical and psychological stress of marriage, harassment of inlaws, marital disharmony and dowry harassment which was similar to most of the studies like Shanmugakrishnan et al, Jayaraman V. et al, and Kumar V. et al. The socially dependent group constituted to more than half of the cases. Increased stress and pressure over them as they are financially incapacitated, may be the reason for more number of cases.

It is analysed that literacy plays a less significant role. Many educated people have sought to burning as a mode of suicide. The unemployed group sustained more of accidental flame burns injury as they spend more time at kitchen.

Accidental burns still outnumber the other causes of burns injury. The number of homicidal burns, rescue burns, have decreased when compared to that of earlier study. The high incidence of thermal burns is explained by the use of oil for lamps in villages, substandard kerosene and gas stoves, use of open coal and wood for warmth and cooking, and use of pressure stoves for working in urban area.

The old and unsafe electrical installation in the Indian houses with distributing wires passing overhead and very close to houses, use of crude electric coils for boiling water, unprotected sockets are some of the common causes of electrical burns in this part of the country.

Home still remains the most common place of occurrence of burns. Kerosene stoves contributed to 48% of accidental burns when compared to 2% due to gas stove. As most of the kerosene stoves are of inferior quality the occurrence could be greatly reduced by increasing consumer awareness, enforcing quality standards of stoves or replacing kerosene stoves by gas stoves. Burns in work spot due to industrial accidents were far less. Burns in workspot was either from the brick industry or from cracker industry, showing that the lower strata of work were more hazardous than organized factories.

The change in version of history by the patients during the course of stay in hospital following repeated questioning was 7.9% of patients.

This aspect of study was very useful indicating the amount of pressure the patients underwent following the incident and enabled us to analyse the true history and therefore give proper counselling. It was found that this analysis was not done in any of the previous studies.

Alcoholism has increased the incidence of both accidental and suicidal burns in males. It was found that 16.6% of male burns were under the influence of alcohol.

It was observed that under the influence of alcohol, when men return after work and try to prepare food, or hot water they sustained burns injury. Even when they did not consume alcohol on the day of accident they are prone to get flame burns when they have alcohol dependence.

45.1% of patients had less than 40% Total burns surface area burns and 36.7% had burns >60%. This when compared with the study of Subramanyam M. et al showed that < 40% burns were more common followed by < 60%.

Mortality occurred in relation to body surface area burnt. This seems to be the most significant factor as all patients above 60% Total burns surface area burns died and an overall mortality rate of 67.7% which was much higher than in other studies. The higher mortality in this study may be due to large number of patients presenting with high percentage of Total burns surface area burns ie above 60%. Below 40% Total burns surface area, mortality was 9.2% which was however less compared to other studies. This mortality in our series could be due high turnover of patients, since each room in ward contained many patients which resulted in cross infection and septicemia. Most of such deaths occurred in the second and third weeks. This report indicates that although the majority of patients reported to the hospital within 4 hours post burn, the outcome was almost the same. Even when they are adequately resuscitated immediately after burns, mortality due to cross infection and sepsis could not very much be changed.

In this study when compared to that of earlier study, the change in version of history by the patient was significant. There was a slight increase in male burn and a drastic decrease in cracker burns. There were no significant difference in other items investigated.

Conclusion

Burns is one of the most important public health problems facing both developing and industrialized nations today. Injuries may be either intentional or non-intentional. Intent is sometimes difficult to determine for injuries such as burns as suicides, accidents and homicides produce similar burn pattern. While these burns are mainly preventable it is difficult to see how this can be fully achieved.

Burns represent an extremely stressful experience for both the burns victims as well as their families. An extensive burns profoundly affect the patients physique, psyche, financial situation and family. Patients with extensive burns frequently die, and for those with less injury, physical recovery is slow and painful. In addition to their dramatic physical effects, burns injuries frequently cause deleterious psychological complications.

This study provides a comprehensive overview of the epidemiology of burns patients. The strengths of this study were the prospective nature of the study and comparing the changes in epidemiology with that of previous study, evaluation of individual cases by a single person and follow up of the patients. We did not find much significant difference in epidemiology of patients. This study has also analysed certain new aspects which has not been dealt earlier, like patients giving different versions in history and also the role of predisposing factors in male burns.

Through this study it may be concluded that burns are largely preventable and if properly managed in burns ward, may be treated with high degree of success. Considering the vastness of our country and the fact that facilities for treating burns patients are restricted to a few specialized centres, the problem of burns in India still remains. The high incidence of burns could be reduced by proper education of people regarding common causes of burns and their prevention. Television, movies may be used as a tool to counsel people about fire safety.

Burn injury not only takes a toll on the patients body, but other costs are involved as well as work time cost, the cost for rehabilitation, employers compensation for time off work and the excessive need for

family support both emotionally and physically to care for the patients until recovery.

Prevention is more cost effective than treatment. Good and effective burn care does not necessarily imply expensive burn care.

The approach to prevention may be accomplished by education and awareness campaigns in high risk groups (ie) house wives, children, elderly. Passing legislation for peoples' safe guards in household appliances, legislation for electricity theft, use of less inflammable garments may be useful.

Preventive programmes need to be set up immediately in order to reduce the risk of burn injuries. Parents must be educated as to the risks involved at home and especially in kitchen. We would also like to see workers and their employees being more aware of the risk of burn injury. Protective clothing should be made available and laws regarding its proper use enforced. Workers should not be required to expose themselves to unnecessary risks.

Finally we would like to see programmes set up to emphasize the damages presented by fireworks. The existing laws that were designed to minimize the risk involved in their manufacture and handling, need to be reinforced.

Contact with the health education authorities have been made regarding the implementation of preventive programmes.

We also propose that a further similar study should be carried out after such programmes have been running for a significant length of time in order to assess the effectiveness of programmes on the number of admissions.

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