



RESEARCH ARTICLE

REVISED Comparison of accidental pediatric scald burns in a tertiary care center: hot cauldron burns versus accidental spill burns [version 2; peer review: 2 approved]Kiran Kishor Nakarmi¹, Bishnu Deep Pathak ², Dhan Shrestha ³, Pravash Budhathoki⁴, Shankar Man Rai¹¹Department of Burns, Plastic and Reconstructive Surgery, Kirtipur Hospital, plect-NEPAL, Kathmandu, Bagmati Province, 44600, Nepal²Department of Internal Medicine, Nepalese Army Institute of Health Sciences, College of Medicine, Kathmandu, Bagmati Province, 44600, Nepal³Department of Internal Medicine, Mount Sinai Hospital, Chicago, Illinois, USA⁴Department of Internal Medicine, Bronx-Lebanon Hospital, Bronxville, New York, USA**V2** First published: 26 Oct 2021, 10:1086
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<https://doi.org/10.12688/f1000research.73840.2>**Abstract****Background:** Scald burns result from exposure to high-temperature fluids and are more common in the pediatric age group. They occur mainly by two mechanisms: (i) spill and (ii) immersion (hot cauldron) burns. These two patterns differ in clinical characteristics and outcomes. Scalds cause significant morbidity and mortality in children. The objective of this study was to compare accidental spill burns and hot cauldron burns in a hospital setting.**Methods:** An analytical cross-sectional study was conducted by reviewing the secondary data of scald cases admitted during the years 2019 and 2020 in a burn-dedicated tertiary care center. Total population sampling was adopted. Data analysis was done partly using SPSS, version-23, and Stata-15. Mann Whitney U-test and Chi-square/Fisher's exact test were done appropriately to find associations between different variables. Binary regression analysis was performed taking mortality events as the outcome of interest.**Results:** Out of 108 scald cases, 43 (39.8%) had hot cauldron burns and 65 (60.2%) had accidental spill burns. Overall mortality was 16 (14.8%), out of which hot cauldron burns and accidental spill burns comprised 12 (75.0%) and 4 (25.0%), respectively. Binary logistic regression analysis showed the type of scald, age, and Baux score found to be associated with mortality. Every one-year increment in age had a 29% lower odds of occurrence of mortality event (adjusted odds ratio [OR], 0.71; 95% confidence interval [CI], 0.50-0.99, p=0.042). Likewise, every one-point increment in Baux score was associated with 19% higher odds of mortality (adjusted OR, 1.190; 95% CI, 1.08-1.32; p<0.001).**Open Peer Review****Reviewer Status**

Invited Reviewers

1

2

version 2

(revision)

10 Jan 2022



report

**version 1**

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report



report

1. **Saidur Rahman Mashreky** , Centre for Injury Prevention and Research Bangladesh, Dhaka, Bangladesh
2. **Roshan Acharya** , Cape Fear Valley Medical Center, Fayetteville, USA

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Conclusions: Accidental spill burn was more common but mortality was significantly higher for hot cauldron burns. The risk of mortality was significantly higher in burn events occurring outside the house, and burns involving back, buttocks, perineum, and lower extremities.

Keywords

accidental, pediatric, burns, immersion

Corresponding author: Bishnu Deep Pathak (bishnupathak433@gmail.com)

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REVISED Amendments from Version 1

This is the first revised version of the article after post-publication reviewers' comments. In this version, we have clarified the objectives of the study. The conclusion section has been edited to make it more aligned with the objectives. Minor grammatical errors have been corrected. Previously, we had used the term "multinomial logistic regression" which was a blunder. We have replaced it with binomial logistic regression because our dependent variables at two different levels of comparison (i.e. types of burns and mortality-yes/no) were dichotomous. Likewise, there were some errors related to using of abbreviations. These have been corrected accordingly.

Any further responses from the reviewers can be found at the end of the article

Introduction

Scald burns are the most common types of burn injuries in children throughout the world.^{1,2} These injuries are the leading causes of morbidity and mortality in the pediatric population.^{3,4} They have long-term physical, psychological and economic impacts on the patients and their families. The majority of scald injuries occur at home and most of them are accidental and preventable.⁵⁻⁷

Scalds result from exposure to hot liquids or steam. They occur mainly by two mechanisms: (i) spill and (ii) immersion burns.⁸⁻¹⁰ Accidental spill burns are due to spillage of hot liquid such as boiling water, tea, milk, oil, soup, etc. These burns usually happen if a child gets in the way of an adult carrying hot fluids or accidentally play with the utensils filled with hot liquid and spill over their body. Immersion burns take place when children fall or put their hands/feet into a vessel containing hot liquid such as bathtub, tea/coffee pots, hot cauldrons, etc.^{3,6,11-14} Past studies have shown that the patterns of these two scalds differ widely for different age groups, gender, and body parts involved, with differences in hospital stay and outcomes secondary to extent of burns.^{6,15-17}

The study of different types of scalds can help to control or reduce the predisposing factors and ultimately help in formulating plans and strategies for prevention. This study aimed to compare accidental spill and immersion (hot cauldron) scald burns in different aspects in a tertiary care center. Moreover, the factors affecting mortality were also studied.

Methods**Study setting**

The study was conducted in the tertiary care center Kirtipur Hospital, Kathmandu, Nepal. It is a national referral center for the management of burn injuries. This hospital has 100 beds in total. Out of these, 32 beds are allocated for burn cases only; of which eight are in Burn Intensive Care Unit (BICU). It takes care of the whole spectrum of burn cases from acute care to the full range of reconstructive services and rehabilitation.

Study description and variables

This was a single-center, analytical, cross-sectional study carried out by reviewing the secondary data of scald burn cases admitted during two years (2019 and 2020). In this study, comparison was done at two different levels. Firstly, the types of burns, namely hot cauldron burns (HCB) and accidental spill burns (ASB) were analyzed in terms of socio-demographic factors, clinical features at presentation, in-hospital treatment measures and associated outcome (i.e. mortality). Next, comparison was done between survivors and non-survivors in terms of socio-demographic factors, presenting features and treatment measures. Out of all scalds, only pediatric cases (age < 18 years) were included in our study. Secondary data was collected from hospital records maintained in electronic form which included all of the acute scald cases admitted to the Plastic Surgery Ward and BICU. Scald cases managed on an outpatient basis were excluded from the study. Total population sampling was used. Those cases with incomplete records were excluded.

The data extracted from the patients' electronic records and stored in our database included demographic information like age, gender, and address of residence. All the immersion injury cases presented to our center had occurred due to falling into cauldrons filled with boiling water containing shredded straw and husk to feed cattle, which is commonly used in Nepal. Spill burns occurred due to spillage of hot liquids (boiling water, tea, coffee, milk, and oil). The mechanism of scalds was categorized into two broad groups: hot cauldron burns (HCB) and accidental spill burns (ASB). Data related to burn injury included type (mechanisms) of scalds, place of burn, pre-hospital intravenous fluid use, presence of infection at presentation, total body surface area, and body parts involved. Likewise, data of in-hospital interventions such as blood transfusion, escharotomy, necrosectomy, tangential excision, second excision, use of graft and/or flap, amputation were also taken. Outcome variables like duration of hospital stay and mortality were also noted.

Since we were collecting data from patients' electronic records, there was possibility that the hospital staffs might have made errors during data entry in the records. This could give rise to information bias in our study. To reduce it to minimum, we cross-checked every information with patients' admission files stored in hospital administratin section itself. Next, all the eligible cases were included in the study. So, there was minimal chance of selection bias as well.

Ethical considerations

Ethical approval was taken from the Institutional Review Committee (IRC no. 006-2021), pfect-NEPAL. Before conducting the study, permission was taken from the Department of Burns, Plastic and Reconstructive Surgery. The anonymity of patient information was well-maintained and thus patient consent was waived by the ethical review board.

Statistics

Shapiro-Wilk W test showed that our continuous variables were distributed non-normally, so median and inter-quartile range (IQR) were calculated. Among categorical variables, Chi-square/Fisher's exact test was applied to check the association between independent and dependent variables. Frequency and percentages were presented appropriately in tables. The level of significance was taken as $p < 0.05$, with a 95% confidence interval (CI) considering a 5% standard error. The analysis was run partly using IBM SPSS version 23, and Stata version 15.

Logistic regression

The dependent variable was mortality outcome, while the rest of the other variables affecting mortality were independent variables. For regression analysis, the outcome of interest as mortality event was taken and those who died in course of treatment were labeled as 1, and those who survived were labeled as 0. Initially binary logistic regression was run to see the effect of individual variables in mortality outcome. Only those variables which were found to be associated in Chi-square/Fisher's exact test and significant continuous variables (age, length of hospital stay, and Baux score) were taken for logistic regression analysis. Later, binary logistic regression analysis was performed to check the exact effect of independent variables adjusting to the rest of the variables to check and nullify the confounding effect of different variables evaluated. Unadjusted odds ratio (OR) for binary logistic regression and adjusted OR were presented with 95% CIs. The pseudo R^2 value for binary logistic regression analysis was 0.5367, indicating that our model predicts a similar outcome in about 54% of observations. Multicollinearity across the studied variables was automatically tested by Stata software and no observed variables were omitted across selected variables for binary logistic regression analysis.

Results

A total of 120 pediatric patients with scald burns were admitted during the two-year period. Out of them, 12 were excluded from our study due to their incomplete records. Finally, 108 cases were analyzed.²³ Demographic and clinical characteristics of the patients are shown in [Table 1](#). The median age of the patients was 2.8 (IQR = 1.6-4.0) years. In total, 61 (56.5%) of them were male and 47 (43.5%) were female. The majority of the burn injuries occurred in the kitchen (57.4%) and most of the patients were from the Low mountain region (60.2%) of Nepal.

Overall, 43 (39.8%) had HCB and 65 (60.2%) had ASB. There was no significant difference in age, gender, place of burns, and pre-hospital intravenous fluid use in the two groups of scald patients. Baux score was higher in HCB (17.5, IQR = 14.0-27.0) but the median body surface area of burns was equal (15%) in both the groups. In total, 13 cases (12.0%) had an infection at presentation, which was higher in HCB (53.8%) than in ASB (46.2%). Neither of them were statistically significant.

The most commonly involved body parts were lower extremities (55.6%) followed by upper extremities (49.1%) and hands (40.7%). Of all the lower extremities burns, 36 (60.0%) were from ASB, and 24 (40.0%) were from HCB. None of these were statistically significant.

Tangential excision was performed in 52 (48.1%) patients, of which 34 (65.4%) and 18 (34.6%) belonged to ASB and HCB groups, respectively. Cases requiring the second excision (7.4%) were equally distributed in both groups (50.0%). Only two patients required flap and amputation and they were from the HCB group.

Overall mortality was 16 (14.8%). Out of total deaths, 12 (75%) were from HCB and four (25%) from the ASB group. This was statistically significant ($p = 0.002$). Requirement of in-hospital blood transfusion was significantly higher ($p = 0.030$) in HCB (57.1%) than ASB cases (42.9%). The median duration of hospital stay in both groups was nine days (IQR in HCB: 5.0-13.0, ASB: 3.0-14.0).

Table 1. Cross-tabulation of different variables with the type of scalds.

SN	Characteristics	Total n(%)	HCB n(%)	ASB n(%)	p-value
1.	N	108(100.0)	43(39.8)	65(60.2)	
2.	Age (in years)	2.8(1.6-4.0)	3(2.0-4.0)	2.5(1.3-4.0)	0.362
3.	Sex (males)	61(100.0)	25(41.0)	36(59.0)	0.777
4.	Place of Burns:				0.152
	Kitchen	62(100.0)	21(33.9)	41(66.1)	
	Inside house	41(100.0)	21(51.2)	20(48.8)	
	Outside	5(100.0)	1(20.0)	4(80.0)	
5.	Baux Score	17.0(11.6-25.8)	17.5(14.0-27.0)	16.0(10.5-23.5)	0.307
6.	Total Body Surface Area (TBSA)	15.0(8.0-20.0)	15.0(8.0-22.0)	15.0(8.0-19.0)	0.463
7.	Body parts involved:				
	Head and Neck	22(100.0)	6 (27.3)	16 (72.7)	0.178
	Face	38(100.0)	11(28.9)	27(71.1)	0.089
	Chest	40(100.0)	15(37.5)	25(62.5)	0.706
	Abdomen	36(100.0)	15(41.7)	21(58.3)	0.781
	Back	31(100.0)	14(45.2)	17(54.8)	0.471
	Buttock	29 (100.0)	15(51.7)	14(48.3)	0.126
	Perineum	9(100.0)	5(55.6)	4(44.4)	0.479
	Upper Extremities	53(100.0)	20(37.7)	33(62.3)	0.665
	Hands	44(100.0)	16(36.4)	28(63.6)	0.544
	Lower Extremities	60(100.0)	24(40.0)	36(60.0)	0.965
8.	Pre-hospital Intravenous Fluid Use	22(100.0)	12(54.5)	10(45.5)	0.114
9.	In-hospital Blood Transfusion	28(100.0)	16(57.1)	12(42.9)	0.030
10.	Duration of hospital stay (days)	9.0(5.0-14.0)	9.0(5.0-13.0)	9.0(3.0-14.0)	0.237
11.	Infection at admission	13(100.0)	7(53.8)	6(46.2)	0.270
12.	Escharotomy	6(100.0)	3(50.0)	3(50.0)	0.681
13.	Necrosectomy	2(100.0)	1(50.0)	1(50.0)	1.000
14.	Tangential Excision	52(100.0)	18(34.6)	34(65.4)	0.287
15.	Second Excision	8(100.0)	4(50.0)	4(50.0)	0.710
16.	Graft use	50(100.0)	16(32.0)	34(68.0)	0.123
17.	Graft type				0.109
	Autograft	48(100.0)	15(31.3)	33(68.8)	
	Allograft	1(100.0)	0	1(100.0)	
	Both auto- and allografts	1(100.0)	1(100.0)	0	
17.	Amputation	2(100.0)	2(100.0)	0	0.156
18.	Use of flap	2(100.0)	2(100.0)	0	0.156
19.	In-hospital mortality	16(100.0)	12(75.0)	4(25.0)	0.002

Note: Continuous variables are expressed as median (IQR) and categorical variables as number (percentage). The p-value is derived from Mann Whitney U test for continuous variables and Chi-square/Fisher's exact test for categorical variables. SN, Serial Number; HCB, Hot Cauldron Burns; ASB, Accidental Spill Burns; TBSA, Total Body Surface Area.

A significant association was seen between the dependent variable mortality and type of scalds ($p = 0.002$), place where burn injury took place ($p = 0.010$), and involvement of body parts like back ($p = 0.015$), buttock (0.001), perineum ($p = 0.026$) and lower extremities (0.005) (Table 2).

Table 2. Cross-tabulation of different variables with mortality outcome using Chi-square/Fisher's exact test.

Variables		Total	Mortality n(%)		p-value
			No	Yes	
Gender	Male	61(100.0)	51(83.6)	10(16.4)	0.599
	Female	47(100.0)	41(87.2)	6(12.8)	
Type of Scalds	HCB	43(100.0)	31(72.1)	12(27.9)	0.002
	ASB	65(100.0)	61(93.8)	4(6.2)	
Place of burn injury	Outside	5(100.0)	3(60.0)	2(40.0)	0.010
	Home	41(100.0)	31(75.6)	10(24.4)	
	Kitchen	62(100.0)	58(93.5)	4(6.5)	
Head and Neck	Yes	22(100.0)	18(81.8)	4(18.2)	0.737
	No	86(100.0)	74(86.0)	12(14.0)	
Face	Yes	38(100.0)	33(86.8)	5(13.2)	0.721
	No	70(100.0)	59(84.3)	11(15.7)	
Chest	Yes	40(100.0)	34(85.0)	6(15.0)	0.967
	No	68(100.0)	58(85.3)	10(14.7)	
Back	Yes	31(100.0)	22(71.0)	9(29.0)	0.015
	No	77(100.0)	70(90.9)	7(9.1)	
Abdomen	Yes	36(100.0)	28(77.8)	8(22.2)	0.125
	No	72(100.0)	64(88.9)	8(11.1)	
Buttock	Yes	29(100.0)	19(65.5)	10(34.5)	0.001
	No	79(100.0)	73(92.4)	6(7.6)	
Perineum	Yes	9(100.0)	5(55.6)	4(44.4)	0.026
	No	99(100.0)	87(87.9)	12(12.1)	
Upper Extremities	Yes	53(100.0)	46(86.8)	7(13.2)	0.644
	No	55(100.0)	46(83.6)	9(16.4)	
Hands	Yes	44(100.0)	38(86.4)	6(13.6)	0.775
	No	64(100.0)	54(84.4)	10(15.6)	
Lower Extremities	Yes	60(100.0)	46(76.7)	14(23.3)	0.005
	No	48(100.0)	46(95.8)	2(4.2)	
Pre-hospital intravenous fluid	Yes	22(100.0)	19(86.4)	3(13.6)	1
	No	86(100.0)	73(84.9)	13(15.1)	
In-hospital Blood transfusion	Yes	28(100.0)	23(82.1)	5(17.9)	0.555
	No	80(100.0)	69(86.3)	11(13.8)	
Infection at admission	Yes	13(100.0)	11(84.6)	2(15.4)	1
	No	95(100.0)	81(85.3)	14(14.7)	
Tangential Excision	Yes	52(100.0)	46(88.5)	6(11.5)	0.356
	No	56(100.0)	46(82.1)	10(17.9)	
Escharotomy	Yes	6(100.0)	5(83.3)	1(16.7)	1
	No	102(100.0)	87(85.3)	15(14.7)	
Graft (yes or no)	Yes	50(100.0)	44(88.0)	6(12.0)	0.445
	No	58(100.0)	48(82.8)	10(17.2)	
Graft Type	Autograft	48(100.0)	43(89.6)	5(10.4)	0.145
	Allograft	1(100.0)	1(100.0)	0(0.0)	
	Auto and Allo	1(100.0)	0(0.0)	1(100.0)	

Table 2. Continued

Variables		Total	Mortality n(%)		p-value
			No	Yes	
Flap	Yes	2(100.0)	2(100.0)	0(0.0)	1
	No	106(100.0)	90(84.9)	16(15.1)	
Second excision	Yes	8(100.0)	7(87.5)	1(12.5)	1
	No	100(100.0)	85(85.0)	15(15.0)	
Amputation	Yes	2(100.0)	2(100.0)	0(0.0)	1
	No	106(100.0)	90(84.9)	16(15.1)	
Necrosectomy	Yes	2(100.0)	1(50.0)	1(50.0)	0.276
	No	106(100.0)	91(85.8)	15(14.2)	

Note: All these categorical variables are expressed as number (percentage). The p-value is derived from Chi-square/Fisher's exact test. HCB, Hot Cauldron Burns; ASB, Accidental Spill Burns.

Logistic regression

Binary logistic regression analysis was run to check association across variables showing significant association by Chi-square/Fisher's exact test and continuous variables namely, patient's age, length of hospital stay, and Baux score (Table 3). Binary logistic regression showed higher mortality in HCB in comparison to ASB type of scald. Similarly, burns occurring outside the house had a higher association with mortality. Involvement of the back, buttock, perineum, and lower extremities was found to be associated with higher odds of mortality. However, adjusting independent variables and continuous variables (age, Baux score, length of stay) showed the only type of scald, age, and Baux score found to be associated with mortality. Every one-year increment in age has a 29.0% lower odds of occurrence of mortality event (adjusted OR, 0.71; 95% CI, 0.50-0.99, $p = 0.042$). Likewise, every one-point increment in Baux score was associated with 19% higher odds of mortality (adjusted OR, 1.19; 95% CI, 1.08-1.32; $p < 0.001$).

Discussion

In our study, HCB and ASB accounted for 39.8% and 60.2% of total cases respectively. Although there are numeric differences across the two groups in terms of demographic and clinical profile, statistical significance exists in mortality and in-hospital blood transfusion only. Overall mortality was 16 (14.8%), out of which 12 (75%) were from HCB and 4 (25%) from the ASB group. Blood transfusion was required more in HCB cases (57.1%) than in ASB cases (42.9%). Mortality was higher in male gender (16.4%), burns outside the house (40.0%), body parts involving head and neck (18.2%), chest (15.0%), back (29.0%), abdomen (22.2%), buttocks (34.5%), perineum (44.4%), lower extremities (23.3%) and those who underwent escharotomy (16.7%) and necrosectomy (50.0%). Out of these, burns outside house ($p = 0.010$), involvement of buttocks ($p = 0.001$), back ($p = 0.015$), perineum ($p = 0.026$) and lower extremities ($p = 0.005$) were statistically significant.

A study in India¹⁸ reported the mortality in pediatric scald burns to be 3.1% which is lower compared to our number (14.8%). The plausible explanation for these differences is the difference in the site of study, sample size, and duration of the study. Another reason could be because our center is a national referral center for burns, so it is likely that more complicated and extensive cases are being referred here. Another study in Kashmir, India¹⁹ showed mortality from scalds to be 10.7% which is comparable to our findings. The most common place of burn event in our study was a kitchen (57.4%) which is comparable to a study (64.7%) done by Riedlinger DI *et al.* Similarly, grafting was done in 41.2% of patients which also corresponds to our study (46.3%).⁵ Another study⁶ depicted the incidence of accidental immersion and spill burns as 5.4% and 81.4%, respectively, which differs from our findings where immersion (hot cauldron) and spill burns comprise 39.8% and 60.2%, respectively. Similarly, a Turkish study³ showed that the most frequent cause of burn was scalding from spillage of hot water (59.7%) followed by bath scalding (i.e. immersion injury) accounting for 26% of cases. This is in line with the percentage of spill burns in our case. Likewise, in Japan, immersion burn (59.3%) was reported to be higher than spill burns (40.7%).¹⁶ This could be due to the provision of the bathtub in developed countries like Japan where there is a high chance of children climbing up and falling into bathtubs.

The most commonly involved body parts were lower limbs (55.6%) and upper limbs (49.1%) in our study. This finding contradicts a study by Drago DA *et al.*,⁶ where the upper torso (25.3%) and upper limbs (24.1%) were maximally involved. A Japanese study¹⁶ revealed that the most common sites of immersion injury were trunk and legs (80%) followed by arms, and those of spill burns were trunk (91.7%) followed by head/neck and arms. In our case, the most common body parts involved were lower followed by upper extremities. The same study showed the average body

Table 3. Cross-tabulation of different variables with mortality outcome using multinomial logistic regression.

Mortality	uOR	[95% Conf. Interval]	z	P> z	aOR	[95% Conf. Interval]	z	P> z		
Type (ASB®)										
HCB	5.903226	1.757944	19.8232	2.87	0.004*	40.93118	3.598128	465.6204	2.99	0.003*
Place of burn (Kitchen®)										
Outside	9.666666	1.23679	75.55403	2.16	0.031*	17.62378	.2270896	1367.732	1.29	0.196
Home	4.677419	1.355177	16.1442	2.44	0.015*	1.985822	.2886093	13.66376	0.70	0.486
Back (No®)										
Yes	4.090909	1.364786	12.26239	2.52	0.012*	.2862989	.030569	2.681378	-1.10	0.273
Buttock (No®)										
Yes	6.403509	2.066449	19.84318	3.22	0.001*	1.834235	.2428109	13.85612	0.59	0.557
Perineum (No®)										
Yes	5.8	1.365009	24.64453	2.38	0.017*	.4362471	.0299323	6.358065	-0.61	0.544
LE (No®)										
Yes	6.999993	1.505288	32.55184	2.48	0.013*	14.85796	.9267597	238.2052	1.91	0.057
Age	.9742711	.8173489	1.161321	-0.29	0.771	.7059931	.5048816	.9872142	-2.04	0.042*
Length of hospital stay	1.010032	.9505634	1.073222	0.32	0.747	.9490669	.8554489	1.05293	-0.99	0.324
Baux	1.099279	1.048855	1.152127	3.95	0.000*	1.194787	1.081358	1.320114	3.50	0.000*
Constant						.0001546	1.58e-06	.0151046	-3.75	0.000

Note: *, significant; ®, reference; uOR, unadjusted Odds ratio; aOR, adjusted Odds ratio; HCB, Hot Cauldron Burns; ASB, Accidental Spill Burns; LE, Lower Extremities.

surface area of scald as 11.3% which is slightly lower than ours (15.0%). Immersion-related burns were more likely to be located on the lower half of the body involving buttocks, thighs, legs, and feet in a French study.¹⁷ Another also found out that most scalds occurred on the upper limbs.²⁰ These discrepancies could be due to different sample sizes and sites of study. The mean total body surface area reported in a study from Arizona²¹ was 8.0% which is much lower than ours (15.0%). The difference could be due to our center being a referral center where complicated burn cases are being referred from all over the country. However, the mean length of hospital stay in this study²¹ (8 days) is similar to our study (9 days).

In a study from Ontario,¹⁵ Children with spill burns had a shorter average length of hospital stay (10.8 days) compared to those involved in bathtub immersion burns (18.3 days). In our study, the median duration of hospital stay was equal in both the groups of scalds (nine days) though it was not statistically significant. Likewise, in the same study, the mean age in both scald groups was 1.8 years whereas, in our setting, the median age in HCB and ASB were 3.0 and 2.5 years, respectively. A study from Beijing²² showed that the scald burns most commonly occurred in the kitchen which supports our result.

There are some limitations of this study that need to be mentioned. The number of cases was lower than expected because of the ongoing coronavirus disease 2019 (COVID-19) pandemic. Lack of complete data also excluded a significant portion of cases from the study. The data also fails to analyze the economic status of children which could make them susceptible not only to a certain type of scald burn but also limits the access to first aid and primary care, hence affecting the outcome. Moreover, this is a single-center study over a short period of time so, the results may not be applicable to the whole country. For that purpose, multi-center studies conducted over a longer duration are recommended.

Conclusions

ASB was more common in our setting. The mortality was higher in HCB group. These were more likely to require an in-hospital blood transfusion compared to patients with ASB. There were no other significant differences between these two groups. The risk of mortality was significantly higher in burn events occurring outside, and those involving the back, buttocks, perineum, and lower extremities. So, special focus should be given to these factors during management.

Data availability

Figshare: Comparison of Accidental Pediatric Scald Burns in a Tertiary Care Center: Hot Cauldron Burns versus Accidental Spill Burns.sav. <http://doi.org/10.6084/m9.figshare.16583501>.²³

Data are available under the terms of the [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/) (CC-BY 4.0).

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Saidur Rahman Mashreky 

Centre for Injury Prevention and Research Bangladesh, Dhaka, Bangladesh

Thank you for addressing the issues.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Injury Prevention including burns, Non Communicable disease including mental health

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 21 December 2021

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Roshan Acharya 

Department of Internal Medicine, Cape Fear Valley Medical Center, Fayetteville, NC, USA

1. The authors have tried to compare the prevalence and outcome of hot cauldron burns versus accidental spill burns in a tertiary care hospital.

2. The authors have also explored various factors that are associated with mortality in burn patients in the hospital.
3. The statistical methods are sound and the results are well presented.
4. The authors have well discussed the existing relevant literature. However, as the authors have rightly pointed out, the number of the patients included in the study seems to be low for the number of cases, but it is understandable being a single center study taking pediatric burn patients. Secondly, the prevalence of different types of burn cases may not be relevant in other settings.
5. Overall, the study has been well conducted and the manuscript has been well written according to the context.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Clinical, Critical Care, Pulmonology

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 03 November 2021

<https://doi.org/10.5256/f1000research.77525.r97945>

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Saidur Rahman Mashreky 

Centre for Injury Prevention and Research Bangladesh, Dhaka, Bangladesh

Thank you for conducting an exciting study in the field of burn prevention.

The study's title is 'Comparison of accidental pediatric scald burns in a tertiary care center: hot cauldron burns versus accidental spill burns'. The study aimed to compare accidental spill and immersion (hot cauldron) scald burns in a tertiary care center and assess morbidity and mortality caused by them.

The objective of the study is less clear. However, in this study, the authors tried to determine the type of scald burn that is more prevalent and attempted to explore the association between the type of scald burn and the severity of morbidity and mortality. However, to answer this kind of research question, authors need to select an analytical study design.

The conclusion section of the article was not much aligned with your study title and objective.

In my understanding, it is better to redesign the study to see the distribution of scald burn and its consequence.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Injury Prevention including burns, Non Communicable disease including mental health

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 25 Dec 2021

Bishnu Pathak, Nepalese Army Institute of Health Sciences, College of Medicine,
Kathmandu, Nepal

Dear Sir,

Thank you very much for reviewing our article and for providing healthy, constructive, and relevant comments. We owe you a great debt of gratitude for the same.

We have tried to make the necessary corrections as suggested by you in the new version. There are a few things that we would like to put forward.

1. You have commented on the design of the study. Our study is an analytical cross-sectional study. We have done comparisons at two different levels. Firstly, between the types of burns (hot cauldron burns and accidental spill burns). Secondly, a comparison is done between survivors and non-survivors, though this is not mentioned in the title of the article. It is because our primary objective was to analyze the types of scald burns in children. But, during analysis, we found many factors interestingly affecting the mortality, due to which we did a second comparison as well. This could be helpful to the scientific literature that is lacking these sorts of findings.

2. We have written the conclusion as suggested by you, such that it sounds being aligned with the title of the study.

3. We have also tried to write objectives more clear than before.

We humbly request you to look upon these changes.

Thank you
Regards
Bishnu Deep Pathak

Competing Interests: No competing interests were disclosed.

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