Section: FSM & FMT

Original Research Article

AN ORIGINAL RESEARCH PAPER ON DEMOGRAPHIC PROFILE OF FATAL BURN CASES - AN AUTOPSY BASED CROSS-SECTIONAL STUDY DONE IN MEDICAL COLLEGE OF WEST BENGAL

Amrita Ghosal[1], Pranabesh Bharatee[2], Shibsankar Mahata[3], Aniruddha Das[4], Suchandra Pramanik[5], Balla Bhargavi[6]

[1,5,6]*Junior Resident, Department of FSM, Burdwan Medical College and Hospital, Purba Bardhaman, West Bengal, India.*
[2]*Associate Professor, Department FMT, Maharaja Jitendra Narayan Medical College and Hospital, Cooch Behar, West Bengal, India.*
[3]*Assistant Professor, Department FMT, Jhargram Government Medical College and Hospital, Jhargram, West Bengal, India.*
[4]*Associate Professor, Department of FSM, Burdwan Medical College and Hospital, Purba Bardhaman, West Bengal, India.*

Received *: 09/01/2026*
Received in revised form *: 24/02/2026*
Accepted *: 11/03/2026*

Corresponding Author:
Dr. Aniruddha Das,
Associate Professor, Department of FSM, Burdwan Medical College and Hospital, Purba Bardhaman, West Bengal, India.
Email: fmtdrani1982@gmail.com

DOI: 10.70034/ijmedph.2026.1.455

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (1); 2640-2648

ABSTRACT

Background: Burn wounds are old-age global public health issue, which directly affects morbidity and mortality. India almost have a yearly incidence of 6-7 million burn cases. The American Burn Association has classified fatal burn cases into three risk groups which are as follows:- Low-risk, High Risk and Poor Risk. Wilson has classified the burn in 3 groups:- Epidermal, Dermo-Epidermal and Deep Burn. Detailed post-mortem examination in fatal burn cases not only provides valuable evidence but also the demographic profile helps a lot to formulate proper precaution to avoid burn related casualty. In this original research paper, an attempt has been made to get an over-view over the demographic profile to pin-point the vulnerable group.

Materials and Methods: After getting institutional ethical committee clearance, the study was conducted over the 55 dead-bodies died due to fatal burn wounds being selected, screened through the inclusion and exclusion criteria.

Results: In the current study, most of the victims were found aged in the 21–30 years age range (29.1%), highlighting that burns primarily impact young adults during their peak years. Females found to be made up of 87.3%, with a female-to-male ratio of 6.8:1, highlighting gender vulnerability related to domestic fire incidents and most importantly age and gender distribution were not statistically significantly associated with burn severity.

Conclusion: This study can be deemed as a pilot study on which the pivot of larger further study can rest. This current study has multiple limitations like limited sample size, bias of a single centre based study. But even after that, the study aimed to be precisely flawless as possible.

Keywords: Fatal, Burn, Demography, Profile, Cross-sectional, Autopsy

INTRODUCTION

Burn injuries are a significant global public health issue, greatly affecting morbidity and mortality. Beyond the immediate effects of burn trauma, complications from extensive burns can cause multi-organ failure and lead to death. While the main focus is often on assessing and treating skin injuries, the potential for liver damage from severe burns has become more recognized. India has an annual burn incidence of 6-7 million. The data is collected from the major hospitals of the country. Burn is the second largest injury after road traffic accidents in India. Almost 10% of them are life-threatening, and these cases require hospitalization. Nearly 50% of those hospitalized succumb to their injuries. Approximately 1-1.5 lakh people suffering from burn injuries require multiple surgeries and prolonged rehabilitation. 70% of the victims are from the age

group of 15 - 40 years, and the majority of them are from poor socioeconomic conditions.[1]

Approximately 22% of all patients with burn injuries who visit emergency rooms are admitted to burn units 2. Worldwide, there are between 0.2 and 2.9 cases of serious burn injuries per 10,000 people each year. The burn profile closely reflects a nation's socioeconomic fluctuation. The causes of the sharp decline in burn incidence are that economically developed nations with effective preventative policies, well-organized housing, and safe cooking and fuel technologies. However, because of the prevalence of hazardous stoves and fuels, as well as the size of slums, burns are still a common occurrence in poor countries. South East Asia continues to account for more than half of all fire-related fatalities. with women accounting for two-thirds of the fatalities. This region has the highest global death rate for females. African children under the age of fifteen, European men in low- and middle-income nations, and women in the eastern Mediterranean region also have statistically higher rates of burn injury-related deaths.[3]

According to a study conducted at an Apex medical center in North India, the burn death rate is 23.3%. Women made up 80.8% of all burn deaths, and 82.4% of them were married. 75% of them were from rural areas, and 71.9% of them were between the ages of 21 and 40. Regarding the cause of death, 1.5% were homicidal, 47.8% were suicidal, and 50.7% were accidental. The most frequent cause of burn suicide among married women (32.1%) was torture by in-laws. According to a Shanmugakrishnan study on South India, 57.33% of deaths were caused by burns 4. Males made up 41.3% and females made up 58.7% of the admitted victims. A considerable proportion of women in the 15–24 age group (40.9%) and men in the 25–45 age group (37%) experienced burns. Of the admissions, incidental burn injuries accounted for 4.8%, suicide for 24.3%, homicidal for 7.8%, and accidental for 43.6%. Seventy-two percent of the female suicidal burns were caused by family issues, twenty-four percent by despair, and four percent by dowry-related factors.

The burn death rate in Subrahmanyam, Western India, was 56.5%, which was comparable to the rate in southern India.[5] Of the victims, 43% were men and 57% were women. Of the patients, 79.4% were between the ages of 11 and 42. 79.4% of instances were unintentional, and 47.4% involved married women.

According to a study by Ghaffar et al., the overall burn-related mortality rate in Central India was 26%, with females experiencing a greater rate of 67.6% than males (32.4%) 6. The majority of people (68.4%) lived in rural areas, and the greatest age group was between 13 and 25 years old (41.5%). In this case, 75.8% of burns were unintentional, and 82.7% of the women were married.

According to Chakraborty et al.'s study, the burn fatality rate in West Bengal, India's eastern region, was 23.5% 7. 56.6% of the population was between the ages of 20 and 39, 57.8% was from rural areas, and 61.5% of the population was female. Married women made up 36.1% of the victims. 18.1% of burns were suicidal, 20.5% were homicidal, and 61.4% were accidental. Social conflicts accounted for the highest percentage of homicidal burns (35.3%), followed by dowry fatalities (29.4%). The primary reason for suicide attempts (66.7%) was domestic conflict, which was followed by mental depression (20%). The seasons with the highest rates of burns are winter (33.6%), autumn (25.6%), spring, and summer (19.6%). According to a few studies, burns are more common on weekends and during the gloomy winter months. The third most common cause of fatal home injuries is burn injuries brought on by fire. Even though the number of home fire-related deaths and injuries has significantly decreased over the past few decades, many of these deaths are still avoidable and continue to be a serious public health concern. Although they occur globally, burns are a little more frequent in rural areas. The main reason for home fires is cooking. The most frequent cause of cooking-related flame burns is still poorly constructed kerosene stoves. The widespread use of kerosene lamps for lighting, which frequently fall and spill petroleum, is another major factor contributing to home burns. This is due to the small power supply8. Rural women typically wear saris, which are constructed of a highly flammable polyester blend cloth. A flimsy cotton sari can catch fire just as easily. Without the wearer's knowledge, this flowing robe suddenly catches fire from behind. After that, there is a panic attack as the victim flees for assistance, which fuels the fire even more and raises the total number of residential burns. The public's glaring misunderstanding of the proper way to handle a burning person leads to panic reactionsAccording to age and health, the American Burn Association has classified people into three risk groups 9, which include:

- Low-Risk Patients: those in the 10–50 age range
- Patients at higher risk: those under 10 or older than 50
- Patients at Poor Risk: those with underlying illnesses such as diabetes, lung disease, and heart disease.

In the year 1947, Jackson stated three zones of burn as the local reactions10. These zones are the following:

The core of the burn, or the site of maximal injury, is where the zone of coagulation is found. This is because the coagulation of constituent proteins causes irreversible tissue loss.

Stasis/ischemia zone: The zone of stasis is the area right next to the zone of coagulation. Reduced tissue perfusion is the defining feature of this zone. It may be possible to salvage the tissue in this area. Increasing tissue perfusion in the affected area and halting the damage from becoming irreparable are the primary goals of resuscitating a burn patient.

Additional insults like as oedema, infection, or chronic hypotension might cause this zone to completely lose tissue. The loss of tissue in this area will cause the incision to both spread and deepen.

The outermost of the three zones is the zone of hyperaemia. Unless there is severe sepsis or persistent hypoperfusion, the tissue here will always recover.

As soon as a burn injury occurs, the inflammatory process begins. However, systemic reactions develop over time, typically reaching their peak five to seven days after the injury. Inflammatory mediators are responsible for much of the local and most systemic changes. As a result, the damaged tissue enters a hyperdynamic and hypermetabolic state caused by inflammation, which can lead to serious, gradual damage to distant organs.

Classification of the degree of burn

Different scientists have different classifications for burns. Depending on the type of severity, Dupuytren had divided burns into six degrees.

- First degree: results in erythema and temporary portion swelling, which is followed by desquamation of the epidermis' outermost layers.
- Second degree: causes blister development and vesication.
- Third degree: results in the skin being partially destroyed.
- Fourth degree: destroys the true skin.
- Fifth degree: results in the breakdown of deep fascia, muscle tissue, and subcutaneous tissue.
- Sixth degree: will affect deeper tissues, such as bones, nerve trunks, and large blood vessels.

Wilson had classified burns into three degrees.

- Epidermal: includes Dupuytren's first and second degrees.
- Dermo-epidermal: includes Dupuytren's third and fourth degrees
- The fifth and sixth degrees of Dupuytren are included in deep burns.

According to Wilson's classification, epidermal burns can be brought on by the temporary application of hot materials or dry heat flame, as well as occasionally by irritants and vesicants like cantharides. The afflicted area displays a patch of erythema, or skin redness, that goes away when pressure is applied and may or may not result in blister formation. Within a few hours, the skin returns to its usual state, and the redness and swelling go away. Sometimes it takes a few days for the cuticle to desquamate without leaving any scars. In addition to erythema, a blister with albuminous fluid concealed by whitened avascular epidermis and encircled by a zone of hyperemia may form here between the cuticle and cutis vera. Small blisters that are no more than half an inch in diameter often go away by absorbing fluid, and the elevated, dead epidermis eventually falls off to be replaced by fresh growth from the burn's surrounding area without leaving any scars. When the blisters get infected, they may become ulcerated and could cause toxemia. Even though they are superficial, first-degree burns hurt a lot.

Channabasappa SR et al,[11] (2019) observed that medico-legal deaths, including burns, claim a substantial number of lives in Andaman & Nicobar Islands. 'A Cross-sectional Study of Pathological changes in Lungs, Liver and Kidneys in Burns Cases' was carried out at the Department of Forensic Medicine & Toxicology, G B Pant hospital, ANIIMS, Port Blair, A & N Islands. Material & methods: The present study was carried out for the period of 3 years from January 2015 to December 2017. Totally 100 cases with burns and scald injuries brought to the mortuary for autopsy were the material for study and collection of tissues for histopathological examination. Results: In the present study, histopathological changes in lungs showed congestion, pulmonary edema, emphysematous changes, bronchopneumonia, interstitial pneumonitis, anthracotic pigment, and carbon-laden macrophages. In some of the cases, intravascular thrombi, septic emboli, interstitial & intra-alveolar haemorrhage were also observed. Diffuse alveolar damage or ARDS was observed in the majority of the cases. Histopathological changes in the liver showed congestion, fatty change, centrilobular necrosis, cloudy swelling, focal haemorrhage, necrosis portal inflammation. Histopathological changes in the kidneys showed ATN in the majority of cases, cloud degeneration, congestion, tubular casts, and acute pyelonephritis in the rest of the cases. Conclusion: The effect of burns on vital organs can be assessed through histopathological examination, which helps us to determine the post-burn complications and helps in the treatment of the victim in the future.

Awan EA et al,[12] (2020) found that the second leading cause of accidental injuries is burns. Burn injuries involve multiple organs. The most common causes of death among these patients are multi-organ failure and sepsis. Results: On autopsy of patients who died due to burn related complications 41(36.2%) had normal liver histology, 47(41.5%) had sinusoidal dilation and congestion, 7(6%) had fatty liver, 7(6%) had hemorrhage while 11(9.7%) had necrosis. On autopsy of kidney, 37(32.7%) had normal histologic findings, 42(37%) had cellular swelling and congestion whereas 34(30%) had tubular necrosis. **Conclusion:** The management of patients with adequate fluid replacement, antibiotics to prevent infection, dietary modifications which involve replacing the lost protein and graded resistance exercises can improve the management of these patients Keywords: Burn injuries, Histopathologic changes, Liver, Kidney.

Abdullahi A et al,[13] (2019) found that burn patients experiencing hypermetabolism develop hepatic steatosis, which is associated with liver failure and poor outcomes after the injury. These same patients also undergo white adipose tissue (WAT) browning, which has been implicated in mediating post-burn cachexia and sustained hypermetabolism. Despite the clinical presentation of hepatic steatosis and WAT

browning in burns, whether or not these two pathological responses are linked remains poorly understood. Here, we show that the burn-induced WAT browning and its associated increased lipolysis lead to the accelerated development of hepatic steatosis in mice. Deletion of interleukin 6 (IL-6) and the uncoupling protein 1 (UCP1), regulators of burn-induced WAT browning, completely protected mice from hepatic steatosis after the injury. Treatment of post-burn mice with propranolol or IL-6 receptor blocker attenuated burn-induced WAT browning and its associated hepatic steatosis pathology. Lipidomic profiling in the plasma of post-burn mice and burn patients revealed elevated levels of damage-inducing lipids (palmitic and stearic acids), which induced hepatic endoplasmic reticulum (ER) stress and compromised hepatic fat oxidation. Mechanistically, we show that hepatic ER stress after a burn injury leads to a greater ER-mitochondria interaction, hepatocyte apoptosis, oxidative stress, and impaired fat oxidation. Collectively, our findings uncover an adverse "cross-talk" between the adipose and liver tissue in the context of burn injury, which is critically mediated by WAT browning.

Talewad SS et al,[14] (2019) observed that Thermal burns are common next only to road traffic accidents in India. On average, 1/4th of the deaths are due to burns in all postmortem examinations conducted. Mortality rate due to burns in India is much higher than in any other developed country. Every year, more than 2 million people sustain burns in India, most of which are treated as outdoor patients. About 2,00,000 are admitted to hospitals and 5,000 die. The major cause of death in burn patients includes multiple organ failure and infection. This can be understood better with a pathological study of the victim's organs. Hence, this study has been an effort to identify the pathological changes in various organs of burn victims. The present study was carried out in the Department of Forensic Medicine & Toxicology, S N Medical College, Bagalkot, for one year from 1-1-2012 to 31-12-2012. A total of 48 cases with burn injuries brought to the mortuary for autopsy were studied. Tissues for histopathological examination were collected. From the present study, it was observed that on histopathological examination, congestion was the most common finding in the lungs and liver. In the kidneys, almost 1/3rd of the cases exhibited acute tubular necrosis. Curling's ulcer was seen in only one victim. The suprarenal gland, stomach, brain, and kidneys were unaffected in the majority of cases.

Das A et al,[15] (2021) observed that Burn injury causes significant fatality every year with its immediate effect or complications. This is 6th most frequent cause of unnatural death & 3rd most frequent cause of suicidal death. Organ-specific pathology has been studied a lot, but pancreatic pathology has been missed and overlooked over the years. This prospective, observational, cross-sectional study was aimed to find out gross & microscopic histopathology changes of pancreas in burn cases & to correlate the pathological findings with the duration of survival after receiving burn injury and total body surface area bunt (TBSA). It was done on medico-legal autopsy cases with burn injury over 4 months. All cases irrespective of gender and age were included except decomposed bodies. The survival period was noted from available documents and TBSA calculated using 'Rule of nine'. Pancreatic specimen retrieved and preserved in 10% formalin solution, processed & examined macro & microscopically. Total 13 cases (9 female, 4 male) aged between 19 to 38 years examined while survival period varied from 7 hours to 429.5 hours & TBSA varied from 44.5% to 93.5%. Patchy area of blackish discoloration found in 3 cases macroscopically. Microscopically- pancreatic oedema, congestion was most consistent finding, hemorrhage being inconsistent & necrosis rarest along with various other significant findings suggestive of severe pancreatic inflammation. Extensive study with larger sample size and extensive recruitment of samples can yield significant evidence in future. Burn causes the injuries over the body. It is due to application of heat or chemical substances to the external or internal surfaces of the body. It causes destruction of the tissues, which produces histopathological changes in the tissues. It is very important to know the profile of histopathological changes in organs, commonest organ involved, and correlation of duration of burns to decide the further mode of treatment. In the wake of this, it was decided to conduct prospective study of histopathological changes in the vital organs of death due to burns at Vilasrao Deshmukh government medical college, Later, Maharashtra. Total 100 cases were selected for the histopathological study of vital organs i.e. lungs, liver, kidneys, brain and heart.

MATERIALS AND METHODS

After getting IEC approval (Vide Memo No.:- BMC/I.E.C./048 dt 11/03/2024), this descriptive observational cross-sectional study was conducted in Burdwan Police Morgue, Department of Forensic Medicine and Toxicology, Burdwan Medical College & Hospital from April 2024 to November 2025 using complete enumeration methods following Exclusion criteria : (1) Decomposed body (2) Unidentified body (3) Charred body. Total 55 dead bodies were included in the current study.

RESULTS

Table 1: Age Distribution of the Study Participants

Age in Group	Frequency	Percent
<10	2	3.6
11-20	4	7.3
21-30	16	29.1
31-40	15	27.3
41-50	6	10.9
51-60	1	1.8
61-70	4	7.3
71-80	5	9.1
>81	2	3.6
Total	55	100.0

In our study, most cases occurred in the 21–30-year age group with 16 patients (29.1%), followed closely by the 31–40-year group with 15 patients (27.3%). Other age groups included 6 patients (10.9%) aged 41–50, 5 patients (9.1%) in the 71–80-year range, 4 patients (7.3%) each in the 11–20 and 61–70-year groups, 2 patients (3.6%) both under 10 years and over 81 years, and only 1 patient (1.8%) in the 51–60-year group.

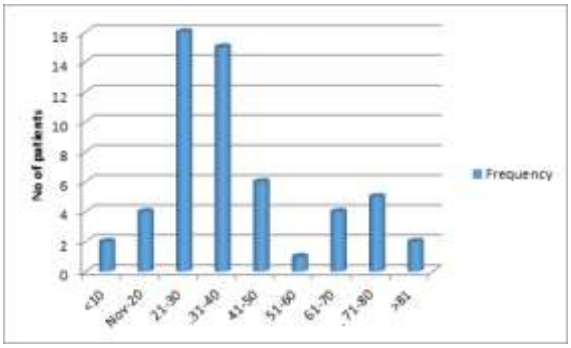

Figure 1: Bar diagram showing age distribution of the study participants

Table 2: Distribution of Sex

Sex	Frequency	Percent
Female	48	87.3
Male	7	12.7
Total	55	100.0

In our study, most patients were female, accounting for 48 cases (87.3%), while males made up only 7 cases (12.7%).

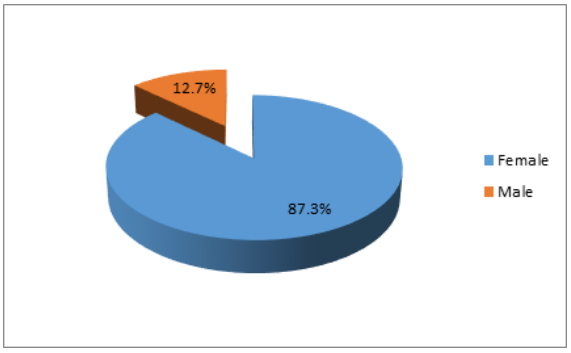

Figure 2: Pie chart showing sex distribution among study participants

Table 3: Distribution of Degree of Burn

Degree of Burn	Frequency	Percent
Deep burn	7	12.7
Dermo-epidermal	14	25.5
Infected burn (degree of burn not applicable)	34	61.8
Total	55	100.0

In our study, 7 patients (12.7%) had deep burns, while 14 patients (25.5%) experienced dermo-epidermal burns. The largest group was infected burns (degree of burn not applicable) of 34 patients (61.8%).

Correlation between duration of Age at the Time of Burn Incident and Total Body Surface Area (TBSA) Affected % and Time Elapsed Since Burn Incident (Hr.) and Postmortem Examination postmortem interval (Hrs.). Figure 3]

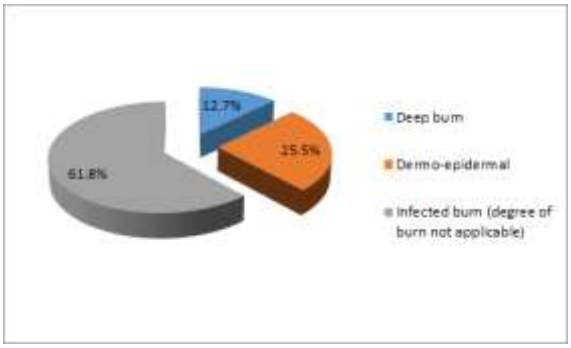

Figure 3: Pie chart showing distribution of the degree of burn among study participants

Table 4: Distribution of mean Report

Report	Age at the Time of Burn Incident	Total Body Surface Area (TBSA) Affected %	Time Elapsed Since Burn Incident(Hr.)	Postmortem Examination postmortem interval (Hrs.)
N	55	55	55	55
Mean	39.09	53.9091%	132.89	7.95
Std. Deviation	20.063	15.69504%	148.423	6.163
Maximum	85	85.00%	523	23
Minimum	5	26.00%	15	3
Median	35.00	54.5000%	86.00	5.00

In this study, which included 55 autopsy cases of fatal burn injuries, the average age of the victims at the time of the burn was 39.09 ± 20.06 years, ranging from 5 to 85 years (median: 35 years). The average total body surface area (TBSA) affected was 53.91% ± 15.70%, with a range of 26% to 85% (median: 54.5%). The time from burn incident to death varied widely, with an average of 132.89 ± 148.42 hours (range: 15–523 hours; median: 86 hours). The postmortem interval at the time of examination ranged from 3 to 23 hours, averaging 7.95 ± 6.16 hours (median: 5 hours). These findings highlight the diversity in demographic profiles, extent of burn injuries, survival times, and timing of autopsy among the cases studied.

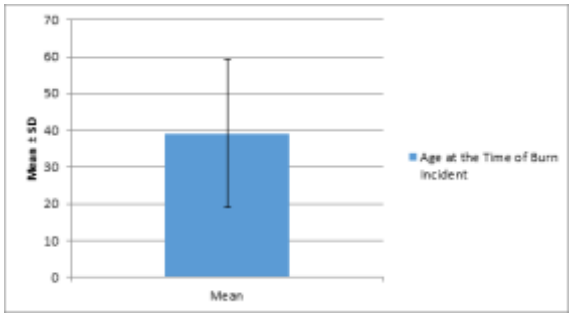

Figure 4: Bar diagram showing the age at the time of the burn incident among study participants

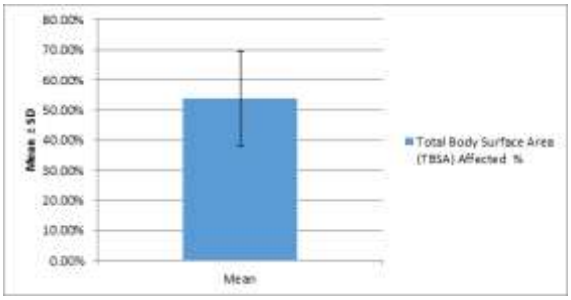

Figure 5: Bar diagram showing the distribution of the Percentage of Total body surface area (TBSA) affected among study participants

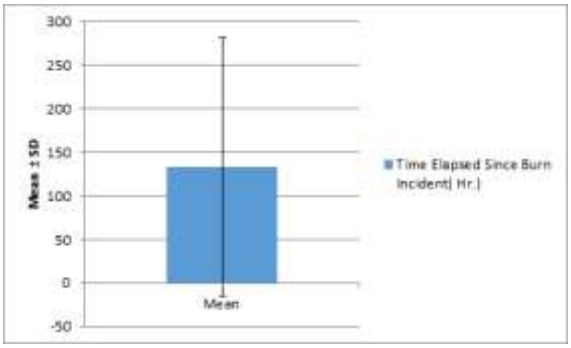

Figure 6: Bar diagram showing the time elapsed since the burn incident among study participants

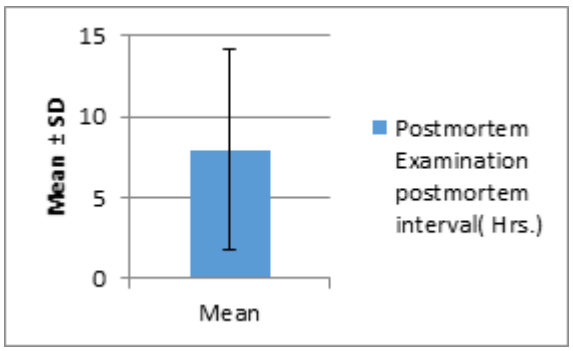

Figure 7: Bar diagram showing the postmortem examination postmortem interval among study participants

Table 5: Association between Age Group and Degree of Burn

			Degree of Burn			Total
			Deep burn	Dermo-epidermal	Infected burn (degree of burn not applicable)	
Age in Group	<10	Count	1	1	0	2
		% within Age in Group	50.0%	50.0%	0.0%	100.0%
		% within Degree of Burn	14.3%	7.1%	0.0%	3.6%
	11-20	Count	2	1	1	4
		% within Age in Group	50.0%	25.0%	25.0%	100.0%
		% within Degree of Burn	28.6%	7.1%	2.9%	7.3%
	21-30	Count	1	3	12	16
		% within Age in Group	6.2%	18.8%	75.0%	100.0%
		% within Degree of Burn	14.3%	21.4%	35.3%	29.1%
	31-40	Count	2	3	10	15
		% within Age in Group	13.3%	20.0%	66.7%	100.0%
		% within Degree of Burn	28.6%	21.4%	29.4%	27.3%
	41-50	Count	0	2	4	6
		% within Age in Group	0.0%	33.3%	66.7%	100.0%
		% within Degree of Burn	0.0%	14.3%	11.8%	10.9%
	51-60	Count	0	1	0	1
		% within Age in Group	0.0%	100.0%	0.0%	100.0%
		% within Degree of Burn	0.0%	7.1%	0.0%	1.8%
	61-70	Count	0	0	4	4
		% within Age in Group	0.0%	0.0%	100.0%	100.0%
		% within Degree of Burn	0.0%	0.0%	11.8%	7.3%
	71-80	Count	0	3	2	5
		% within Age in Group	0.0%	60.0%	40.0%	100.0%
		% within Degree of Burn	0.0%	21.4%	5.9%	9.1%
	>81	Count	1	0	1	2
		% within Age in Group	50.0%	0.0%	50.0%	100.0%
		% within Degree of Burn	14.3%	0.0%	2.9%	3.6%
Total		Count	7	14	34	55
		% within Age in Group	12.7%	25.5%	61.8%	100.0%
		% within Degree of Burn	100.0%	100.0%	100.0%	100.0%
P Value		.112				
Chi square		23.068[a]				

In our study, deep burns were observed in seven patients, with the highest percentages seen in the 11–20 years and 31–40 years groups (two cases each, 28.6%). One case each (14.3%) was found in the 21–30 years and >81 years groups. Dermo-epidermal burns were recorded in 14 patients, most frequently in the 21–30 years, 31–40 years, and 71–80 years groups (three cases each, 21.4%). Smaller numbers were seen in the 41–50 years group (two cases, 14.3%) and in the 51–60 years, 11–20 years, and <10 years groups (one case each, 7.1%).

Infected burns, for which the degree was not specified, made up the largest category, affecting 34 patients. These cases mainly occurred in the 21–30 years (12 cases, 35.3%) and 31–40 years (10 cases, 29.4%) groups. Additional cases were found in the 41–50 years and 61–70 years groups, with four cases each (11.8%), followed by the 71–80 years group with two cases (5.9%), and the 11–20 years and >81 years groups, each with one case (2.9%). Overall, infected burns are more common among younger adults, especially those between 21 and 40 years old. Although differences were seen among age groups, the link between age and burn severity was not statistically significant ($\chi^2 = 23.068$, $p = 0.112$).

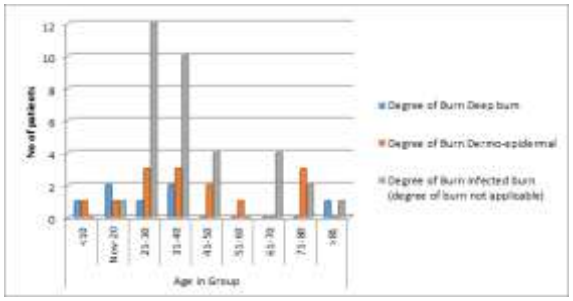

Figure: 8 Bar diagram showing the association between age group and degree of burn among study participants

Table 6: Association between Sex and Degree of Burn

			Degree of Burn			Total
			Deep burn	Dermo-epidermal	Infected burn (degree of burn not applicable)	
Sex	Female	Count	6	10	32	48
		% within Sex	12.5%	20.8%	66.7%	100.0%
		% within Degree of Burn	85.7%	71.4%	94.1%	87.3%
	Male	Count	1	4	2	7
		% within Sex	14.3%	57.1%	28.6%	100.0%
		% within Degree of Burn	14.3%	28.6%	5.9%	12.7%
Total		Count	7	14	34	55
		% within Sex	12.7%	25.5%	61.8%	100.0%
		% within Degree of Burn	100.0%	100.0%	100.0%	100.0%
P Value		.100				
Chi square		4.614[a]				

This study presents deep burns in seven patients, six of whom (85.7%) were women and one (14.3%) was a man. Dermo-epidermal burns were present in fourteen cases, including ten women (71.4%) and four men (28.6%). Infected burns, for which the burn degree could not be determined, comprised the largest category with 34 cases; this group was mainly women (n = 32, 94.1%) with only two men (5.9%).

Although females comprised the majority of the overall study population (87.3%), the comparison between sex and the severity of burn injuries did not reveal a statistically significant relationship (χ^2 = 4.614, p = 0.100). Therefore, within this sample, the severity or type of burn injury was not significantly influenced by the patient's sex.

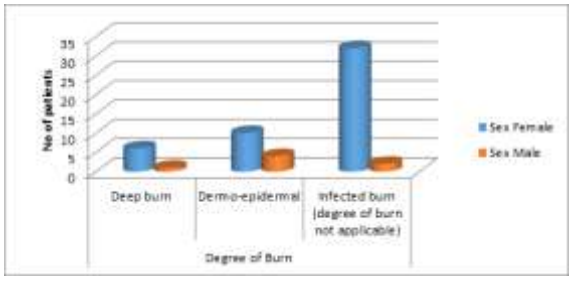

Figure 9: Bar diagram showing the Association between Sex and Degree of Burn among study participants

DISCUSSION

In our study, out of 55 patients most of the patients were 21-30 years old [16 (29.1%)] but this was not statistically significant (p=0.112). In similar study by Jayker SS et al (2022) observed that the age ranged from infant to 78 years and Singh D et al (2023) observed that the mean age of the cases was 41.98 ± 15.39 years, and ages ranged from 20 to 90 years.

We found that, female population was higher [48 (87.3%)] than the male population [7 (12.7%)]. Female: Male ratio was 6.8:1 but this was not statistically significant (p=.100). In similar study by Jayker SS et al (2022) observed that males (67.9%) were commonly affected with male: female ratio of 2.1:1 and Das A et al (2021) observed that total 13 cases (9 female, 4 male).

In our study, blister formation was observed in 6 patients (85.7%) in the deep burn group, compared to 7 patients (50.0%) in the dermo-epidermal group. The difference was statistically significant (p < 0.0001).

We found that the mean Age at the Time of Burn Incident at the time of burn incident was 40.57 ± 22.52 years in the dermo-epidermal group, 40.03 ± 18.19 years in the infected burn group, and 31.57 ± 25.05 years in the deep burn group. It was not statistically significant (p = 0.576). In similar study by Jayker SS et al (2022) 16 observed that the age ranged from infant to 78 years and Singh D et al (2023) 17 observed that the mean age of the cases was 41.98 ± 15.39 years, and ages ranged from 20 to 90 years.

We showed that the mean Total Body Surface Area (TBSA) Affected % was 74.43 ± 13.21% in the deep burn group, 55.96 ± 9.87% in the dermo-epidermal group, and 48.84 ± 14.68% in the infected burn group. It was found to be statistically highly significant (p < 0.0001). In similar study by Das A et

al (2021) observed that TBSA varied from 44.5% to 93.5%.

We observed that the mean Time Elapsed Since Burn Incident (Hr.) was 195.50 ± 159.33 hours in the infected burn group, 34.50 ± 11.86 hours in the dermo-epidermal group, and 25.57 ± 9.73 hours in the deep burn group. It was statistically highly significant ($p < 0.0001$).

We showed that the mean Postmortem Examination postmortem interval (Hrs.) was 10.00 ± 7.07 hours in the infected burn group, 4.79 ± 1.12 hours in the dermo-epidermal group, and 4.29 ± 1.25 hours in the deep burn group. It was statistically highly significant ($p < 0.0001$).

CONCLUSION

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for profit sectors.

Acknowledgment

We are sincerely thankful and grateful from core of our heart to the whole Department of FMT of Burdwan Medical College specially to Dr. Joydeep Khan and Dr. Surya. Our most sincere thanks goes to Prof (Dr.) Partha Sarathi Hembram, HOD of the Department of FSM, Burdwan Medical College for acting as the master of this orchestra.

Conflict of Interest

The authors declare that there is no conflict of interest. This research work is a part of the Dissertation of the First Author, submitted at the West Bengal University of Health Sciences in compliance with partial fulfilment of eligibility for the MD Examination for the year 2026.

REFERENCES

1. Brunucardi FC, Andersen DK, Billiar TR, Dunn DL, Hunter JG, Raphael EP. Burns. In: Schwartz's Principles of Surgery. 8th ed. New York: McGraw Hill Medical Publishing Division; 2005. p. 189–222.
2. Brusselaers N, Monstrey S, Vogelaers D. Severe burn injury in Europe: a systematic review of incidence, etiology, morbidity and mortality. Crit Care. 2010;14: R188.
3. William MH, Melanie FA, Raymond SA. Incidence of burns in Asia. In: William MH, Melanie FA, Raymond SA, editors. Understanding Global Health.
4. Shanmugakrishnan RR, Narayanan V, Thirumalaikolundusubramanian P. Epidemiology of burns in a teaching hospital in South India. Indian J Plast Surg. 2008;41(1):34–7.
5. Subrahmanyam M. Epidemiology of burns in a district hospital in Western India. Burns. 1996 Sep;22(6):439–42.
6. Ghaffar UB, Husain M, Rizvi SJ. Thermal burn: an epidemiological prospective study. J Indian Acad Forensic Med. 2009;30(1):10–14.
7. Chakraborty S, Bisoi S, Chattopadhyay D, Mishra R, Bhattacharya N, Biswas B. A study on demographic and clinical profile of burn patients in an apex institute of West Bengal. Indian J Public Health. 2010;54(1):27–9.
8. Chamania S. Training and burn care in rural India. Indian J Plast Surg. 2010;43(3):126–30.
9. Stephen SJ, John BH, Gettings SD. Is Your Hand Burn Serious? 2010;
10. Hettiaratchy S, Dziewulski P. Pathophysiology and types of burns. BMJ. 2004 Jun 10;328(7453):1427–9.
11. Awan EA, Aslam N, Rahim AU. Histopathologic Changes in Liver and Kidney in Cases of Deaths due to Burn Injuries. Pakistan Journal of Medical and Health Sciences. 2020;14(2):558-60.
12. Malik AK, Khanna K, Dhattarwal SK, Gill M. Histopathological evaluation of burn injury. INTERNATIONAL JOURNAL OF ETHICS, TRAUMA & VICTIMOLOGY. 2021 Dec 25;7(01):5-10.
13. Abdullahi A, Samadi O, Auger C, Kanagalingam T, Boehning D, Bi S, Jeschke MG. Browning of white adipose tissue after a burn injury promotes hepatic steatosis and dysfunction. Cell death & disease. 2019 Nov 18;10(12):870
14. Talewad N, Kaur G, Singh S. Histopathologic findings in liver on autopsy of patients died due to burn. Pak J Med Sci. 2020;36(3):558-561.
15. Das A, Das N, Chakraborty A, Bhattacharya S, Jain BB, Sukul B. Histopathological changes in pancreas in cases of death due to burn injuries-A pilot study on postmortem histopathology. Journal of Indian Academy of Forensic Medicine. 2021 Mar;43(1):37-41
16. Jayker SS, Raju K, Papireddy SR. Spectrum Of Histo-Morphological Changes In Liver At Autopsy In A Tertiary Health Care Hospital. International Journal. 2022 Sep;5(5):71.
17. Singh D, Tiwari RC, Kumar A, Bhute AR, Meshram RP, Mittal B, Tiwari R, Mittal B. The Role of Pathological Examination of the Liver in Medicolegal Autopsy: A Tertiary Care Center Study From North India. Cureus. 2023 Nov 1;15(11).