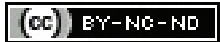


Maternal and Perinatal Outcomes in Placenta Previa: A Retrospective Study at a Tertiary Care Centre of Western India

SHITAL UMESH LAD¹, MANGALA ASHOK SHINDE²

ABSTRACT

Introduction: Placenta previa is a condition characterised by abnormal placental implantation and usually presented as painless vaginal bleeding in second or third trimester of pregnancy. Various studies have reported adverse outcomes in the cases of placenta previa.

Aim: To find incidence, maternal and perinatal outcomes in placenta previa.

Materials and Methods: This retrospective study was carried out during April 2021 to June 2021 at a Government tertiary care centre in Maharashtra. Total 260 cases of placenta previa managed at the institute between 1st January 2017 to 31st December 2019 were included in study. Primary data from labour room and operation theatre was collected and detailed case papers were accessed from medical records section. Data was analysed using Microsoft Excel Windows 2013.

Results: Incidence of placenta previa was 1.09%. Majority of cases were from age group of 26-30 years, booked, gravida 2-3, belonging to low socio-economic status and without any history of risk factors. In 81.15%, cases Lower Segment Cesarean Section (LSCS) was required. Post Partem Haemorrhage (PPH) (32.30%) and need for blood transfusion (86.15%) were major complications. Maternal mortality in cases of placenta previa was 4.23%. In perinatal outcome, prematurity was reported in 44.30% cases while 57.46% needed Neonatal Intensive Care Unit (NICU) admission. Perinatal mortality was 17.53%.

Conclusion: There is need for regular Antenatal Care (ANC) check-up and timely referral to tertiary care obstetrical care centre with availability of Blood bank and NICU for better outcome.

Keywords: Antepartum haemorrhage, Maternal outcome, Minor placenta previa, Placenta previa, Postpartum haemorrhage

INTRODUCTION

Antepartum haemorrhage is one of the most dangerous and devastating groups of disorders in obstetrics. Placenta previa contributes to 1/3rd cases of antepartum haemorrhage [1]. Placenta previa is an obstetric condition characterised by abnormal implantation of placenta into the lower segment of the uterine wall, covering whole or part of the cervix [2]. It is a major risk factor for postpartum haemorrhage and can lead to morbidity and mortality of the mother and neonate [3]. Placenta previa is classified in four types on the basis degree of extension of placenta to the lower segment. Type-I (low lying) major part of placenta is attached to the upper segment and only the lower margin encroaches on the lower segment but not up to the internal os. Type-II (marginal) placenta reaches the margin of internal os but does not cover it. Type-III (incomplete or partial central) the placenta covers internal os partially (covers internal os when closed but does not entirely cover when fully dilated). Type-IV (Central or Total) placenta completely covers the internal os even after it is fully dilated. Placenta lies in the anterior or posterior uterine wall, the posterior is more common. Clinically Type-I, Type-II anterior are called Minor degree placenta previa and Type-II posterior, Type-III and Type-IV are called Major degree placenta previa [4].

Painless vaginal bleeding during the second or third trimester of pregnancy is the usual appearance. Bleeding may be initiated from intercourse, vaginal examinations, labour, and at times there may be no recognizable cause [5-8]. Major risk factors that are associated with placenta previa includes old maternal age and high parity, multifetal gestation, uterine surgery (curettage), smoking and cocaine use, and abortion[3]. Increasing rates of caesarean section which is one of the most important risk factor, the future generation of obstetricians have to be skilled in managing the dire problems of placenta previa and the morbidly adherent placenta scenarios. It has been documented in the national family health survey 2019-20

report that in Maharashtra; a western state of India, there is 10% increment in the deliveries conducted by caesarean section and there is rising trend of institutional deliveries compared to the National Family health survey 2015-16 [9].

Reported incidence of placenta previa in India ranges from 0.3 to 1.8% [2]. In India, there is a wide variation in availability of quality obstetrics care for pregnant mothers, urban population has an easy access to tertiary care hospital whereas patients from rural areas are referred in late stage. Early diagnosis of placenta previa is almost always done using ultrasound examination, a routine third trimester ultrasonography if done as per schedule, there are fare chances of diagnosis of the placenta previa in time and patients can be advised to report to tertiary care centre [5].

The main objective of this study was to retrospectively access prevalence, associated risk factors, socio-demographic data, maternal and perinatal outcome in the cases of placenta previa admitted in the institute during three years of study period.

MATERIALS AND METHODS

This retrospective study was carried out during April 2021-June 2021 at Government tertiary care centre in Maharashtra, India after ethical clearance from Institutional Ethical Committee (SUL/IEC/VDGMCL/18/2021). A Government institute is a referral centre for patients from urban as well as rural setups of periphery. In this study, incidence, maternal and perinatal outcome in cases of placenta previa managed in three years duration between 1st January 2017 to 31st December 2019 at the institute was analysed.

Inclusion and Exclusion criteria: All diagnosed cases of placenta previa managed at the institute during 1st January 2017 to 31st December 2019 were included in the study. Other cases without placenta previa were excluded.

Study Procedure

Primary data was collected from labour room, delivery register, theatre records and maternity ward admission register. Total 23,645 deliveries were conducted during 1st January, 2017 to 31st December, 2019. After scrutinising primary data, total 260 cases of placenta previa were found and their case papers were obtained from medical records section for analysis.

Patient's socio-economic status was analysed using Modified Kuppuswami scale and classified in low, middle and upper socio-economic status [10]. Parity, clinical presentation, risk factors for placenta previa, mode of delivery, gestational age at delivery, complications, perinatal and maternal outcome, was evaluated.

Placenta previa was classified in four types according to ultrasound findings as per predefined criteria. For clinical and data analysis purpose, Type-I and Type-II anterior were grouped as minor placenta previa and Type-II posterior, Type-III and Type-VI were grouped as major placenta previa [4].

STATISTICAL ANALYSIS

Data was tabulated and analysed using Microsoft Excel Windows 2013 and presented as frequency and percentages of total cases.

RESULTS

Total number of deliveries conducted in the study period were 23,645, of these 260 (1.09%) cases of placenta previa were diagnosed and treated at our tertiary care facility. Majority of cases of placenta previa were in the age group of 26-30 years, low socio-economic status, gravida 2-3 and booked and gestational age ≥ 37 weeks of gestation [Table/Fig-1].

Variables	Frequency (n)	Percentage (%)
Age (years)		
Less than 20	0	0
20-25	89	34.23
26-30	112	43.07
31-35	45	17.30
>35	14	5.38
Socio-economic status		
Low	172	66.15
Middle	68	26.15
Upper	20	7.69
Gravida		
1	24	9.23
2-3	189	72.69
≥ 4	47	18.07
Booking status		
Booked	148	56.92
Unbooked	112	43.07
Gestational age (in weeks)		
28-32	35	13.46
33-36	84	32.30
≥ 37	141	54.23

[Table/Fig-1]: Socio-demographic data (N=260).

On assessment of risk factors of placenta previa, it was observed that in our study population there were 63.46% patients presented without any known risk factors. Previous LSCS was the major known risk factor in 20.76% patients [Table/Fig-2].

Obstetric ultrasound examination revealed that there were 39.23% patients with minor placenta previa and 60.76% patients had major placenta previa [Table/Fig-3].

In the present study population, only 18.84% patient were delivered vaginally whereas 81.15% patients required LSCS. Out of 211 cases

H/O Risk factors	Frequency (n)	Percentage (%)
Previous LSCS	54	20.76
Previous abortions	33	12.69
Spontaneous abortions	21	8.07
Dilation and curettage	12	4.61
Multiple gestation (twins)	08	03.07
Malpresentations in present pregnancy	42	16.15
No risk factor found	165	63.46

[Table/Fig-2]: Risk factors in placenta previa (N=260).

There were few patients with multiple risk factors, so frequency is higher than the total number of patients

LSCS: Lower segment cesarean section

Placental position	Frequency (n)	Percentage (%)
Minor placenta previa	102	39.23
Type I	54	20.76
Type II anterior	48	18.46
Major placenta previa	158	60.76
Type II posterior	31	11.92
Type III	88	33.84
Type IV	39	15

[Table/Fig-3]: Placental position in cases of placenta previa (N=260).

which required LSCS, 72.98% cases underwent emergency LSCS, this comes to 59.23% of total cases of placenta previa (n=260) [Table/Fig-4].

Mode of delivery	Frequency (n)	Percentage (%)
Vaginal delivery	49	18.84
Spontaneous	46	17.69
Ventouse	3	1.1
Low forceps	0	0
LSCS	211	81.15
Elective	57	27.02
Emergency	154	72.98

[Table/Fig-4]: Mode of delivery in cases of placenta previa (N=260).

A 21.92% cases were managed expectantly till 37 weeks. These cases were preterm and haemodynamically stable with no active bleeding per vaginally to improve the fetal survival. Active management was done in 78.07% of cases [Table/Fig-5].

Management	Frequency (n)	Percentage (%)
Active	203	78.07
Expectant	57	21.92

[Table/Fig-5]: Management protocol in placenta previa (N=260).

Severe anaemia was a major complication in the cases of minor (37.25%) and major (68.35%) cases of placenta previa. Blood transfusion was given in 71.56% cases of minor and 95.56% cases of major placenta previa. A 13.29% of cases of major placenta previa underwent emergency hysterectomy while none of the cases of minor placenta previa required hysterectomy. Maternal mortality and ICU admission was required in only cases of major placenta previa while minor placenta previa recovered without any need of ICU admission [Table/Fig-6].

Furthermore, prematurity was reported in 44.4% cases and in about 57.46% cases, there was requirement of the NICU admission. Total perinatal mortality reported during study period was 17.53% [Table/Fig-7].

DISCUSSION

In present study, the prevalence of placenta previa was 1.09%, there were total 23,645 deliveries were conducted at the institute

Maternal outcome	Minor placenta previa (n=102)		Major placenta previa (n=158)		Total cases of placenta previa (n=260)	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Complications						
Severe anaemia Hb <7 gm%	38	37.25	108	68.35	146	56.15
Haemorrhagic shock	00	00	12	7.59	12	4.61
Need of blood transfusion	73	71.56	151	95.56	224	86.15
Postpartum haemorrhage (PPH)	28	27.45	56	35.44	84	32.30
Need of emergency hysterectomy	0	0	21	13.29	21	8.07
Febrile morbidity	6	5.88	23	14.55	29	11.15
Sepsis	3	2.94	9	5.69	12	4,61
ICU admission	0	0	27	17.08	27	10.38
Maternal death	0	0	11	6.96	11	4.23

[Table/Fig-6]: Maternal outcome in placenta previa (N=260).

Outcome	Grams	Minor placenta previa (n=107) (Include 5 twin gestations)		Major placenta previa (n=161) (Include 3 twin gestations)		Total (n=268) (Include 8 twin gestations)	
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Birth weight	1000-1499	3	2.91	27	16.77	30	11.19
	1500-1999	11	10.28	53	32.91	64	23.88
	2000-2499	35	32.71	47	29.19	82	30.59
	≥2500	58	54.20	34	21.11	92	34.32
Prematurity (<37 wks)		36	33.64	83	51.55	119	44.40
NICU admission		56	52.33	98	60.86	154	57.46
Live births		98	91.58	144	89.44	242	90.29
Still births		9	8.41	17	10.55	26	9.70
Early neonatal deaths		5	4.67	16	9.93	21	7.83
Total perinatal deaths		14	13.08	33	20.49	47	17.53

[Table/Fig-7]: Perinatal outcome (N=260).

and there were 260 cases of various grades of placenta previa. Incidence in present study is concurrent with the incidence reported by various studies in India and abroad [2]. A retrospective study conducted by Zhang L et al., reported incidence of 4.9%, similarly a meta-analysis conducted by Cresswell JA et al., reported incidence of 5.2 cases per 1000 pregnancies which comes to 0.52 % across the world [11,12]. In their study, highest incidence of placenta previa was in the Asian population (1.2 %) and lowest in African population (0.27%). Furthermore, the review article highlighted heterogeneity in reported incidence of placenta previa in various geographical regions. They suggested there can be ethnic and some unknown causes responsible for the heterogeneity in the reported incidence. The scarcity of data from low and middle income countries was also emphasised by Cresswell JA et al., [12]. The variation in reported rate of incidence might be due to the geographical location and type of institute treating patients of placenta previa. The study centre is a tertiary care teaching hospital and a District referral centre. This might be the reason for the higher incidence rate.

The incidence of placenta previa was highest in the multiparous women, 56.92% cases from the present study were booked cases and 54.23% cases presented beyond 37th week of gestation. These findings are almost similar to study conducted by Rangaswamy M et al., [13] and similar trends were recorded by Zhang L et al.,[11].

In the present study, majority of cases were without any attributable risk factor or history from previous pregnancy whereas in 20.76% cases, there was history of previous LSCS. Similar findings were reported by various Indian studies [13-16].

A strong association between history of a previous caesarean section, spontaneous or induced abortion, and the subsequent development of placenta previa is reported by Ananth CV et al., [17]. Furthermore, they stated that, the risk increases with number of prior caesarean deliveries. Pregnant women with a history of caesarean section or abortion must be regarded as high risk for placenta previa and must be monitored carefully. In present study, we analysed

data of three years to see the association between abortions and placenta previa, we found that 12.69% of cases admitted at our institute had history of previous abortion, amongst them 8.07% had a spontaneous abortion and 4.61% underwent dilatation and curettage. History of malpresentation in present pregnancy was another major association with placenta previa. In the present study, there were 16.15% patients presented with malpresentation. This is an independent risk factor for placenta previa; our findings are in concurrence with Kumari Set al.,[15].

In the present study, there were 60.76% cases of major placenta previa, amongst them 33.84% were of Type III, these findings are different than the findings reported by Sarojini et al., Kumari S and Singh B where they reported maximum number of cases in the with Type VI placenta previa [14, 15].

In the present study, about 81.15% of total cases were delivered by LSCS, out of 211 cases delivered with LSCS, 72.98% were emergency and remaining 27.02% were elective. Study conducted by Sarojini et al., reported an incidence of LSCS is 86.8%. Another study conducted by Shakuntala PN et al., reported that LSCS was required in 64% cases in their study [14,18]. In the present study, we found that active management was required in 78.07% cases and 21.92% cases were managed expectantly. Similar finding was reported by other studies [14-16,18]. These differences might be due to the location of study centre and disparity in availability of quality obstetrics care.

Rate of complications was higher in the cases of major placenta previa. It was seen that 8.07% cases underwent emergency hysterectomy and all of them were suffering from major placenta previa, similarly 10.38% cases required ICU admission for various medical reasons and maternal mortality was 4.23%; all these cases were diagnosed as major placenta previa and none of the cases with minor placenta previa showed such complications. The results of the present study are in coherence with the results of other Indian studies [14-16,18,19].

In the present study, majority of the study population babies (34.32%) were weighing more than 2500 grams. But, when the data of major and minor placenta previa were analysed separately, authors found that in the major placenta previa 32.91% cases were weighing between 1500 to 1999 grams. Similar trend was observed in the comparison of prematurity, need for NICU admissions, still births, early neonatal deaths and in the total perinatal deaths. It suggests that the risk of perinatal adverse outcome is high in the cases of Major placenta previa than in the minor placenta previa. These findings are similar with other studies [14-16,18,19].

Limitation(s)

The present study was a single centre study in a region of Maharashtra, a state in western India. As it is a tertiary care referral centre, the incidence is from the referred case admitted at our hospital, a study with analysis of all deliveries from the geographical area would give the real incidence.

CONCLUSION(S)

The present study highlights the higher association of placenta previa in the cases with history of previous caesarean section and previous abortions. Multiple gestation and malpresentation in present pregnancy were also associated with placenta previa. There is higher risk and adverse maternal and foetal outcome comparatively in the cases with major placenta previa than in the cases of minor placenta previa. There is need for timely referral of placenta previa case to a tertiary care obstetrics centre with availability of blood bank and NICU. This might improve the maternal and perinatal outcomes.

REFERENCES

- [1] Donald I. Textbook of practical obstetric problems. 5th edition. Edward Arnold Publishers Limited; 2007:423-54.
- [2] Khirasaria DM, Nayak TC. A study of complications in cases of placenta previa. *Int J Reprod Contracept Obstet Gynecol.* 2017;6:5503-07.

- [3] Feng Y, Li XY, Xiao J, Li W, Liu J, Zeng X, et al. Risk factors and pregnancy outcomes versus incomplete placenta previa in Mid- pregnancy. *Curr Med Sci.* 2018;38(4):567-601.
- [4] Konnar H editor. DC Dutta's Textbook of Obstetrics. 8th ed. New Delhi: Jaypee Brothers Medical Publishers; 2015. Pp. 283-84.
- [5] Oyelese Y. Placenta previa: The evolving role of ultrasound. *Ultrasound Obstet Gynecol.* 2009;34:123-26.
- [6] Oyelese Y, Smulian JC. Placenta previa, placenta accreta, and vasa previa. *Obstet Gynecol.* 2006;107(4):927-41.
- [7] Kumari S, Singh B. Maternal and perinatal outcome of placenta previa in a tertiary care centre: An observational study. *Int J Reprod Contracept Obstet Gynecol.* 2018;7:4701-05.
- [8] Anderson-Bagga FM, Sze A. Placenta Previa. [Updated 2020 Jun 27]. In: Stat Pearls [Internet]. Treasure Island (FL): Stat Pearls Publishing; 2021 Jan. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK539818/>.
- [9] rchiips.org/nfhs/NFHS-5_FCTS/FactSheet_MH.pdf (accessed on 30 Nov 2021).
- [10] Shaikh Z, Pathak R. Revised Kuppuswamy and B G Prasad socio-economic scales for 2016. *Int J Community Med Public Health.* 2017;4:997-99.
- [11] Zhang L, Bi S, Du L, Gong J, Chen J, Sun W, et al. Effect of previous placenta previa on outcome of next pregnancy: A 10-year retrospective cohort study. *BMC Pregnancy Childbirth.* 2020;20:212. <https://doi.org/10.1186/s12884-020-02890-3>.
- [12] Cresswell JA, Ronsmans C, Calvert C, Filippi V. Prevalence of placenta praevia by world region: A systematic review and meta-analysis. *Trop Med Int Health.* 2013;18:712-24. <https://doi.org/10.1111/tmi.12100>.
- [13] Rangaswamy M, Govindaraju K. Fetomaternal outcome in placenta previa- a retrospective study in teaching hospital. *Int J Reprod Contracept Obstet Gynecol.* 2016;5:3081-84.
- [14] Sarojini, Malini KV, Radhika. Clinical study of placenta previa and its effect on maternal health and fetal outcome. *Int J Reprod Contracept Obstet Gynecol.* 2016;5:3496-99.
- [15] Kumari S, Singh B. Maternal and perinatal outcome of placenta previa in a tertiary care centre: An observational study. *Int J Reprod Contracept Obstet Gynecol.* 2018;7:4701-05.
- [16] Sarella L, Chinta A. A study on maternal and perinatal outcome in placenta previa. *Sch J App Med Sci.* 2014;2(5):1555-58.
- [17] Ananth CV, Smulian JC, Vintzileos AM. The association of placenta previa with history of cesarean delivery and abortion: A metaanalysis. *Am J Obstet Gynecol.* 1997;177(5):1071-78. Doi: 10.1016/s0002-9378(97)70017-6. PMID: 9396896.
- [18] Shakuntala PN, Chandana HS, Nagesh Gowda BL, Kumar A, Ramaiah R. Maternal and fetal outcomes in pregnant women with major degree placenta previa at ESIC MC and PGIMS. *Gal Int J Health Sci Res.* 2020;5(4):42-52.
- [19] Salim NA, Satti I. Risk factors of placenta previa with maternal and neonatal outcome at Dongola/Sudan. *J Family Med Prim Care.* 2021;10:1215-17.

PARTICULARS OF CONTRIBUTORS:

1. Assistant Professor, Department of Obstetrics and Gynaecology, Vilasrao Deshmukh Government Medical College, Latur, Maharashtra, India.
2. Professor, Department of Obstetrics and Gynaecology, Vilasrao Deshmukh Government Medical College, Latur, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Shital Umesh Lad,
104, Om Heritage Apartment, Behind Hotel Parth, Aambejogai Orad,
Latur, Maharashtra, India.
E-mail: shitalshisode@gmail.com

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? NA
- For any images presented appropriate consent has been obtained from the subjects. NA

PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Oct 04, 2021
- Manual Googling: Oct 08, 2021
- iThenticate Software: Dec 31, 2021 (10%)

ETYMOLOGY: Author Origin

Date of Submission: Oct 02, 2021
Date of Peer Review: Oct 26, 2021
Date of Acceptance: Jan 01, 2022
Date of Publishing: Feb 01, 2022