

MATERNAL MORTALITY AND INFECTIOUS MORBIDITY FOLLOWING CAESAREAN SECTION

By

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Introduction

In spite of considerable advantages, delivery by Caesarean Section (CS) is fraught with danger to the mother. In the developed countries, maternal mortality following CS is very negligible, but morbidity is still significantly higher compared to vaginal delivery. In contrast, in the developing countries one does come across maternal mortality and alarmingly high infectious morbidity following CS. Various factors which predispose to post caesarean infectious morbidity, have been identified, but few studies have attempted to find place and prognostic significance of these various factors. This prompted us to report our experience in changing trends in maternal mortality and infectious morbidity following C.S. over the last 16 years.

Material and Methods

The patient material consisted of women undergoing C.S. during the 4 study period over the last 16 years (1971-86), at LHMC, New Delhi. The study period (1st August to 31st July) was chosen at interval of 4-5 years (i.e. 1971-72, 1976-77, 1981-82, 1985-86) to evaluate the changing trends brought about by multifaceted strategies to combat post caesarean morbidity and mortality. The data was

collected prospectively in last 3 study period on preset proforma which included identification data, details of pregnancy and labour, indication of C.S., maternal post caesarean infectious morbidity, perinatal outcome. Correlation of various risk factors modifying post caesarean infectious morbidity was studied in depth by analysing consecutive 300 caesarean sections only by analysis of variance. Fever index: was defined as a fever in excess of 38°C on atleast 2 readings taken 8 hours apart, excluding the first 24 hours post-operatively.

Wound infection: Cellulitis or exudate with or without fever. Refractory fever: denoted postoperative fever which did not respond to first line of antibiotic therapy. Criteria of endometritis and UTI was taken as positive cervical and urinary culture respectively.

Results and Discussion

Table I shows the incidence of C.S. over last 16 years. It is of interest to note that in early 1970's, the C.S. rate was less than 5%. It rose to 8% in 1976 and remained static for almost a decade with slight upward trend in last 2 years. Apart from all scientific reasoning, each time this change is attributed to induction of newer faculty to the department with obviously more liberal approach to C.S. However sequence and proportion of various indication has remained relatively unchanged over last 16 years (Table II).

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TABLE I
Incidence of C. Section at LHMC, New Delhi
(1971-86)

Year	No. of deliveries	No. of Caesarean Section	Caesarean Section rate
1971	6010	292	4.85
1976	5904	478	8.09
1981	8445	631	7.47
1982	8991	747	8.30
1983	9637	870	9.02
1984	10212	745	7.29
1985	11010	1088	9.88
1986	10875	1249	11.48

Table III shows that multiple adverse and high-risk factors were operating in large number of C.S. cases. However, it is heartening to note a decreasing trend in

number of unbooked and anaemic mothers. Due to unexplained reason, cases with bad obstetric history and rupture of membrane over 12 hours showed a rise. Incidence of obstructed labour remained unchanged and formed a very small group. However, it posed maximum problem in terms of high infectious morbidity and even maternal loss following C.S.

Table IV shows that maternal mortality rate (MMR) in C.S. has shown no declining trend at LHMC over the last 16 years and figures around 0.24% in 1980's. This figure is no different from 0.32%. MMR in CS during 1975-83 reported from Safdarjung Hospital, New Delhi Sengupta and Gode, 1987). Review of MMR in C.S. from different part of India shows the range, varying between 0.5-2%, which is at

TABLE II
Trends in Indication of Caesarean Section

Year	1971-72 %	1976-77 %	1981-82 %	1985-86 %
* C. section rate	4.85	8.09	7.81	10.67
* Repeat	14.8	21.75	20.38	24.47
* Primary				
Dystocia	24.89	18.82	23.78	22.66
F. Distress	14.53	21.96	20.08	21.65
Malpresentation	10.71	17.75	15.06	11.88
Antepartum haemorrhage	15.91	13.38	12.13	8.21

TABLE III
Profile of Maternal Factors (1971-86)

Maternal factors	1985-86 %	1981-82 %	1976-77 %	1971-72 %
Unbooked	36.00	48.00	41.84	58.22
Emergency operation	78.94	88.30	87.24	83.40
BOH	19.76	12.80	10.60	11.30
Moderate to severe anaemia	19.08	31.90	24.00	—
In labour > 24 hrs.	11.03	16.39	10.87	16.94
PROM > 12 hrs.	23.14	17.23	—	—
Prepartal fever	15.80	11.11	—	—
Obst. labour	3.29	3.98	3.13	2.76

TABLE IV
Maternal Mortality in Caesarean Section

Year	Total C.S.	Mat. deaths in C.S.	MMR in C.S.	Cause of death
1971	292	1	0.34	Haemorrhagic shock (PP)
1976	478	1	0.24	Uncontrolled sepsis (OL)
1981	631	1	0.15	Paralytic ileus with septicemia (OL)
1982	747	1	0.30	DOT, shock, cardiac arrest (OL)
1983	870	2	0.22	Eclampsia (OL) Haemorrhage shock (Twins)
1984	745	3	0.40	Haemorrhagic shock (PP) Endotoxic shock (OL)
1985	1088	3	0.27	Endotoxic shock-2 (OL, S. anaemia) Mendelson's syndrome
1986	1249	3	0.24	ARF and DIC following mismatched transfusion. DIC (OL, SPET, Prev. CS), Burst abd. (S. PET)

Since 1981—Total 13 = Sepsis 9, haemorrhage shock 2, Anaesthesia 1, BT—1.

least 10 to 40 times higher to western figures of 0.3 or 0.4 per 1000 C.S.

Analysis of causes of death in C.S. (Table IV) shows that most common cause of maternal mortality following CS

in 1980's has been sepsis which is responsible for 70% deaths. This is definitely at variance to figures in 1970's when sepsis and haemorrhage took equal toll of maternal deaths.

Table V shows the appreciable decline

TABLE V
Infectious and Maternal Morbidity After Caesarean Section

	1985-86 (N-540)	1981-82 (n-693)	1976-77 (N-478)
Shock	0.98		
Stress ulcer	2.96		
Fever index	15.18	37.80	43.93
High grade	4.81		
Low grade	10.37		
Refractory fever	2.59		
Wound infection	11.48	16.30	14.43
Wound dehiscence			
Superficial	5.74		
Deep (Resuturing)	2.40		
Burst abdomen	Nil		
Endometritis (culture +ve)	2.03		
Subinvolution	2.96		
UTI	1.11	7.07	21.12
Paralytic Ileus	2.40		
Pelvic masses	0.18		
Thrombophlebitis (Superficial)	11.11		
Overall infectious morbidity	17.96	40.40	52.92

in post-caesarean infectious morbidity over the last decade at LHMC as judged by fever index, wound infection rate, UTI, paralytic ileus and thrombophlebitis (from 53% in 1976-77 to 18% in 1985-86). This is achieved by routine use of prophylactic broad spectrum ampicillin instead of injection streptopenicillin, which had been used till 1982. In addition combined use of Ampicillin, gentamycin and I.V. metrogyl was done for potentially infected cases and obstructed labour. This strategy is important in view of recent studies which advocate that prophylactic antibiotics can reduce the incidence of post-caesarean infectious morbidity (Rothbard *et al* 1975, Kreutner *et al* 1979). However, Chaturvedi and Bhargava (1987) cautioned that unless an increased risk of infection after C.S. is demonstrated in local population, routine use of antibiotic prophylaxis should be discouraged. It is necessary to remember that all post-operative fever do not mean infection, but it is difficult to exclude infection for certain by any means presently available.

Endometritis is most common infectious morbidity, but majority of organism causing it respond to ampicillin and that is why positive cervical swab culture was less than 3% in this series inspite of that this investigation is done as routine. Further it is pertinent to note that negative aerobic culture does not rule out endometritis for certain as many pathogens causing endometritis are strict anaerobes, culture for which was not done in this study.

Postoperative distension, a quite common morbidity was seen in nearly 10% cases. The incidence is higher in prolonged labour. Majority are better in 48 hours of supportive and conservative treatment, only 2.5% persisted as paralytic ileus, but none required laparotomy. UTI as post-

caesarean morbidity has been brought down significantly by adopting the policy of avoiding catheterisation as far as possible in primary C.S.

Refractory fever always required vigorous reappraisal both clinically and bacteriologically (Table VI). In 3 cases, addition of gentamycin and I.V. metronidazole helped, while in 2 empirical use of very high dosage of penicillin made the women afebrile. We did not use heparin in any case for suspected pelvic thrombophlebitis. No case of drug fever figured in this series either.

TABLE VI

Refractory fever 14

Wound	2
UTI	3
Endometritis	3
Widal +ve	1
All culture sterile	5

Table VII summarised the risk factors that modify infectious morbidity. Most significant factor affecting infectious morbidity was found to be total duration of labour. The optimum time seems to be less than 12 hours. Other factors, seem to exert their influence primarily through duration of labour and secondarily only by their own as found by analysis of variance. No correlation was found with Surgeon's experience, type of anaesthesia (general anaesthesia V/S conduction block), primary V/S repeat C.S., and varying length of labour exceeding over 12 hours. Chaturvedi and Bhargava noted (1987) similar observations in retrospective study of 154 C.S. cases.

To conclude, it is emphasized that scrupulous hygiene in labour wards, a

TABLE VII
Risk Factors for Infectious Morbidity of Mother Afte Craesarean Section

(Analysis of Consecutive 300 Caesarean Sections)

Significant Correlation	No Correlation
* Unbooked	* Type of anaesthesia
* In labour	* Primary V/S repeat
* Duration of labour (> 12 hrs.)	* Surgeon's experience
* Duration of PROM (> 12 hrs.)	* Length of PROM over 12 hrs.
* > 3 P.V. exam. made before delivery and time elapsed from first P.V. to time of delivery.	
* Interference outside the hospital	
* Maternal pyrexia before and during labour	
* Moderate to severe anaemia	

short labour, fewer P.V. examination, strict follow up of standard infection control measure in and outside operation theatres and prophylactic use of broad-spectrum antibiotic i.e. ampicillin for emergency C.S. is required.

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