SAS Journal of Surgery
Abbreviated Key Title: SAS J Surg
ISSN 2454-5104
Journal homepage: https://www.saspublishers.com

OPEN ACCESS

Burn and Plastic Surgery

Outcome Assessment between Burned Pregnant & Non-Pregnant Women- A Comparative Study in a Tertiary Care Hospital

Dr. Sayeqa Nasreen Khondker[1*], Dr. S. M. Mohiuddin[2]

[1]Assistant Professor, Department of Burn and Plastic Surgery, Sir Salimullah Medical College, Dhaka, Bangladesh
[2]Assistant Professor, Endocrinology and Diabetes, Sir Salimullah Medical College, Dhaka, Bangladesh

DOI: 10.36347/sasjs.2022.v08i07.003 | **Received:** 11.06.2022 | **Accepted:** 25.07.2022 | **Published:** 30.07.2022

***Corresponding author:** Dr. Sayeqa Nasreen Khondker
Assistant Professor, Department of Burn and Plastic Surgery, Sir Salimullah Medical College, Dhaka, Bangladesh

Abstract **Original Research Article**

Background: Burn injuries sustained during pregnancy are often connected with a high mortality risk for both the mother and the unborn child. Although they are not very common, they have the potential to alter the course of events for both the mother and the growing fetus. ***Objective:*** To see and compare the outcome between burned pregnant and non-pregnant women. ***Methods:*** This cross sectional comparative study was conducted at the department of Burn and Plastic surgery of Dhaka Medical College Dhaka, from July2016 to December 2017 for the duration of 18(eighteen) months A total no of 90 patients (45 patients in each group) have considered as our sample size. Purposive sampling technique was followed in this study. Pretested data collection sheet was developed to gather data. Face to face interview and review of clinical data was done to collect data. Lund Browder chart was applied to calculate the proportion of burns based on the total body surface area (TBSA). Pregnancy confirmation done by history and ultrasonography. Urine dipstick tests were not done routinely. All patients were managed with a standard protocol for burn care in consultation with an obstetrician in case of pregnancy. The outcome was monitored often and reported. SPSS v25 was used to data analysis. Chi square test used to measure the correlation between independent and dependent variable. P value $\leq$ 0.01 considered as significant value. Statistical analyses were used to assess the relative predictive power of %TBSA, age, trimester of pregnancy, and complications of burn as predictors of maternal and fetal mortality. ***Results:*** The mean age of pregnant women was (25.09±7.04) and non-pregnant women (26.71±8.30). 86.7% pregnant and 82.2% non-pregnant women were burned accidentally while 13.3% pregnant and 17.8% non-pregnant women had suicidal burn. Death occurred in 44.4 % of pregnant and 24.4 % in non- pregnant women. Fetal death along with maternal death was reported 36.8%, abortion 36.8%, IUD 15.9%, still birth was reported 10.5%. Among 13.3% of 1st trimester pregnant woman 5% reported dead and 20.0% reported alive, among 40.0% of 2nd trimester pregnant women 30.0% reported dead and 48.0% reported alive, among 46.7% of 3rd trimester pregnant women 46.7% reported dead and 32.0% reported alive. In this present study a highly significant relationship (p=0.001) found between total body surface area (TBSA) and outcome among both pregnant & non-pregnant women. Among 28.9% pregnant women whose burnt <15% of body 15.0% died and 40.0% alive, among 40.0% pregnant patient with 15-30% burn 25.0% died and 52.0% alive, 17.8% patient with 31-40% burn 30.0% died and 8.0% alive, 13.3% pregnant patient with burn>40% ,30.0% died and no one left alive. Among 33.3% non-pregnant women with burn<15% of body no death report found, 40.0% patient with 15-30% burn 18.2% died and 47.1% alive, 20.0% burnt 31-40% area of body 54.5% died and 8.8% alive, 6.7% burnt >40% area of body 27.3% died and no alive found. Complication related with burn is also higher in pregnant than non-pregnant patients. ***Conclusion:*** Burn outcome in female may be impacted by fetal presence, % of TBSA burnt, presence of inhalation injury and other complications. Fetal outcome is closely related with maternal outcome. Early Hospitalization, aggressive fluid management, proper management of suspected inhalation injury and early identification and management of infection and sepsis by appropriate antibiotic which are safe for fetus can reduce both maternal and fetal death. Multidisciplinary team approach including plastic surgeon, obstetrician, anaesthesiologist, nutritionist, physiotherapist as well as psychiatrist is required for improving outcome.

Keywords: Burns in pregnancy, Non-pregnant women, fetal outcomes, Gestational age (trimester), maternal outcomes, and Total body surface area (TBSA).

INTRODUCTION

Since the majority of the case reports have originated from low-income nations, burn injuries sustained by pregnant women are more prevalent in developing countries [1–4]. Burns are the most prevalent form of injury, and the most common cause of burns is the unintentional igniting of kerosene. A total of around 295,000 women lost their lives in 2017 as a result of complications related to pregnancy, delivery,

or both [5]. The great majority of these fatalities (about 94 percent) took place in environments with limited resources, and the vast majority of them could have been avoided [6]. There are a number of factors that can affect the rate of mortality and morbidity in burned patients during pregnancy. Some of these factors include the size and depth of the burn injury, the patient's age when they become pregnant, the state of the mother's health, and the presence of inhalation injury [7]. During pregnancy, human physiology goes through a number of changes that add additional stress to already heavily changed systems. Close interactions between the surgical and obstetric teams as well as individualization of care are constantly required [8]. An rise in body temperature brings about an increase in the likelihood of a spontaneous abortion as well as an early labor. Prostaglandins are caused to be released into the blood of the mother as a result of the thermal shock to the tissues. This causes the myometrium to be stimulated, which might result in potentially deadly obstetric problems. The likelihood of a fetus surviving to term is directly proportional to its level of development, and fluid volume and electrolyte shifts have the most dramatic impact. The most serious and sometimes fatal consequence that may result from burn injuries is infection. It is possible that the occurrence might be reduced by educating pregnant women about appropriate clothes and also by taking secondary preventative actions such as providing timely first-aid procedures. Women in less-developed nations have, on average, many more pregnancies than women in industrialized countries, and their lifetime risk of mortality due to pregnancy is greater. This is because less-developed countries have lower life expectancy overall [9]. Every woman needs to be able to have access to high-quality care before, during, and after the labor and delivery of her child. There is a strong connection between a mother's health and the wellbeing of her unborn child. There are just a few of publications that have investigated various facts of this issue, and they all have quite different findings. The purpose of this research is to compare the outcomes of female burn victims who were pregnant and those who were not pregnant.

OBJECTIVES

To see and compare the outcome assessment between burned pregnant and non-pregnant women.

METHODOLOGY

This cross sectional comparative study was conducted at the department of Burn and Plastic surgery of Dhaka Medical College Dhaka, from July2016 to December 2017 for the duration of 18(eighteen) months A total no of 90 patients (45 patients in each group) have considered as our sample size. Purposive sampling technique was followed in this study. Pretested data collection sheet was developed to gather data. Face to face interview and review of clinical data was done to collect data. Lund Browder chart was applied to calculate the proportion of burns based on the total body surface area (TBSA). Pregnancy confirmation done by history and ultrasonography. Urine dipstick tests were not done routinely. All patients were managed with a standard protocol for burn care in consultation with an obstetrician in case of pregnancy. The outcome was monitored often and reported. SPSS v25 was used to data analysis. Chi square test used to measure the correlation between independent and dependent variable. P value < 0.01 considered as significant value. Statistical analyses were used to assess the relative predictive power of %TBSA, age, trimester of pregnancy, and duration of hospital stay complications of burn as predictors of maternal and fetal mortality.

RESULTS

Table 1 reveals that according to the age group of 16 to 20 years (min 16 years, max 45 years), 33.3% of the participants were pregnant women while 28.9% were non-pregnant, between 21 and 25 years 31.1 % were pregnant women while 24.4% were non-pregnant, between 26 and 30 years, 22.3% were pregnant women while 17.8% were non- pregnant, between 31 and 35 years 6.7% were pregnant women and 11.1%were non-pregnant women, between 36 and 40 years, 2.2% were pregnant women while 8.9% were non-pregnant, between 41 and 45 years, 4.4% were pregnant while 8.9% were non-pregnant women. The mean and standard deviation of the age of the participants were reported for pregnant women (25.09±7.04), non-pregnant women (26.71±8.30).

Table 1: Distribution of participants according to age (N=90)

Age (years)	Pregnant Women (n=45)	Non-Pregnant Women(n=45)
16 -20 yrs.	15(33.3)	13(28.9)
21 -25 yrs.	14(31.1)	11(24.4)
26 -30 yrs.	10(22.3)	8(17.8)
31 – 35 yrs.	3(6.7)	5(11.1)
36 - 40 yrs.	1(2.2)	4(8.9)
41 - 45 yrs.	2(4.4)	4(8.9)
Mean ± SD	25.09±7.04	26.71±8.30
Range (min-max)	16 - 45	16 - 45

Table 2 shows that 82.2% pregnant woman and 60.0% non-pregnant women had flame burn, 11.2% pregnant women and 31.2% non-pregnant women had scald burn, 2.2% pregnant women and 4.4% had chemical burn, while 4.4% for both pregnant and non-pregnant women had electric burned.

Table 2: Distribution of patients according to an etiology of burn (N=90)

Burn type	Pregnant Women (n=45)	Non- Pregnant Women (n=45)
Flame	37(82.2)	27 (60.0)
Scald	5 (11.2)	14 (31.2)
Chemical	1 (2.2)	2 (4.4)
Electric	2 (4.4)	2 (4.4)

Table 3 explores according to mode of burn 86.7% pregnant and 82.2% non-pregnant women were had accidental burn, while 13.3% pregnant and 17.8% non-pregnant women had suicidal burn.

Table 3: Distribution of patients according to mode of burn (N=90)

Cause of burn	Pregnant Women(n=45)	Non-Pregnant Women(n=45)
Accidental	39 (86.7)	37 (82.2)
Suicidal	6 (13.3)	8 (17.8)

According to gestational age of pregnant women, 13.3% were in first trimester, 40.0% in second trimester and 46.7% were in third trimester.

Table 4: Distribution of patients according to gestational age (n=45)

Gestational age	Pregnant Women (n=45)
First trimester	6 (13.3)
Second trimester	18 (40.0)
Third trimester	21(46.7)

According to final outcome of the study 55.6% pregnant women found alive and 44.4% reported dead, 75.6% non-pregnant women found alive while 24.4% were reported dead.

Table 5: Outcome among pregnant and non-pregnant woman (N=90)

Maternal outcome	Pregnant Women(n=45)	Non- Pregnant Women(n=45)
Alive	25 (55.6)	34 (75.6)
Dead	20 (44.4)	11 (24.4)

According to fetal outcome of pregnant women, 57.8% fetus was alive while 42.2% fetus died. Among alive fetus 46.2% pregnancy continued, 42.3% underwent normal vaginal delivery (NVD), LUCS was reported 11.5%. 36.8% fetus died with maternal death, abortion was reported 36.8%, IUD was reported 15.9%, and still birth was reported 10.5%.

Table 6: Fetal outcome of pregnant women (n=45)

Fetal outcome	n=45(%)
Alive fetus	**26(57.8)**
Continue with pregnancy	12(46.2)
NVD	11(42.3)
LUCS	3(11.5)
Dead fetus	**19(42.2)**
Maternal death	7 (36.8)
Abortion	7 (36.8)
IUD	3 (15.9)
Still birth	2 (10.5)

A significant relationship found between gestational age and maternal outcome among pregnant women ($p<0.05$). Among 13.3% of 1st trimester pregnant woman 5% reported dead and 20.0% reported alive, among 40.0% of 2nd trimester pregnant women 30.0% reported dead and 48.0% reported alive, among 46.7% of 3rd trimester pregnant women 65.0% reported dead and 32.0% reported alive.

Table 7: Distribution of gestational age of pregnant women (n=45)

Gestational age	Maternal outcome			p-value (<0.01)
	Pregnant Women (n=45)			
	Total (n=45)	Dead (n=20)	Alive (n=25)	
1st trimester	6(13.3)	1(5.0)	5(20.0)	0.032
2nd trimester	18(40.0)	6(30.0)	12(48.0)	
3rd trimester	21(46.7)	13(65.0)	8(32.0)	

A highly significant relationship (p=0.001) found between total body surface area (TBSA) and Maternal outcome among both pregnant & non-pregnant woman. Among 28.9% pregnant women whose burn were <15% of body ,15.0% died and 40.0% alive, 40.0% burnt 15-30% area of body 25.0% died and 52.0% alive, 17.8% burnt 31-40% area of body 30.0% died and 8.0% alive, 13.3% burnt >40% area of body 30.0% died and no alive found.

Among 33.3% non-pregnant women whose burnt <15% of body no death report found and 44.1% alive, 40.0% burnt 15-30% area of body 18.2% died and 47.1% alive, 20.0% burnt 31-40% area of body 54.5% died and 8.8% alive, 6.7% burnt >40% area of body 27.3% died and no alive found.

Table 8: TBSA distribution among pregnant and non-pregnant women (N=90)

TBSA (%)	Maternal outcome						
	Pregnant Women (n=45)			Non- Pregnant Women (n=45)			p-value (<0.01)
	Total (n=45)	Dead (n=20)	Alive (n=25)	Total (n=45)	Dead (n=11)	Alive (n=34)	
<15	13 (28.9)	3 (15.0)	10 (40.0)	15 (33.3)	0 (0.0)	15 (44.1)	0.001
15 - 30	18 (40.0)	5 (25.0)	13 (52.0)	18 (40.0)	2 (18.2)	16 (47.1)	
31 - 40	8 (17.8)	6 (30.0)	2 (8.0)	9 (20.0)	6 (54.5)	3 (8.8)	
>40	6 (13.3)	6 (30.0)	0 (0.0)	3 (6.7)	3 (27.3)	0 (0.0)	
Mean ± SD	2.16±.1.00	2.75±1.07	1.68±0.63	2.00±0.90	3.09±0.70	1.65±0.65	

There is a significant relationship between % of TBSA and fetal mortality in pregnant patient.

Table 9: Distribution of patients according to TBSA% and fetal outcome (n=45)

TBSA (%)	Fetal outcome			*p*-value (<0.01)
	Pregnant Female (n=45)			
	Total (n=45)	Dead (n=19)	Alive (n=26)	
<15	12 (26.7)	5 (26.2)	7(26.9)	0.028
15 - 30	18 (40.0)	6(31.6)	12(46.2)	
31 - 40	8 (17.8)	4(21.1)	4(15.4)	
>40	7 (15.5)	4(21.1)	3(11.5)	

A highly significant relationship (p=0.001) found between Inhalation injury and fatality among both pregnant & non-pregnant women. Among 22.2% pregnant women with presence of inhalation injury 40.0% died and 8.0% alive, in absence of inhalation among 77.8% pregnant women 60.0% died and 92.0% alive, among 26.7% non-pregnant women with presence of inhalation injury 63.6% died and 14.7% alive, in absence of inhalation injury among 73.3% non-pregnant women 36.4% died and 85.3% alive.

Table 10: Distribution of inhalation injury among pregnant and non-pregnant women (N=90)

Inhalation injury	Outcome						p-value (<0.01)
	Pregnant Women (n=45)			Non- Pregnant Women (n=45)			
	Total (n=45)	Dead (n=20)	Alive (n=25)	Total (n=45)	Dead (n=11)	Alive (n=34)	
Present	10 (22.2)	8 (40.0)	2 (8.0)	12 (26.7)	7 (63.6)	5 (14.7)	0.001
Absent	35 (77.8)	12 (60.0)	23 (92.0)	33 (73.3)	4 (36.4)	29 (85.3)	

According to burn complications among pregnant and non-pregnant women, shock was noted in 20.0% among pregnant women and 11.11% among non-pregnant women. Wound infection occurred in 55.6% pregnant and 44.4% in non-pregnant patients. Septicaemia noted in 33.3% pregnant and 17.8% non – pregnant patients, 17.8% pregnant patient suffered from ARDS in compare to 6.7% in non-pregnants, 15.55% pregnant and 8.88% non-pregnant patients had multiorgan dysfunction syndrome(MODS), 55.6%pregnant and 24.4%non-pregnant patients died. The difference is statistically significant

Table 11: Distribution of burn complications among pregnant and non-pregnant women (N=90)

Burn complications	Pregnant Women (n=45)	Non-Pregnant Women (n=45)
Shock	9 (20.0)	5(11.11)
Wound infection	25(55.6)	20 (44.4)
Septicaemia	15(33.3)	8(17.8)
ARDS	8(17.8)	3(6.7)
MODS	7(15.55)	4(8.88)
Death	25(55.6)	11(24.4)

According to causes of death in pregnant women 15.0% reported irreversible burn shocked, 45.0% found septicemia, 25.0% reported MODS, 10.0% reported ARDS and 5.0% reported DCM, in non-pregnant women 18.8% reported irreversible burn shocked, 36.4% found septicemia, 27.27% found MODS, 18.2% reported ARDS and no DCM found.

Table 12: Cause of death of pregnant and in non-pregnant woman (n=31)

Cause of death	Pregnant Women (n=20)	Non- Pregnant Women (n=11)
Irreversible burn shock	3(15.0)	2(18.18)
Septicemia	9(45.0)	4(36.4)
MODS	5(25.0)	3(27.27)
ARDS	2(10.0)	2(18.2)
DCM	1(5.0)	0(0.0)

A significant relationship (p=0.026) found between burn complication and outcome among pregnant & non- pregnant woman. Among 45 pregnant women the frequency rate of death for burn complication like Burn shock, infection, septicemia, ARDS, MODS and DCM reported 15.0%, 5.0%, 45.0%, 4.44%, 35.0% and 2.2% respectively. Among 45 non-pregnant woman the frequency rate of death for burn complication like Burn shock, infection, septicemia, ARDS, MODS and DCM reported 18.18%, 0.0%, 36.36%, 4.44%, 27.27% and 0.00% respectively.

Table: 13 Relationship of complications with death among pregnant and non-pregnant women (N=90)

Burn complications	Maternal Outcome						p-value (<0.01)
	Pregnant Women (n=45)			Non- Pregnant Women (n=45)			
	Total (n=45)	Dead (n=20)	Alive (n=25)	Total (n-45)	Dead (n=11)	Alive (n=34)	
Burn shock	3(6.66)	3(15.0)	0(0.0)	5(11.11)	2(18.18)	3 (8.82)	0.080
Infection	25(55.55)	1(5.0)	24 (96.0)	7(15.6)	0(0.0)	7(20.6)	0.001
Septicemia	9(20.0)	9(45.0)	0(0.0)	4(8.9)	4(36.36)	0(0.0)	0.001
ARDS	2(4.44)	2(10.0)	0(0.0)	2(4.44)	2(18.18)	0(0.0)	0.005
MODS	7(15.55)	7(35.0)	0(0.0)	3(6.66)	3(27.27)	0(0.0)	0.001
DCM	1(2.22)	1(5.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0.165

Among pregnant women 40.0% conservatively healed, no early excision and graft done, split thickness skin graft (STSG) done in 32.0%, flap done in 8.0%, surgery deferred up to delivery of baby in 20.0% cases. Among non- pregnant women 44.2% conservatively healed, 8.8% early excised and grafted, in 28.2% STGS done, in 8.8% cases flap coverage was required.

Table 14: Distribution of wound management and surgery performed among pregnant and non-pregnant women (n=69)

Wound management	Pregnant Women (n=25)	Non- Pregnant Women (n=34)
Conservatively healed	10(40.0)	15(44.2)
Early excision and graft	0(0.0)	3(8.8)
STSG	8(32.0)	13(38.2)
Flap	2(8.0)	3(8.8)
Surgery deferred up to delivery of baby	5(20.0)	0(0.0)

Mean duration of hospital stay was lower in non –pregnant than pregnant patients.

Table 15: Duration of hospital stay between pregnant and non-pregnant women (N=90)

Duration of hospital stay(in day)	Pregnant Women (n=45)	Non-Pregnant Women (n=45)
1-30 days	14(30.0)	30(66.7)
31-60 days	14(30.0)	5(11.1)
61-90 days	14(30.0)	10(22.2)
91-120 days	3(10.0)	0.0
Mean ± SD days	32.60±18.26	22.50±15.36

DISCUSSION

Burn injury in the developing countries is a social issue. Pregnant women constitute one of the most significant high-risk groups with burn injuries because of the typically large burn sizes involved and the often-severe medical consequences to the woman and the fetus. Hence, it is directly related to the extent of the maternal thermal injury. Burn injury in developing countries is closely associated with the use of lamps during cooking, especially at night; it is also a public health issue because its incidence is increasing and has a devastating effect on the patient, the fetus, family, as well as the community as a whole [10]. In this study the mean age of the participants were reported for pregnant women (25.09±7.04) which is higher compare to our previous study in same institution [11] and a study in Iran [2] where mean age was 23.73 and 23.51 respectively but lower than other study in Nigeria (30.68) [12] Mean age of non-pregnant women was (26.71±8.30). 86.7% pregnant and 82.2% non-pregnant women were found accidental burned, while 13.3% pregnant and 17.8% non-pregnant women had suicidal burn. Percentage of Suicidal burn is more in study in Iran [13]. In this study death rate was 44.4% in pregnant and 24.4% in non-pregnant burn patients. While in other study by Ogbogu *et al.,* the mortality rate is almost three times (30%: 11.1%) the rate of non-pregnant women [12]. The total maternal mortality rate in study by Mishra S *et al*., [14] and Akhtar M A *et al.,* [15] was 46.6% and 70% respectively, while other studies reported a maternal mortality rate between 28.3 and 63% [15-17]. Assessment of fetal outcome of pregnant women shows, 57.8% fetus was alive while 42.2% fetus died. Fetal death was higher in study by Akhtar *et al.,* [15] and Mehdizadeh *et al.,* [16] who demonstrated a fetal mortality rate of 72 % and 72.8 % respectively. Among alive fetus 46.2% pregnancy continued, 42.3% underwent normal vaginal delivery (NVD), LUCS was reported 11.5%. 36.8% fetus died with maternal death, abortion was reported 36.8%, IUD was reported 15.9%, and still birth was reported 10.5%. This result is comparable with other studies at same institution [11, 18]. Among 13.3% of 1st trimester pregnant woman 5% reported dead and 20.0% reported alive, among 40.0% of 2nd trimester pregnant women 30.0% reported dead and 48.0% reported alive, among 46.7% of 3rd trimester pregnant women 46.7% reported dead and 32.0% reported alive. Mishra *et al.,* reported that, in the first trimester, fetal loss largely depended on maternal survival; three women survived and no fetuses were alive. The percentage of fetal deaths was high in the first and second trimesters [14]. Gronert and Theye [19], Yingbei *et al.,* [20], and McCauley *et al.,* [21] reported that second and third trimester burns may be lethal to the fetus. In this present study a highly significant relationship (p=0.001) found between total body surface area (TBSA) and Maternal outcome among both pregnant & non-pregnant woman, as well as fetal outcome (p=0.028).Death occurred in all patients with more than 40% TBSA burn both pregnant and non-pregnant. Some earlier studies had suggested that the TBSA is the only statistically important factor that affects the prognosis of the mother and fetus [22]. On the other hand, there is a direct relationship between the total burn surface area (TBSA) and fetal viability: Fetal mortality is about 2.5% when the TBSA is 30% and 62.5% when the TBSA is 50% [19]. According to burn complications among pregnant and non-pregnant women, among pregnant women 20.0% shocked, 55.6% wound infected, 33.3% found septicaemia, 17.8% found ARDS, 15.55% found MODS, 55.6% died. Among non-pregnant women, 11.11% had shock, 44.4% had wound infection, 17.8% had septicaemia, and 6.7% had ARDS, 8.88% suffered from MODS and 24.4% reported dead. According to causes of death in pregnant women 15.0% reported irreversible burn shocked, 45.0% found septicemia, 25.0% reported MODS, 10.0% reported ARDS and 5.0% reported DCM, in non-pregnant women 18.8% reported irreversible burn shock, 36.4% had septicemia, 27.27% suffered from MODS, 18.2% reported ARDS and no DCM found. 8.0%, surgery was differed up to delivery of baby in 20.0% cases. Among non-pregnant women 44.2% conservatively healed, in 8.8% cases early excision and graft done, 28.2% needed secondary STGS and 8.8% cases needed flap. This is shown by the fact that all fetal losses occurred during the first trimester and the first week after the burn. The results of Chandra *et al.,* and Zhang *et al.,* [23, 24] are comparable. While fetus born after 32 weeks will perform well with current neonatal intensive care, which are essential to preserve a near-term fetus, those delivered before 24 weeks would often not survive [25]. It is further emphasizing that, especially in patients with burns covering more than 60% of TBSA, prompt surgical techniques and urgent resuscitation may be able to save a live fetus [26].

LIMITATIONS OF THE STUDY

This study is a single center based study during a small period of time which may not represent the situation of whole country. Analysis of data collected from multiple centers should have been done to get the actual picture of the scenario. Outcome would be improved if early aggressive surgical intervention was

done which is not always possible in our country due to social stigmata as well as lack of facilities**.**

CONCLUSION

Burn in pregnancy is not uncommon in a developing country like ours. Accidental flame burn during household activities is most common aetiology. It can be prevented by community education about burn and household safety measures. The risk of maternal and fetal survival is increased by thermal damage. Fetal outcome is strongly correlated with maternal outcome. Maternal outcome may be influenced by fetal presence. The incidence of maternal and fetal death is directly proportionate to % of TBSA and presence of complications. The first and second trimesters had the greatest rates of fetal death, which decreased in the third trimester as the gestation period came close to an end. Prevention of burn , immediate first Aid management if burn occurs , early hospitalization, prompt and adequate fluid resuscitation ,extensive monitoring, early identification and management of complications like inhalation injury, infection and sepsis using multidisciplinary team approach is essential to reduce morbidity and mortality of burn with pregnancy.

REFERENCES

1. Mabogunje, O. A. (1990). Burn injuries during pregnancy: an African series. *Journal of the National medical association*, *82*(9), 641-644. PMID: 2213912; PMCID: PMC2626994.
2. Rezavand, N., & Seyedzadeh, A. (2006). Maternal and foetal outcome of burns during pregnancy in Kermanshah, Iran. *Annals of burns and fire disasters*, *19*(4), 174-174. PMID: 21991046; PMCID: PMC3188112.
3. Karimi, H., Momeni, M., Momeni, M., & Rahbar, H. (2009). Burn injuries during pregnancy in Iran. *International Journal of Gynecology & Obstetrics*, *104*(2), 132-134. DOI: 10.1016/j.ijgo.2008.10.003.
4. Mokube, J. A., Verla, V. S., Mbome, V. N., & Bitang, A. T. (2009). Burns in pregnancy: a case report from Buea Regional Hospital, Cameroon. *The Pan African medical journal*, *3*, 21. PMID: 21532730; PMCID: PMC2984292.
5. Available from: https://www.paho.org/en/topics/maternal-health.
6. Trends in maternal mortality: 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Geneva: World Health Organization; 2019.
7. Kennedy, B. B., Baird, S. M., & Troiano, N. H. (2008). Burn injuries and pregnancy. *The Journal of perinatal & neonatal nursing*, *22*(1), 21-30. DOI: 10.1097/01.JPN.0000311871.46075.3d.
8. El-Gallal, A. R. S., & Yousef, S. M. (2002). Burns in pregnancy: A ten-year review of admitted patients. *Annals of Burns and Fire Disasters*, *15*(3), 113-115.
9. Available from: https://www.who.int/news-room/fact-sheets/detail/maternal-mortality.
10. Pasalar, M., Mohammadi, A. A., Rajaeefard, A. R., Neghab, M., Tolidie, H. R., & Mehrabani, D. (2013). Epidemiology of burns during pregnancy in southern Iran: Effect on maternal and fetal outcomes. *World Appl Sci J*, *28*(2), 153-158. DOI: 10.5829/idosi.wasj.2013.28.02.81217.
11. Khondker, S. N., Mohiuddin, S. M., & Awwal, R. (2021). Maternal and Fetal Outcome of Burn with Pregnancy: A Prospective Observational Study at a Tertiary Burn Hospital. *Journal of Surgery and Research*, *4*(4), 765-777.
12. Ogbogu, C. J., Uduezue, A., Anetekhai, W. I., & Agunwa, C. C. (2018). Burn injuries in pregnancy in a regional burns center in Nigeria: presentation, maternal and fetal outcome. *Burns Open*, *2*(1), 53-58. doi: 10.1016/j.burnso.2017.11.001
13. Pasalar, M., Mohammadi, A. A., Rajaeefard, A. R., Neghab, M., Tolidie, H. R., & Mehrabani, D. (2013). Epidemiology of burns during pregnancy in southern Iran: Effect on maternal and fetal outcomes. *World Appl Sci J*, *28*(2), 153-158.
14. Mishra, S., Sapre, S., Chandwaskar, N., & Sahu, R. (2021). Assessment of Maternal and Fetal Outcomes of Burn in Pregnancy. *Journal of South Asian Federation of Obstetrics and Gynaecology*, *13*(4), 227.
15. Akhtar, M. A., Mulawkar, P. M., & Kulkarni, H. R. (1994). Burns in pregnancy: effect on maternal and fetal outcomes. *Burns*, *20*(4), 351-355. DOI: 10.1016/0305-4179(94)90066-3.
16. Mehdizadeh, A., Akbarian, A., Samareh, P. P., Tavajjohi, S., MacKay, R. A., Alaghehbandan, R., & Groohi, B. (2002). Epidemiology of burn injuries during pregnancy in Tehran, Iran. *Annals of burns and fire disasters*, *15*(4), 163-169.
17. Khadzhiĭski, S. (1991). Burns during pregnancy. *Khirurgiia Sofia*, 44(3), 26-29. PMID: 1895705.
18. Tasnim, F., & Sultana, N. (2016). Burns in Pregnancy-Studies and Observations. *BDJPS*, 7, 34-37
19. Gronert, G. A., & Theye, R. A. (1975). Pathophysiology of hyperkalemia induced by succinylcholine. *Anesthesiology*, *43*(1), 89-99. DOI: 10.1097/00000542-197507000-00018.
20. Ying-bei, Z., Ying-jie, Z., & Xuewei, W. (1982). Burns during pregnancy: an analysis of 24 cases. *Burns*, *8*(4), 286-289. DOI: 10.1016/0305-4179(82)90011-0.
21. McCauley, R. L., Stenberg, B. A., Phillips, L. G., Blackwell, S. J., & Robson, M. C. (1991). Long-term assessment of the effects of circumferential truncal burns in pediatric patients on subsequent pregnancies. *The Journal of burn care & rehabilitation*, *12*(1), 51-53. DOI: 10.1097/00004630-199101000-00013.
22. Agarwal, P. (2005). Thermal injury in pregnancy: predicting maternal and fetal outcome. *Indian Journal of Plastic Surgery*, *38*(02), 95-99.

23. Chandra, G., Gaurav, K., Kumar, S., Yadav, S. K., Ranjan, R., Nambiar, M., ... & Yadav, S. (2016). Burns during pregnancy: A retrospective analysis of 19 cases. *Archives of International Surgery*, *6*(1), 28-31. DOI: 10.4103/2278-9596.187198.
24. Ying-bei, Z., Ying-jie, Z., & Xuewei, W. (1982). Burns during pregnancy: an analysis of 24 cases. *Burns*, *8*(4), 286-289. DOI: 10.1016/0305-4179(82)90011-0.
25. Banerjee, T., Karmakar, A., & Adhikari, S. (2012). Foetal salvage by Caesarean section in a case of maternal burn injury. *Singapore Med J*, *53*(11), e247-e248.
26. Rölfing, J. H., Jensen, P. E., & Lindblad, B. E. (2010). Second-degree burn in a pregnant woman. *Ugeskrift for Laeger*, *172*(40), 2770-2771. PMID: 20926050.