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Original Research Article

Maternal and Fetal Outcome in Second and Third Trimesters of Pregnancy with Burn

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Abstract

***Introduction*:** Burns in pregnancy is common in Bangladesh. Burns are a major, global public health problem, resulting in an estimated 195,000 deaths annually. The majority of burns occur in low-and middle-income countries, with almost half occurring in the World Health Organization (WHO) South-East Asia Region. ***Objective*:** To assess the maternal and fetal outcome in second and third trimesters of pregnancy with burn. ***Methods*:** This is a retrospective study was conducted in Burn and plastic surgery unit Dhaka Medical College Hospital, Dhaka, Bangladesh from March to May 2022. Total 28 patients admitted were included. The data was collected on the basis of age, percentage of burn over the body surface, gestational age, maternal and foetal outcome. All admitted patients having burn with live pregnancy was included in the study and epidermal burn and burn with other severe co-morbidities were excluded from the study group. All patients were informed about the study. Then those patients willing to take part in the study were included. ***Results*:** Total 28 patients (3.1% of female burn patient of childbearing age), having burn with Pregnancy were included in this study fulfilling the inclusion and exclusion criteria. Among 28 patients, 10 (35.7%) patients were in age group 15-20 years followed by 11 (39.3%) in age group 21-25 years, 5 (17.8%) in age group 26-30 and 1 (3.6%) patient each was in age group 31-35 years and 41-45 years group. Age range was 16-45years. 96.4% burn Accidental and 3.6% burn Suicidal. Among 28 patients, 16 (57.1%) were survived after treatment and 12 (42.9%) patients died. The causes of death were septicemia and MODS in maximum cases. Fetal outcome shows, 16(57.1%) fetus were survived. Of them 8 pregnancy continued till discharge, 8 babies were delivered during treatment period (6 by normal vaginal delivery, 2 by caesarian section). 12 (42.9%) fetal death occurred. Among them 5 fetus died with maternal death, 1 intrauterine death follower by normal delivery and 1 still birth occurred. ***Conclusion*:** Most burns with pregnancy are in the 16-30 years age group and accident was the major cause of injury. Inhalation injury, burn related complications like burn shock, septicemia and infection are major factors responsible for maternal and fetal mortality. Early hospitalization, prompt and aggressive fluid management, proper management of suspected inhalation injury and early identification and management.

Keywords: Burns, Pregnancy, Trimesters, Outcome.

INTRODUCTION

Burns in pregnancy is common in Bangladesh. Burns is a major, global public health problem, resulting in an estimated 195,000 deaths annually. The majority of burns occur in low-and middle-income countries, with almost half occurring in the World Health Organization (WHO) South-East Asia Region. Women in the WHO South-East Asia Region have the highest rate of burns and account for 27% of global burn deaths and nearly 70% of burn deaths in the region [1,2]. Burns during pregnancy presents special management problems during pregnancy due to highly susceptible status of both mother and fetus to external stressful conditions. Various factors can affect the rate of mortality and morbidity in burned patients during pregnancy, including the depth and size of burn injury, age at pregnancy, maternal health, and simultaneous existence of inhalation and burn injuries [3]. Human physiology alters during pregnancy and adds further stress to systems that are highly modified. Close cooperation between the surgical and the obstetric

teams and individualization of management are always necessary [4, 5]. Fetus is at high risk due to burns injury, which is often associated with a high. Urgent delivery has been considered the treatment of choice in term or near-term pregnant women with extended burn injury. Aggressive resuscitation and early control of the airway with obstetric management including early delivery of the fetus is vital for optimal maternal and fetal outcome. Aim of this study was to study the maternal and fetal outcome of acute surgical emergencies in pregnant women.

MATERIALS AND METHODS

This is a retrospective study was conducted in Burn and plastic surgery unit Dhaka Medical College Hospital, Dhaka, Bangladesh from March to May 2022. Total 28 patients admitted were included. The data was collected on the basis of age, percentage of burn over the body surface, gestational age, maternal and fetal outcome. All admitted patients having burn with live pregnancy was included in the study and epidermal burn and burn with other severe co-morbidities were excluded from the study group. All patients were informed about the study. Then those patients willing to take part in the study were included. Diagnosis of pregnancy was made by history and examination and confirmed by patient's previous medical and obstetric records and by abdominal ultrasound. As a routine protocol, obstetric consultation was sought promptly on admission for each pregnant patient. All pregnant patients were managed in the high dependency unit by the medical and surgical services including surgical dressings in consultation with the obstetrical service. In all patients the extent of burn was calculated by using Lund and Browder's chart. A burn less than 10% in total body surface area (TBSA) was considered as minor burn.

Initial resuscitation and burn management were done by standard protocol. No protocol has yet been established for management of pregnant women with burn in this department. All patients received appropriate burn care, including fluid resuscitation, wound care and nutritional support. Fluid resuscitation was done using Parkland's Formula. Additional 5% fluid was added if burn involved lower abdomen. Targeted urine output was 30-60 ml/hour. Maintained systolic BP>110 mm hg. Central line used in >20% burn. Nutritional support included daily intake of protein and calories according to the basal energy expenditure. After 24 hour Serum albumin done to maintain >3gm /l. Patients were treated with systemic antibiotics not harmful for baby when indicated. Wound swab for culture /sensitivity were done on 5th day/10th day/15day. Those patients who showed growth of organism were treated accordingly. In cases where bronchopneumonia developed, fetal-safe antibiotic were preferred. Every case was treated as individual.

Data were collected using a pre-designed data collection sheet. All information regarding history of illness, clinical examination, investigation results and follow-up were recorded in that data collection sheet (questionnaire). All data were compiled in a master table first. Computer based statistical analysis were carried out with appropriate techniques and systems. Quantitative data were expressed as mean and standard deviation, and qualitative data were expressed as frequency distribution and percentage. Statistical analysis was performed by using window based computer software devised with SPSS for Windows version 22.

RESULTS

Total 28 patients were included in this study. Among 10 (35.7%) patients were in age group 15-20 years followed by 11 (39.3%) in age group 21-25 years,5 (17.8%)in age group 26-30 and 1 (3.6%) patient each was in age group 31-35 years and 41-45 years group. No patient was in 35-40 year group. Age range was 16-45years. Mean age was 23.76±6.04 (Table-1). Table-2 shows that 96.4% burn Accidental and 3.6% burn Suicidal. Gestational age distribution shows 13 patients (46.4%) were in Second trimester of pregnancy, 15(53.6%) patients were in third trimester of pregnancy (Table-3). Maternal and fetal outcome was noted. Among 28 patients, 16 (57.1%) were survived after treatment and 12 (42.9%) patients died. The causes of death were septicemia and MODS in maximum cases (Table-4). Fetal outcome shows, 16(57.1%) fetus were survived. Of them 8 pregnancy continued till discharge, 8 babies were delivered during treatment period (6 by normal vaginal delivery, 2 by caesarian section). 12 (42.9%) fetal death occurred. Among them 5 fetus died with maternal death, 1 intrauterine death follower by normal delivery and 1 still birth occurred (Table-5).

Table 1: Distribution of patients according to age (n=28)

Age (years)	Frequency (n)	Percentage (%)
15-20	10	35.7
21-25	11	39.3
26-30	5	17.8
31-35	1	3.6
36-40	1	3.6

Table 2: Distribution of patients according to mode of burn (n=28)

Mode of burn	Frequency (n)	Percentage (%)
Accidental	27	96.4
Suicidal	1	3.6
Total	28	100

Table-3: Distribution of patients according to gestational age (n=28)

Gestational age	Frequency (n)	Percentage (%)
Second trimester	13	46.4
Third trimester	15	53.6
Total	28	100

Table-4: Distribution of patients according to maternal outcome (n=28)

Maternal outcome	Frequency (n)	Percentage (%)
Alive	16	57.1
Dead	12	42.9
Causes of death		
Septicemia	6	21.4
MODS	5	17.9
ARDS	1	3.6
DCM	1	3.6

Table-5: Distribution of patients according to fetal outcome (n=28)

	Fetal outcome	Frequency (n)	Percentage (%)
Alive fetus (n=16, 57.1%)	Continued pregnancy	8	28.6
	NVD	6	21.4
	LUCS	2	7.1
Dead fetus	Maternal death	5	17.9
(n=12, 42.9%)	Abortion	5	17.9
	IUD	1	3.6
	Still birth	1	3.6
Total 28		28	100

DISCUSSION

This study was carried out to assess the maternal and fetal outcomes in pregnancies complicated by burns. Major degree of burns causes both increased capillary permeability and inhalational injury to the maternal airway; this leads to maternal hypotension and respiratory insufficiency, causing reduction in the uterine blood flow and decreased supply of oxygen, leading to fetal hypoxia and acidosis. This incidence rate may be underestimated because a pregnancy test is not routinely done in burned women of reproductive age. Distribution of study subjects by age group is similar to study in the same center in 2014 [13], where Majority of the patient of 2nd decade, and an Indian study where mean age was 23.08 years [14]. Low educated patients have minimum awareness about safety measures against burn, poor knowledge about health care during pregnancy and primary management of burn wound which may contribute to increase incidence and extent of burn and may lead to poor outcome of burn injury. The condition of hypotension and acute respiratory insufficiency is further accompanied by septicemia. Hypovolemia with hypoxia and the synthesis and release of prostaglandins from the skin in the burn area lead to spontaneous miscarriage and premature delivery. The maternal and fetal outcome was inversely associated with the severity of TBSA of the patients in our study as it was seen in other studies also [6, 7]. Out of total 28 patients, 25(89.9%) patients were housewives. 26 patients (92.8%) suffered from flame burn. 0nly one patient had chemical burn and one had electric burn. This result is similar to study in the same centre in 2014 [8], where 93.33% patients had flame burn and rest of them had scald burn. Similar result was also demonstrated in studies conducted in India [4, 9], Iran [10] and Iraq [11]. All burn cases were accidental in nature except one which was suicidal. This result is similar to maximum studies [4, 13]. This is probably because of increasing familial stress due to day to day problems like, cooking with an open unguarded fire, rearing of smaller children, overburdened household activities and living in an overcrowded space with minimal amenities inviting frequent accidents. Among 28 patients, 10(35.7%) patients were in age group 15-20 years followed by 11 (39.3%) in age group 21-25 years, 5(17.8%)in age group 26-30 and 1 (3.6%) patient each was in age group 31-35 years and 41-45 years group. No patient was in 35-40 year group. Age range was 16-45years. Mean age

was 23.76±6.04. Mago V et al conducted a study in India, in his study, out of 1200 patients admitted with burns, 384 cases (32%) were pregnant women in the age range of 19-35 [12]. Maximum 15(53.6%) patients were in third trimester, followed by 13(46.4%) in Second trimester of pregnancy. A previous study in same burn unit shows 53.6% women were in 3rd trimester, 33% women were in 2nd trimester [9]. A retrospective study in India including 49 patients showed, gestational age at the time of injury varied from 8 weeks to 34 weeks with 11 cases in first trimester, 21 in second trimester and 17 patients in last trimester [10]. In other study TBSA of the burned pregnant women ranged from 10%-72% and the majority of burns ranged between 20%-30% [9]. In an Indian study the percentage of TBSA varied from 8 % to 100% (mean±71.47%) [10]. Maternal and fetal outcome was recorded. Among 28 patients, 16 (57.1%) were survived after treatment and 12 (42.9%) patients died. The causes of death were septicemia and MODS in maximum cases. Fetal outcome shows, 16(57.1%) fetus were survived. Of them 8 pregnancy continued till discharge, 8 babies were delivered during treatment period (6 by normal vaginal delivery, 2 by caesarean section). 12 (42.9%) fetal death occurred. Among them 5 fetus died with maternal death, 1 intrauterine death follower by normal delivery and 1 still birth occurred. Other local study shows, out of 30 mothers, 12 mothers survived with their fetus. Out of these, 08 burned women had good outcome with discontinuation of pregnancy. In an Indian study, among 49 thermally injured pregnant women in five years, there were 33(67.34%) maternal deaths and 34(69.39%) fetal deaths [10]. An 8 years long study in Iran shows Maternal death occurred in 12 of the 39 patients (30.8%) [10]. Fetal death occurred in 15 (38.5%) of the cases [11]. In this study an attempt was made to find out the factors which are related with maternal and fetal outcome. Relationship between gestational age with maternal and fetal outcome was assessed. Maximum maternal (69.2%) and fetal (76.9%) mortality was observed among the mother in 2nd trimester, but increasing gestational age was significantly related with increase in maternal death but not with fetal death. This result is similar to some studies [4, 10], but dissimilar with other studies [9, 10]. This study shows that there is significant relationship between percentage of burn with maternal and fetal mortality. Another study shows, and a 50% burn was found to be critical to the finding of maternal and fetal mortality [11], as it was true in some other studies [14-18]. The sample size was small in the present study. In this study, none of the patients underwent early excision and skin grafting. If it was possible it could have influenced the result.

CONCLUSION

Most burns with pregnancy are in the 16-30 years age group and accident was the major cause of injury. Inhalation injury, burn related complications like burn shock, septicemia and infection are major factors responsible for maternal and fetal mortality. Early Hospitalization, prompt and 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.

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