AN ANALYSIS OF 1237 CAESAREAN SECTIONS

(At the Nowrosjee Wadia Maternity Hospital From 1954 Through 1961)

by

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The great safety with which caesarean section can be undertaken today has greatly broadened the scope of this mode of delivery, so that it is now an accepted alternative to the more difficult vaginal manipulative delivery, which is more traumatic both to the mother as well as the foetus. The increased safety of this operation can be attributed to improved hospital facilities, availability of trained personnel, blood transfusion services and the wide range of antibiotics. Such an event was inevitable and was predicted by the earlier obstetricians.

D'Esopo (Sloane Hospital), in 1948, stated: "The matter of the caesarean section rate will be of considerable interest in the next five or ten years, for there appears now to be a definite tendency to broaden the indications. The greater safety of the operation makes this obvious". He stated that a certain number of easier mid-forceps will always be done, but predicted that the difficult traumatic mid-forceps operations would be relegated to the category of the obsolete procedures along with high forceps, the difficult destructive operations on the foetus, bags and bougies.

Dieckmann (Chicago Lying-in Hospital) in 1960, stated: "Caesarean section performed by a properly trained obstetrician is now a recognized procedure for the management of many obstetric and foetal complications formerly treated by vaginal delivery because the maternal mortality attributable to the operation itself is only 0.1% or less. The foetal mortality ascribable to the operation is less than 1.0%.

There is a tendency to expand the scope of this operation at most hospitals today. However, one must strike a note of caution. Every institution should review its practice annually to assess the results achieved, and guard against over-doing in the opposite direction, and considering that caesarean section offers an "Obstetric Panacea" and solution to all obstetric problems.

Material

The material presented is a review of the experience over an eight year period, from 1954 through 1961, at

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the Nowrosjee Wadia Maternity Hospital, which is a teaching hospital for undergraduate and postgraduate training.

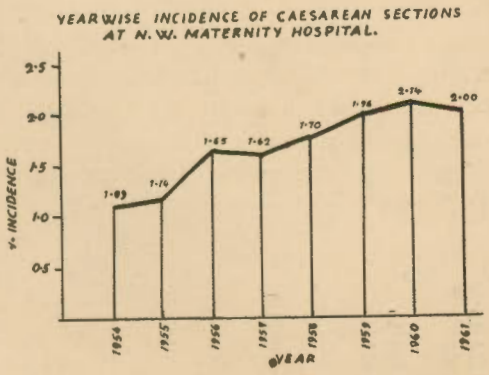
Results. Incidence

The question is often raised as to what is the acceptable incidence for caesarean sections in a teaching hospital. Mc Cormick, surveyed the practice of twenty teaching American clinics for a period of five years (1941-1945), and states an average incidence of 3.32%.

Cron considers an incidence of 5% to 5.5% the irreducible minimum. A survey of literature reveals wide variations in incidence quoted by different authors, ranging from less than 1% to over 8%. The incidence is higher in some private clinics as compared to teaching institutions.

In India, the incidence varies between 1% to 5% in most hospitals. The incidence at Nowrosjee Wadia Maternity Hospital has risen from 1.09% in 1954 to 2% in 1961, the highest recorded being 2.14% in 1960 (all the above figures being computed with reference to the total number of viable confinements).

GRAPH - I



The slow rise in caesarean section rate can be attributed to the increased number of sections being undertaken for foetal interests in many more cases of cord prolapse, placenta previa (specially the posterior types, with a positive Stallworthy's sign), and in some cases of abnormal presentations, where formerly internal podalic version was more often employed.

Indications

The cases were analysed under the following seven groups.

(i) Contracted pelvis and cephalopelvic disproportion, (ii) Antepartum haemorrhage, (iii) Abnormal presentation, (iv) Cord presentation and cord prolapse, (v) Abnormal uterine action, (vi) Cervical dystocia, and (vii) Miscellaneous, as shown under.

(i) *Contracted Pelvis and Cephalopelvic Disproporation*

These comprise the chief indication for caesarean section; an yearly analysis of cases revealed that whereas these accounted for 67.8% of all caesarean sections performed in 1954-57, they accounted for only 60% of all the caesarean sections in 1958-1961. The overall incidence over eight years is 63.1%. The fall in percentage incidence of this indication is relative, and not because of a reduction in the absolute number of patients with contracted pelvis. The fall in incidence can be explained on the basis of increased caesarean sections undertaken for other indications like placenta previa, cord prolapse and abnormal presentations.

A detailed analysis of the cases

TABLE I

Indications

Year	Total No. of C.S.	Contracted Pelvis & C.P.D.		Antepartum Haemorrhage		Abnormal Presentations		Cord Prest. and Prolapse		Abnormal Uterine Action		Cervical Dystocia		Miscellaneous	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1954 to 1957	489	332	67.8	51	10.4	34	7.0	18	3.6	25	5.1	18	3.6	11	2.3
1958 to 1961	748	450	60.0	90	12.0	79	10.5	54	7.3	23	3.0	32	4.3	20	2.7
Total	1237	782	63.1	141	11.4	113	9.1	72	5.8	48	3.8	50	3.9	31	2.5

grouped under this indication revealed that in the last five years 51.6% of all such cases were given a trial labour of varying duration before being subjected to caesarean section. In 32.3% of cases a previous caesarean section for contracted pelvis or disproportion was an added factor for subsequent repeat section. At operation the uterus showed imminent rupture or actual rupture in 3.5% of cases. In 12.7% of the cases there existed an added complication besides pelvic contraction like elderly primigravidity, breech presentation, transverse lie, or foetal distress. With a tendency to broaden the indications for caesarean section, there is a rise in rate of primary caesarean section, which is reflected in rising incidence of repeat caesarean section in subsequent years, this fact is already coming to the forefront and is probably responsible for the high repeat section rate evidenced in 1961 as shown below.

A review of American literature reveals that contracted pelvis and disproportion do not feature very prominently in their lists of indications, and account for only 15% to 30% of their cases in contrast to the 50% to 70% in our country. Also the most prominent feature in their lists is a history of previous caesarean sections as shown under.

TABLE II

Detailed Five Year Analysis of Cases of Contracted Pelvis & C.P.D.

Year	Total cases of contracted pelvis	Contracted pelvis and failed trial of labour		Contracted pelvis and previous C.S.		Contracted pelvis and rupture uterus		Contracted pelvis and other complications	
	Total	Total	%	Total	%	Total	%	Total	%
1957	94	48	51.0	28	29.8	6	7.0	12	14.0
1958	101	59	58.4	31	30.6	1	1.0	10	12.8
1959	116	62	53.4	32	27.6	7	6.0	15	12.0
1960	109	64	58.7	29	26.6	2	1.8	14	10.0
1961	123	45	36.6	58	47.2	2	1.6	18	14.0
Average		51.6%		32.3%		3.5%		12.7%	

TABLE III

Authors	Incidence of previous caesarean section	Incidence of contracted pelvis and C.P.D.
1. Posner, Cohn & Posner (1943-1951) ..	27.30%	22.30%
2. Diddle et al.	28.00%	17.60%
3. Zarou (1944-1951)	31.25%	28.25%
4. Lamkee et al. (1950-1956)		
(i) King County Hospital	62.50%	11.50%
(ii) Maynard Hospital	50.60%	16.50%
5. Average of eight authors quoted by Posner	26.32%	33.34%
6. Authors	19.38%	40.02%

In India the incidence of repeat caesarean section is lower as compared to the American clinics, owing to the lower incidence of primary caesarean sections, and the usual practice of giving a reasonable trial of labour to all cases who have had previous caesarean section, many of whom deliver vaginally.

The incidences of repeat caesarean section quoted by some of the Indian authors are as follows:—

TABLE IV

Authors	Total No. of caesarean section	Total repeat caesarean section	Percentage incidence
1. Roy (National Medical Institute, Calcutta)	60	21	35.0%
2. Bhowmik (Eden Hospital) ..	549	184	33.5%
3. B. Sen Gupta (Chittaranjan Seva Sadan Medical College and Hospital)	255	100	39.02%
4. Poddar (N.R.S. Medical College)	281	75	23.05%
5. Patwardhan & Motashaw ..	138	32	23.25%
6. Narvekar	103	25	24.3%

The lower rate of caesarean sections for contracted pelvis in American clinics may be probably due to the superior average build and state of nourishment of their patients, and the higher incidence of repeat caesarean sections the result of two factors, first, a higher incidence of primary caesarean sections, and secondly the belief in many clinics in the slogan "Once a caesarean always a caesarean".

(ii) *Antepartum Haemorrhage*

This is the second in importance amongst the indications for caesarean section; over a period of eight years it accounted for 11% of the total number of caesarean sections performed. According to D. Hunter Jones, placenta previa was an indication for caesarean section in 8% of the cases at the Charlotte Memorial Hospital. Posner quotes a figure of 14.91% for antepartum haemorrhage. Lamkee quotes that haemorrhage accounted for 11.9% of sections at the Maynard Hospital (1950-1956) and for 10.9% of caesarean sections at the King County Hospital (1950-1956). Posner gives an average of 9.7% of caesarean sections from a review of the works of other authors.

As the practice of employment of Macafee's expectant line of treatment for placenta previa becomes more and more generally adopted, so also the incidence of caesarean section for this indication rises. Moreover today many more caesarean sections are being undertaken solely in the interests of the foetus.

The rise in incidence of caesarean sections for placenta previa is obvious from the fact that whereas only 11.3% of all cases of placenta previa were subjected to caesarean section in the five-year period 1946 to 1950 at the Nowrosjee Wadia Maternity Hospital, the corresponding figure for the five-year period 1956 to 1960 had risen to 29.6%.

A study of caesarean sections for placenta previa reveals that in the last seven years (1954-1960), the placenta was of grade III and grade IV type in 45% of the cases so treated, and in 28.2% of the cases the placenta was situated posteriorly causing delayed engagement of the head and foetal distress, with a positive Stallworthy's sign.

Of the total number of 141 cases operated on for ante-partum haemorrhage, in 132 cases the placenta was found in the lower uterine segment. In 9 cases, abruptio placentae was the cause of ante-partum haemorrhage, six of these patients were treated conservatively with artificial rupture of membranes, blood transfusions and intravenous pitocin drip in high concentrations of 10 units to 25 units per pint, for periods varying between eight to thirty-one hours. As there was no progress of labour and the vaginal bleeding continued, a caesarean section had become mandatory.

(iii) *Abnormal Presentation*

These accounted for 8.9% of the total number of caesarean sections. In 28.7% of these cases, the abnormal presentation was breech; 68% of these patients were elderly primiparae. In 32% of cases it was frank breech.

In 27.5% of cases the foetal lie was transverse. In 26.4% of cases the presentation was brow. In 10% of cases a caesarean section was undertaken for a face presentation, and in 6.2% of cases, the patient came with a compound presentation.

The number of caesarean sections undertaken for abnormal presentations is on the increase, chiefly because a caesarean section is often preferred to a difficult vaginal delivery or an internal podalic version in cases of shoulder presentation, when the chances of getting a live healthy baby are bright. This fact is clearly brought out by the fact that, whereas 78.6% of all patients of transverse lie were treated with internal podalic version between the years 1946 to 1950, the corresponding figure for the years 1957 to 1961 was 63.8% and the incidence of destructive operations in the hospital had fallen from 0.44% between the years 1946-1950 to 0.21% between the years 1957 to 1961.

(iv) *Cord Presentation and Cord Prolapse*

Just over 5% of caesarean sections were performed for these indications. Of the total number of 72 caesarean sections grouped under this indication, in 46 cases there was a cord prolapse, and in 26 cases there was a cord presentation, 86% of these babies lived and were discharged alive. It is in this particular group of cases, that an early caesarean section can be most rewarding; the foetal prospects are much improved thereby. Whereas in the year 1940-1945 only 0.3% of cases of (4 patients out of a total of 143 cases) cord prolapse were treated by caesarean section, this rate has risen to 22% for the five year period 1956 to 1961.

(v) *Abnormal Uterine Action*

This accounted for 4.05% of caesarean sections. Of the 48 cases operated on for this indication, in 41 cases there was a hypotonic uterine inertia, and in 7 cases the uterus was hyperto-

nic. The number of caesarean sections for this indication are on the decline, as many of these cases are now treated with intravenous oxytocin drip followed by a spontaneous vaginal delivery or an easy forceps termination. We expect that with the increasing popularity of Malmstrom's vacuum extractor, the caesarean section rate for this indication will further decline in years to come.

(vi) *Cervical Dystocia*

This accounted for 4.06% of all caesarean sections. Of the 49 cases operated on for these indications, in 37 cases there was a functional rigidity of the cerviz, 33 of these were primiparae, in whom in spite of maintained good uterine activity the cervix failed to dilate. In 3 patients there was cicatrization of the cervix following a previous Fothergill's repair. In 9 patients a Shirodkar's tightening of the internal os had been undertaken for habitual abortions and incompetent internal os.

(vii) *Miscellaneous*

Thirty-one cases were grouped under this heading; 4 patients had a carcinoma of the cervix, 4 had fibroids of the uterus, 5 patients had been previously successfully operated on for a vesico-vaginal fistula. In 2 patients there was extensive vaginal cicatrization, two patients had vulval growth. Seven patients had previous bad obstetric histories, where no other abnormality was present. In one patient an abdominal cervicopexy had been performed for prolapse of the uterus. In one patient a Graham's operation had been performed for combined uterine and rectal prolapse. One patient had obstetric shock because of intestinal strangulation and 3 patients had bicornuate uteri.

Type of caesarean section

Of the total number of 1237 caesarean sections performed in the eight years, 1954 to 1961, in only 26 cases was a classical casesarean section undertaken, giving an incidence of 2.1%; 21 of these patients were simultaneously sterilized. The chief reasons why a classical approach was undertaken were: (i) difficulty in approaching the lower uterine segment because of adhesions between the bladder and the lower segment, following previous operations in eleven cases, (ii) in four patients there was a marked deformity of the spine, the lower uterine segment was deep down in the pelvic cavity and difficult to approach, (iii) in six patients of placenta previa, the lower segment was very vascular, and there were huge varices in lower segment, (iv) in two patients the foetus was presenting with the spine, the lie was transverse, both cases had come as cases of impacted neglected shoulder presentation with threatened uterine rupture, (v) in 3 patients there existed a previous weak classical scar, the incision was therefore taken at the site of the previous scar.

Anaesthesia

The wide variety of indications for which caesarean sections have been undertaken, often on poor risk cases transferred to the hospital as emergencies, necessitate great judgment regarding the selection of an anaesthetic.

In the present study caesarean sec-

tions have been undertaken under spinal anaesthesia, general anaesthesia, intravenous pentothal anaesthesia and sometimes under local infiltration novacaine anaesthesia alone, as shown in Table IV.

TABLE V

Year	Total No. of cases	Spinal nupercaine		Open ether or intratracheal gas + oxygen + ether		Local novocaine		Local novocaine + I.V. pentothal	
1954-1957	490	209	43%	75	15.3%	102	20.7%	104	21.0%
1958-1961	747	448	60%	106	14.2%	124	16.6%	69	9.2%
Average	1237	657	53.2%	181	14.6%	226	18.2%	173	14.0%

Spinal anaesthesia is the one most frequently employed, and was employed in 53.2% of the total number of cases studied. It was employed in 60% of the cases operated on in 1958 to 1961. It is a very suitable form of anaesthesia for this operation, as it allows excellent relaxation of the abdominal wall musculature, also it does not interfere with uterine contractions, hence the amount of bleeding after extraction of the baby and removal of the placenta is minimal. However, it has to be employed with caution and requires constant expert supervision, or else disasters can occur. The complication of fall of blood pressure following spinal anaesthesia is fairly frequent and can be very severe; with careful supervision it can be detected very early and suitable counter-measures instituted.

Spinal anaestheisa is best avoided in patients who have been in prolonged labour, in dehydrated cases, in toxaemic individuals, in patients in whom the uterus shows manifestations of impending rupture and lastly in all cases with foetal distress.

General anaesthesia was used in 14.6% of cases in the present series. It gives good relaxation, but under its effects the uterus also relaxes and therefore there is always a considerable amount of bleeding at operation. The foetus may show signs of respiratory depression after birth; lastly, as many of these operations are performed as emergencies on patients who have not been suitably prepared for general anaesthesia, vomiting during induction and during recovery are common, often leading to post-operative chest complications.

Local anaesthesia was employed in 32.2% of the cases. In 14% of cases it was supplemented with intravenous pentothal after delivery of the foetus. Local novocaine anaesthesia is employed in patients who are in a poor general state of health, and are unsuitable candidates for other forms of anaesthesia; it is therefore often employed in cases of prolonged labour, severely anaemic patients, toxaemic individuals, in cases of antepartum haemorrhage who have collapsed, and lastly in cases of cord prolapse, where procrastination may jeopardise foetal outcome.

Intravenous pentothal alone is not suitable for caesarean sections, as it

crosses the placental barrier very rapidly and causes respiratory depression in the foetus. However, in cases of cord prolapse, an expert surgeon who is confident of delivering the baby soon, may employ this anaesthesia with advantage. In the present study it was employed in 6 cases only, in all patients the indication for the caesarean section was cord prolapse. In all cases the babies were delivered in less than 4 minutes from the start of the operation, all babies were easily resuscitated at birth and were alive.

Maternal and Foetal Mortality

Of the 1237 patients operated on, 17 patients died post-operatively, giving an incidence of maternal mortality of about 1.4%.

The various causes of death were as under:—

TABLE VI

Cause of death	No. of patients	Remarks
1. Post-operative shock	10	2 Rupture uterus 1 Placenta previa 1 Toxaemic A.P.H. 6 Prolonged labour
2. Pulmonary oedema	1	
3. Septicaemia	2	
4. Peritonitis	1	
5. Pulmonary embolism	1	
6. Genital malignancy	1	
7. Intestinal obstruction	1	

Of the total number of caesarean sections of 1237 cases, 915 caesarean sections were undertaken on booked cases with 6 maternal deaths giving a maternal mortality of 0.65% for booked cases. There were 322 caesarean sections undertaken on emergency cases with a maternal mortality of 3.4%.

The above figures show that our maternal mortality in booked cases is certainly low, although it may not have come down to the low figures achieved in western countries.

The foetal mortality in the present study was 6.4%, it was 2.4% in the booked cases, and about 9% in the emergency cases. As no post-mortem data were available, further details cannot be given.

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