

Burns with Pregnancy

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Introduction

MEDICAL literature contains very few references on the problems of burnt pregnant patients and whatever findings have been reported are based on statistically inadequate number of patients.

Department of Burns, Plastic and Maxillofacial Surgery, Safdarjang Hospital, New Delhi attends to about 2500 cases of burns a year. Averagely 600-700 cases are treated as inpatient. 200 pregnant patients treated during the period 1967-76

are presented here in this study.

Materials and Methods

Case records of 200 burnt pregnant patients were studied and analysed. Case records of another 200 female non-pregnant patients who were similar in age, percentage and depth of burns were also studied, analysed and were considered as controls. Cases were grouped trimester wise and observations recorded are as follows :

(1) First Trimester :

Table 1

Total number of cases—70

Percentage of burns	No. of cases	No. of cases aborted	No. of cases died
10-20%	16	0(0%)	0(0%)
21-40%	20	5(25%)	3(15%)
41-60%	14	7(50%)	5(35.7%)
61-100%	20	18(90%)	17(85%)

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(2) Second Trimester :

Table 2

Total number of cases—100

Percentage of burns	No. of cases	No. of cases aborted/had premature labour	No. of cases died
10-20%	22	2(9%)	1(4.5%)
21-40%	18	5(27.7%)	4(22.2%)
41-60%	26	15(57.7%)	11(42.3%)
61-100%	34	32(94.1%)	30(88.2%)

(3) Third Trimester :

Table 3

Total No. of cases – 30

Percentage of burns	No. of cases	No. of cases who had premature labour	No. of cases died
10-20%	8	2(25%)	0(0%)
21-40%	4	3(75%)	1(25%)
41-60%	7	7(100%)	3(42.82%)
61-100%	11	11(100%)	10(90.0%)

(4) Control cases (non-pregnant women) :

Table 4

Total number of cases—200

Percentage of burns	No. of cases	Cases died	Mortality rate in percentage
10-20%	46	2	2.2
21-40%	42	5	11.9
41-60%	47	13	27.7
61-100%	65	39	60.0

Overall mortality rate in control cases = 29%.

Observations

(A) Effects of Burns on pregnancy and the foetus (Table 1 to 3)

10-20% Burns did not produce any ill effects on the pregnancy in the first trimester. During the second trimester it lead to abortion in 2 out of 22 cases. During the third trimester it lead to premature labour in two cases out of eight within the first two days of sustenance of burns. Babies in both the cases though underweight were viable and survived after nursing in the nursery.

21-40% Burns led to abortion in 5 out of 20 cases in the first trimester group. During the second trimester (18 cases) 5 cases developed abortion/premature labour between first to 10th day of burns. All foetii were non-viable and about 60% were macerated. During the third trimester out of 4 cases, 3 went into premature labour within few hours to two days after the admission. Two babies were still births and third one was alive and survived.

41-60% Burns : out of the first trimester group (14 cases) 7 cases aborted mostly between 4th to 8th day of sustaining the burns. In the second trimester group (26 cases) 15 cases developed abortion/premature labour within 2-10 days after the burns. Foetii were macerated in majority of the cases. During the third trimester (7 cases) all the 7 cases went into premature labour within few hours to two days of the sustenance of burns. Foetal mortality in this group was 100%.

60-100% Burns : In the first trimester (20 cases) 18 had abortion within 4 to 48 hours. During the second trimester (34 cases) 32 cases went into premature labour within 24-36 hours. Majority of foetii were macerated. In the third trimester (11 cases) all the two cases developed premature labour within few hours and only two babies could be resuscitated and those survived.

It is worth noting that the foetii in most of the cases were macerated indicating their death much earlier than they were expelled.

(B) Effects of pregnancy on Burns Mortality (Table 1 to 4)

(i) On 10-20%

Against a mortality rate of 2.2% in control cases, death rates in the study cases in first, second and third trimester were 0%, 4.5% and 0% respectively. However, overall death rate irrespective of stage of pregnancy was again 2.2% in study cases also. This shows that there was no adverse effect of pregnancy in patients with 10-20% of burns.

(ii) On 21-40%

In these patients mortality rated 15%, 22.2% and 25% during the first, second and third trimester respectively. In comparison the control cases revealed 11.9% deaths rate. Irrespective of stage of pregnancy the overall mortality rate was about 19% as compared to 11.9% in control cases. Thus there was an enhancement of mortality rate by about 8% in

pregnant case.

(iii) **On 41-60%**

The death rates in the study cases in first, second and third trimesters were 35.9%, 42.3% and 42.8% respectively. Irrespective of stage of pregnancy, overall mortality rate in the study cases was about 40% as compared to 27.7% in control cases. Therefore with 41-60% burns pregnancy enhanced the mortality rate by about 12.3%.

(iv) **On 61-100%**

Cases in first, second and third trimesters respectively revealed in 85%, 88.2% and 90.9% mortality rates as compared to 60% in the control cases. Overall enhancement in mortality rate due to pregnancy in this category was about 27%.

Overall mortality rate in pregnant cases irrespective of percentage of burns and stage of pregnancy was 42.5% (85 out of 200 cases) as compared to 29% in non-pregnant cases. Therefore, pregnancy in burns carried about 13.5% additional death rate. Deaths commonly occurred between 4th day to 21st day after sustaining the burns.

Discussion

Inadequate experimental and clinical work on the problems of burns in pregnancy and vice-versa make it difficult to understand the effects of these two on each other and on the patient on the whole. Unfortunately literature lacks significant series to prove or disprove the

contentions and presumptions put forward to explain the effects enumerated. (Anson and Stage 1973; Schimitz 1977; Mulla 1958.

This statistical study of 200 cases of burns pregnant women highlights two effects very clearly. Firstly, as far as pregnancy is concerned burns precipitate abortions and premature labour on a very significant scale. Effects on the foetus are also very deleterious and precede abortion/premature labour. Abortions/premature labour start within few hours to about 7-10 days after sustaining the burns. Incidence of abortion/premature labour relates directly proportional to percentage of burns and greater the percentage of burns more quicker it results in these events.

Secondly, association of pregnancy with burns has also raised the maternal mortality in extensively burnt women. Death has commonly occurred on 4th to 21st day and in majority due to toxæmic features. However, we tend to agree with the feelings that healing of burn wounds has not been seen to be affected by pregnancy.

Mechanisms leading to these effects need extensive experimental and biochemical studies. We believe due to burns a massive turmoil in the body characterised by loss of fluids, shock, renal depression, electrolytes disturbances, protein loss, infection and metabolic and hormonal disturbances, and anoxia adversely affect both the foetus and the mother. It appears

foetus is affected much earlier than the pregnancy and the mother. What precisely precipitates abortion/premature labour is still enigmatic. However, factors which have been blamed to be responsible are increased serotonin levels, excessive loss of pitocinase in burns fluid and increased adrenocortical secretions (Mulla, 1958)

Experimental studies (Idem 1972, Jonsson 1971) have suggested that extracts of burnt skin contain huge quantities of prostaglandin E-2. It provides a more logical mechanism for precipitating

abortions/premature labour

A lipoprotein complex produced in lethal quantities due to burns is probably responsible for higher maternal mortality in extensive burns and kills foetus only in minor burns. We feel strongly that some more unspecified toxins liberated after the early death of the foetus may also be contributing to heavy maternal mortality.

These aspects are being studied by us and will be reported in a subsequent publication.

REFERENCES

1. Anson, H., Stage, F. : Severe burns in a pregnant patient. *Obst. and Gynae.*, 42 : 259, 1973.
2. Idem : Formation of prostaglandins in the skin following a burn injury. *Prostaglandins in cellular biology*. Vol. I, 269, 1972.
3. Schimitz, J.T. : Pregnant patient with burns. *Amer. J. Obst. & Gynae.*, 110 : 1, 57, 1971.
4. Jonsson, C.E. : Smooth muscle stimulating lipids in peripheral lymph after experimental burns. *Scand. J. Plast. Recons. Surgery.*, 5 : 1, 1971.
5. Mulla, N. : Labour following severe burns. *Amer. J. Obst. & Gynae.*, 76 : 6, 1338, 1958.