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Original Article

Obstetrics and Gynaecology Section

Outcome of Women Referred with Postcaesarean Complication in a Tertiary Care Centre in North India: A Retrospective Study

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ABSTRACT

Introduction: Rate of Caesarean Sections (CS) has increased over the last few decades. There is an increased referral of women with postcaesarean complications.

Aim: To evaluate the outcome of women with postcaesarean complications.

Materials and Methods: This retrospective study was conducted at the Department of Obstetrics and Gynaecology, King George's Medical University Lucknow, India over six months from August 2018 to January 2019. All the women referred with postcaesarean complications were included in the study. Women who had complications following CS performed at the centre were excluded. Demographic variables like age, socio-economic status, literacy, number of antenatal visits, indication for CS was obtained. The type of complication, number of places visited before admission, the interval between complication and admission, availability of referral documents, interventions required and outcome was noted. Chi-squared tests were used to test for statistical significance. The p-value was considered to be significant if <0.05. Analysis was done using Statistical Package for the Social Sciences (SPSS) software 20.0.

Results: Total women enrolled were 146, with mean age of women was 27.69±4.7 years. The youngest woman was 19 years, while the oldest was 36 years. Total 60.3% (88/146) women were referred from government centres, and the majority of women (82.18%) reached tertiary centres directly and had a referral document. The interval between complication and admission was within 24 hours in only 55 (37.66%) women. The most common reason for referral was septicaemia (39, 26.71%), followed by Postpartum Haemorrhage (PPH) (27, 18.49%). Mortality was seen in 35, 24.6% of women.

Conclusion: Most women referred with postcaesarean complications were from the public health system with appropriate referral procedures. Timely referral after detection of complications will improve maternal outcome.

Keywords: Maternal morbidity, Maternal morbidity, Referral, Septicemia

INTRODUCTION

The maternal mortality rate is a significant health indicator of any country. In India, the maternal mortality rate has reduced from 556 per 100000 live births in 1990 to 122 maternal deaths per 100000 live births in 2015 (SRS 2015-17) [1]. It was achieved due to several initiatives by the Government of India, which included capacity building of health personnel in obstetrics training, primarily on practical skills in the management of labour and delivery, including the Caesarean Sections (CS). The institutional delivery data both in public and private setup showed that the rate of CS increased from 7.2% in National Family Health Survey (NFHS)-1 (1992-1993) to 11.9% in NFHS-4 (2015-2016). The same study also showed that caesarean rate increased three times from 12.3-40.9% during the same period in private health facilities [2]. The increased rate of CS improves the maternal and perinatal outcome to some extent but is associated with excessive cost and complications. There is a dearth of critical care establishments at peripheral health centres to manage the complications and hence the women who develop complications following CS are referred to higher centres [3].

The outcome of women operated at peripheral centres requiring advanced care largely depends on the strength of the referral system. The referral system in this context includes identification of complicated cases, readiness to refer to higher centres and securing referral linkages to ensure timely access to healthcare facilities. Delays in receiving optimal treatment have been directly related to preventable maternal death [4,5]. In the past couple of years, with the increase in many caesareans performed at District Hospitals (DH), Community Health Centres (CHC) and private sectors, there has been an increase in several women who need advanced postoperative care and are referred to higher centres. Though there have been studies in the past to understand the postnatal complications and referral in case of obstetric emergencies, there has been no study to determine the reasons for referral following caesarean done at periphery and their subsequent outcome.

This study aimed to evaluate the outcome of women with postcaesarean complications referred to the tertiary care centre in North India.

MATERIALS AND METHODS

This retrospective study was conducted in the Department of Obstetrics and Gynaecology, King George's Medical University Lucknow, Uttar Pradesh, India in north India over six months from August 2018 to January 2019. Ethical approval was obtained from the Institutional Ethical Committee (97th ECM II B- Thesis/P154 dated-29-07-2019).

Inclusion and Exclusion criteria: All women who had undergone CS at peripheral centres like CHC, DH, and private hospitals and were referred because of postoperative complications were included in the study. The women who developed complications following caesaran section, performed at the study centre were excluded. These women were excluded as the objective was to study the outcome of women referred with complications following CS done at periphery including the referral details.

Procedure

A note was made of demographic variables like age, socio-economic status, antenatal care received and indications for CS. Referral details were also recorded, including the type of referral centre, the number of hospitals visited before admission, the interval between detection of complications and admission, and the availability of referral documents. The women were further studied in terms of associated complications, interventions required and indications for referral. The various complications observed were Postpartum Hemorrhage (PPH) [6], anaemia [7], septicaemia/sepsis [8] as per standard definitions. Surgical complications, including the presence of haemoperitoneum/haematomas/injury to the urinary tract, was also noted. Hypertensive complications were noted as per the American College of Obstetricians and Gynaecologist (ACOG)-2019 and Acute kidney injury as per Kidney Disease Improving Global Outcomes (KDIGO) 2012 [9].

Other complications studied were Disseminated Intravascular Coagulation (DIC) (The International Society on Thrombosis and Haemostasis diagnostic scoring system for overt DIC) and acute liver failure as per the American Association for the study of Liver Disease 2011 [10].

The records were also reviewed for the outcome, evaluated in terms of women discharged in satisfactory condition by the hospital, those discharged on request, women who Left Against Medical Advice (LAMA), Maternal Near-Miss (MNM) and mortality. The neonatal outcome included neonatal deaths or stillbirth. An MNM was defined as "a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy" [11,12] (The Operational Guidelines December 2014 issued by Maternal Health Division of Ministry of Health and Family Welfare Government of India).

STATISTICAL ANALYSIS

Data were collected and entered in Microsoft Excel. For descriptive analysis; percentage, proportion, ratio, mean, median, standard deviation and interquartile range was calculated. Data was presented as the mean±standard deviation. Chi-square test was used to test for statistical significance. The p-value <0.05 was considered to be significant. Analysis was done using Statistical Package for the Social Sciences (SPSS) software version 20.0.

RESULTS

The total number of women referred with postcaesarean complications were 146. The mean age of women was 27.69±4.7 years. The youngest woman was 19 years, while the oldest was 36 years. Majority of women (61.6%) belonged to lower socio-economic class. Caesarean was done at the periphery for various indications, including labour dystocia in 26% women, previous CS in 13.7% women, malpresentation in 12.3% women, acute foetal distress in 11% women [Table/Fig-1].

Demographic details	Number of cases	Percentage (%)
Socio-economic status		
Upper socio-economic class	10	6.8%
Middle socio-economic class	46	31.5%
Lower socio-economic class	90	61.6%
Literacy status		
Iliteracy	55	37.7%
Primary or middle level	38	26.0%
Senior secondary level	43	29.5%
Graduate and above	10	6.8%
Antenatal visits		
≥4 visits	114	78.1%
<4 visits	14	9.6%
No visits	18	12.3%
Indication of lower segment caesarean section		
Labour dystocia	38	26%
Previous caesarean section	20	13.7%
Malpresentation	18	12.3%
Acute foetal distress	16	11.0%
Anhydramnios	12	8.2%
Cephalopelvic disproportion	10	6.9%
Placenta previa	8	5.5%
Cord around neck	8	5.5%
Uncontrolled hypertension	5	3.4%
Others	11	7.5%

[Table/Fig-1]: Demographic details of women enrolled.
Others include Cesarean on matenal request, Multiple pregnancy

Variables	Number of women	Percentage of women	95% CI of observed proportion
Referral center (place of caesarean)			
Private hospitals	55	37.67%	29.79%-46.06%
CHC	20	13.69%	8.57%-20.35%
DH	68	46.57%	38.28%-55.00%
Tertiary care center (other than study center)	3	2.05%	0.42%-5.88%
No. of hospitals visited before admission			
Referred directly	120	82.19%	75.0%-88.02%
One center	15	10.27%	5.06%-16.37%
Two or more centers	11	7.53%	3.83%-13.08%
Referral document	119	81.51%	
No document	27	18.49%	
Null hypothesis=50%			
Interval between identification of complication and admission			
≤24 hrs	55	37.66%	29.78%-46.05%
>24 hrs	91	62.34%	53.95%-70.22%

[Table/Fig-2]: Referrals details of women with postcaesarean complications (n=146).
Null hypothesis=35% (≤24 hours); p-value <0.5004; DH: District hospital, CHC: Community health centres

It was seen that 60.3% (88/146) of women were referred from CHC or DH and 82.19% (n=120) women came directly from the place of surgery to the tertiary care centre, thus saving valuable time in the process. Around 15 (10.27%) women visited one other centre. One third of the women, 55 (37.66%), were referred to tertiary care within 24 hours of detecting complications [Table/Fig-2].

Septicaemia was the most typical reason for referral, followed by PPH and hypertensive disorder [Table/Fig-3]. The interventions following admission like blood transfusion, need for vasopressors, ventilator, surgical intervention and maternal outcome are detailed in [Table/Fig-4]. Of the 35 women who died, 34 women required vasopressor support, 33 ventilator support, 16 blood transfusion, 5 surgical intervention and dialysis was needed by two women. The cause of mortality were pulmonary oedema (n=11), septicaemic shock (n=10), haemorrhagic shock (n=6), uraemia encephalopathy (n=3), acute respiratory distress syndrome (n=2), hepatic encephalopathy (n=2), and eclamptic encephalopathy (n=1).

Assessment of neonatal outcome of these women showed that 118 (80.82%) babies were alive and healthy, whereas 15 (10.27%) babies were stillborn and the remaining 13 (8.90%) had neonatal death. Since the babies were born outside, only their outcome could be noted. The neonatal complications were thus not recorded.

Indications of referral	Number of women	Percentage (%)	95% CI of observed proportion
Septicaemia including surgical site infection	39	26.71%	22.44%-37.83%
Postpartum haemorrhage	27	18.49%	12.55%-25.75%
Hypertensive complications	23	15.75%	10.25%-22.69%
Anaemia	15	10.27%	5.86%-16.37%
Surgical complications	14	9.58%	5.34%-15.55%
Acute kidney injury	11	7.53%	3.82%-13.08%
Morbidly adherant placenta	7	4.79%	1.95%-9.62%
Acute liver failure	4	2.73%	0.75%-6.85%
Paralytic ileus	3	2.05%	0.42%-5.88%
Disseminated intravascular coagulation	2	1.36%	0.16%-4.85%
Myocardial infarction	1	0.68%	0.02%-3.75%

[Table/Fig-3]: Indications of referral (n=146).
CI: Confidence interval; Null hypothesis=50%

Parameters	Number of women	%
Intervention done		
Blood Transfusion	59	40.4
Vasopressor Support	42	28.7
Ventilator Support	42	28.7
Surgical Intervention	26	17.8
Dialysis	5	3.4
Maternal outcome		
Maternal survival	111	76.0
Discharged in satisfactory condition	92	63.0
Discharged on request	6	4.1
Left against medical advice	13	8.9
Maternal mortality	35	24.0
Maternal near miss	29	19.8

[Table/Fig-4]: Interventions done at tertiary centre and maternal outcome (n=146).

DISCUSSION

This study done over six months at a tertiary care centre in North India evaluated the women referred with postcaesarean complications for continued care and found that the most common reason for referral remained septicaemia, including surgical site infections followed by PPH. The majority of the women reached the tertiary care centre directly without visiting any other hospital, thus preventing an undue delay. The most common intervention was blood transfusion followed by critical care provisions like ventilator support and vasopressors.

Development of any complication postcaesarean is multifactorial. It directly depends on the high risk antenatal complications, quality of antenatal care, availability of expertise (surgery and anaesthesia) at the periphery, blood transfusion facilities and most crucial referral linkages. Referral services are crucial in postoperative women to manage the complications before they become life-threatening. A systematic review of maternal health initiatives in resource limited countries in 2011 indicated that the most successful programs to improve maternal health included establishing referral systems as a component [13].

Raj SS et al., conducted a study on emergency referral transport for maternal complications in Unnao district, Uttar Pradesh, in 2009-2010 [14]. They found that amongst 57 maternal deaths, 25% of the women went to one facility, 32% to two facilities, and 25% to three facilities, while 19% did not visit any facility before their death. Arpana A et al., evaluated maternal outcomes among emergency obstetric admissions at a tertiary care teaching hospital in Chitradurga, South India in 2016-2017 [15]. In the majority of the emergency admissions, there was a delay in reaching the hospital by 2-4 hours (44% cases), 5-10 hours (32%) and also 10-12 hours duration (13%). The reasons for a delay in reaching the optimal healthcare centre can range anywhere from difficult transport, lack of communications, inaccessible location of health facilities, poor decision-making of healthcare professionals, and the unwillingness of the woman and her relatives for a referral.

This study showed that 80% of the referrals had documentation accompanying the women from the referral centre reiterating the robust referral linkages in the area. This is in contrast to study by Gupta M et al., on referral systems for emergency obstetrics care in Gujarat in 2009. The authors found that no records relating to referrals between institutions are usually kept. No referral documents or communication about the referred case is provided to the next level institution. Further, it stressed a need for a more robust routine feedback mechanism or routine monitoring of the appropriateness of referrals in India [16]. Patel HC et al., in a survey of obstetrics referrals in Gujarat, found the most frequent reason for postnatal referral was postpartum haemorrhage (83.3%) [17]. As it is evident by the data, the referral system in the country, including free and rapid transport availability and provision of a referral document, has improved remarkably.

There is a lack of data catering specifically to postoperative referral cases. However, in a five-year survey of CS in Nigerian tertiary hospitals 2008-2009 by Ugwu EO et al., anaemia was the most typical postoperative complication, occurring in 32.5% of women, followed by pyrexia 24% and wound infection 9% [18]. In the study by Rajbhandary S and Shrivastava VR, the most common complications encountered were urinary tract infection (34/183 women; 18.6%) followed by wound infection (12/183; 6.6%) [19]. Postpartum haemorrhage was seen in 3 (1.6%) women and caesarean hysterectomy in one woman (0.5%).

This study highlights that there is still a high number of women who died due to postcaesarean complications. These women were primarily referred with septicaemia and hypertensive complications, requiring immediate critical care support. In evaluating obstetric near miss and maternal deaths in the study by Pandey A et al., which included 6357 deliveries [20]. Haemorrhage and hypertensive disorders of pregnancy were the leading causes of maternal deaths (28.7 and 21.5%, respectively).

To the best of author's knowledge, no other study focused on postoperative women and referral services has been published so far. This study developed insight into the evolving emergency obstetric care at peripheral centres in Uttar Pradesh. Simultaneously the tight referral linkages and their contribution in reducing adverse maternal outcomes were also evident. However, there is a need for further improvement of referral services with caesarean complications.

Limitation(s)

The main limitation of this study was the small sample size and retrospective nature of the study and hence the causes of delayed referral are poorly understood. The strengthened referral services have contributed immensely to decreasing the maternal morbidity and mortality associated with these postcaesarean complications. Comprehensive upgradation of emergency referral systems is mainly responsible for the improving statistics of maternal health.

CONCLUSION(S)

The tertiary centre receives 20-30 referrals of women with postcaesarean complications from both government/private hospitals every month. It was seen in the study that majority of women were referred with appropriate documents. The study also showed that only one-third women reached the tertiary centre within 24 hours of identification of complication. The referrals were primarily due to need for blood transfusion and critical care support. Developing a standard referral protocol, its compliance, vigilant monitoring, and regular evaluation of policy outcomes is indispensable in ensuring

effective referral interventions. A more extensive study involving CS done at centres other than tertiary care, including referrals of these women and follow-up is required to explore the situation further, identify gaps and suggest appropriate interventions to improve maternal health.

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