

DOI: 10.5455/2320-1770.ijrcog20140937

Research Article

## Placental abruption: a persisting killer

Shakuntala Amirchand Chhabra\*, V. Pandit, M. Gosavi

Department of Obstetrics & Gynaecology, Mahatma Gandhi Institute of Medical Sciences, Sevagram, Wardha-442102, Maharashtra, India

**Received:** 26 June 2014

**Accepted:** 5 July 2014

**\*Correspondence:**

Dr. Shakuntala Amirchand Chhabra,

E-mail: chhabra\_s@rediffmail.com

© 2014 Chhabra SA et al. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ABSTRACT

**Background:** Placental abruption, common disorder in obstetric practice, enigma too, is uniquely fraught with dangers to mother baby. Objectives of study were to study trends of placental abruption, risk factors, management strategies to learn more for reduction in morbidity-mortality of mother-baby, even with low resources, also get insight for future research.

**Methods:** Records of cases of placental abruption managed over 27 years (between 1985 to 2011) were divided into three yearly blocks, A to I and analysed. Details including operative procedures like dilatation-curettage, Caesarean Section (CS) or Ante-Partum Haemorrhage (APH) in past, disorders like chronic hypertension, threatened abortion, pregnancy specific hypertension, diabetes, anaemia in index pregnancy, management done maternal-neonatal outcome were analysed using stata 6 software.

**Results:** There were 66,459 births during analysis period with 667 cases of placental abruption, 1% births, increasing trends from, 0.73% between 1985-1987 to, 1.11% in 2009-2011. In these 667 cases of placental abruption, 211 (32.5%) perinatal deaths occurred. Ratio of perinatal deaths due to placental abruption to overall perinatal deaths increased from 2.12% (8 cases) between 1985-1987 (Block A) to 5.12% (37 cases) between 2009-2011 (Block I). Case fatality in cases of placental abruption has been fluctuating between 3 to 5% till 2004, contributing to around 12-15%, maternal mortality, with no fatality in last 7 years.

**Conclusions:** Cases of placental abruption have been increasing with no obvious reason. In recent past maternal deaths could be prevented but perinatal deaths, have been persisting actually more in last decade.

**Keywords:** Placental Abruption, Perinatal deaths, Maternal deaths

### INTRODUCTION

Placental abruption, continues to be a common disorder in obstetric practice and an enigma too. Despite, the advances in obstetrics, there are no reliable tests or biomarkers to predict and prevent the occurrence of placental abruption which could still be a nightmare for the treating team. It is uniquely fraught with dangers to the mother as well as the baby.

It is reported to occur in 0.49 to 1.8% births<sup>1-4</sup> and accounts for 12 to 15% of stillbirths<sup>5-7</sup> and 3% of Neo-

Natal Deaths (NND).<sup>8-10</sup> Maternal Mortality Ratio (MMR) due to placental abruption was reported to be seven times higher than the general MMR of 5.7 in a study even from a developed country.<sup>11</sup> Evidence from the United States and Norway indicates that the frequency is increasing.<sup>3,12</sup>

The frequency varies by gestational age at delivery, tenfold higher with very preterm gestations, sharply declining as pregnancy progresses towards term, 5.4% and 0.3% at preterm and term gestations respectively.<sup>3,13,14</sup>

Despite extensive research, the majority of cases of placental abruption continue to be of unknown cause. However it is known to be more commonly associated with previous placental abruption, uterine tumours, dietary deficiencies, especially folate, hypertensive disorders, polyhydramnios, oligoamnios, prolonged rupture of membranes, chorioamnionitis, short umbilical cord and sudden uterine decompression.<sup>15,16</sup> Epidemiologic studies have revealed, that advanced maternal age, cigarette smoking, cocaine, grand multiparity, previous spontaneous abortions, gestation with male fetus, gestation occurring in high altitude, and twinning are associated with placental abruption.<sup>17,19</sup>

The objectives of the present study were to study the cases of placental abruption so as to know the trends, associated factors maternal perinatal outcome so as to try decrease in morbidity and mortality in the mother as well as the baby even with low resources and get some insight into future research needed.

## METHODS

Analysis of records of cases of placental abruption managed over 27 years (between 1985 to 2011) was done. The cases were divided into three yearly blocks, A to I to know the trends. Details of history including

operative procedures in past like dilatation and curettage, Caesarean Section (CS) or Ante-Partum Haemorrhage (APH) in the past and disorders like chronic hypertension, threatened abortion, pregnancy specific hypertension, diabetes, anaemia in the index pregnancy, management and maternal neonatal outcome were analysed.

Diagnosis was by standard history, clinical examination excluding placental praevia. Not much has changed in management except for easy availability of blood and electronic foetal heart monitoring available.

## RESULTS

During the period of analysis there were 66459 births and 667 cases of placental abruption, giving an incidence of 1% births but with increasing trends, 0.73% in 1985 - 1987, (Block A) 1.08% in 2006 - 2008 and 1.11% in 2009 - 2011 (Block I) (Table 1). Majority of women [390 (58.4%)] were second and third gravida, primigravida were 37.3% (249), significantly less than overall cases, 45% primigravida (P value >0.002) and grand multipara were 28(4.3%). Most of the women, [88.6%(591)] were of 20–29 years. In block A 3.5% (2) and 1.3% (1) in block I, were of teenage. In block A 8.6% (51), and in block I 13.8% (82) women, were of more than 30 years.

**Table 1: Trends in placental abruption.**

Block	Total births	Total perinatal deaths	Perinatal mortality rate	No of cases of placental abruption	Incidence (%)	Perinatal deaths (AP)	PMR in placental abruption	Contribution of placental abruption to PMR
A	3961	377	95.18	29	0.73	8	275.8	2.12
B	4098	387	94.44	35	0.85	12	342.8	3.10
C	4488	472	105.17	40	0.89	17	425.0	3.60
D	6765	598	88.40	59	0.87	20	338.9	3.34
E	8223	592	72.00	78	0.94	27	346.1	4.50
F	8721	580	66.51	89	1.02	32	359.5	5.50
G	8663	596	68.80	100	1.15	24	240.0	4.02
H	10286	680	66.10	112	1.08	34	303.6	5.00
I	11254	722	64.15	125	1.11	37	296.0	5.12
<b>Total</b>	<b>66459</b>	<b>5004</b>	<b>75.29</b>	<b>667</b>	<b>1.00</b>	<b>211</b>	<b>316.3</b>	<b>4.21</b>

PMR - Perinatal mortality per 1000 births (Stillbirths early neonatal deaths)

A - 1985-1987, B - 1988-1990, C - 1991-1993, D - 1994-1996, E - 1997-1999, F - 2000-2002, G - 2003-2005, H - 2006-2008, I - 2009-2011

Sixty-nine (10.3%) women had abortion in the past, 101 (15.1%) had previous CS and 36 (5.3%) women had APH in previous pregnancy. Twenty-nine (4.3%) study subjects had presented with abdominal trauma. Pre-eclampsia was present in 96 (14.3%), 16 (2.3%) had eclampsia, overall 18.57% (124) women were having

hypertensive disorders, higher than 12.5% overall incidence of hypertensive disorders during the study period (highly significant difference (P value <0.0001). Gestational diabetes was present in 3.14% (21 cases), similar to over all cases and anaemia in 51.87% (346) [less than 60% usual anaemic cases in third trimester, but

difference insignificant (P value) 0.54], 3.74% (25 cases) women had twin pregnancy, higher than overall 1% (P value 0.36), hydroamnios 2.99% (20 cases), higher than overall 1.5% (P value 1.0), Foetal Growth Restriction (FGR) was present in 4.19% (28 cases), lower than overall 12% (P value 0.062), 41.07% (274) had preterm gestation, much higher than overall 15% (P value 0.002) preterm births and coagulopathy occurred in 6 (0.9%) cases. Placental abruption was of mixed variety in 271 (40.6%), 213 (32%) had revealed haemorrhage and 183 (27.4%) women had concealed abruption.

Of the 667 women with placental abruption, 373 (55.93%) delivered vaginally and 294 (44.07%) had CS. CS rate increased and spontaneous onset of labour and vaginal births decreased, 42.86% births & 57.14% vaginal births in block A and 48.36% CB & 51.64% VB, in block I but difference insignificant (P value >0.66). CS at admission also increased marginally from 33.33% in block A to 35.59% in block I, insignificant difference (P value 0.75), The CS performed for failure of induction also increased from 15.7% in block A to 18.4% in block I (Table 2).

**Table 2: Gestational age & mode of delivery.**

Block	Number of cases	28-32			33 - <37			≥37								
		Spontaneous		Induced	Spontaneous		Induced	Spontaneous		Induced						
		CS	VB	CS	VB	CS	VB	CS	VB							
A	49	1	-	6	1	1	1	1	4	2	1	5	4	11	6	5
B	48	1	-	7	1	-	1	1	3	2	1	4	5	15	3	4
C	58	1	1	7	2	-	1	1	5	3	1	6	3	16	5	6
D	61	1	1	5	2	1	1	1	3	2	1	6	6	17	7	7
E	61	1	1	6	2	1	1	1	6	3	1	6	5	16	6	5
F	71	2	1	7	2	-	2	2	7	4	1	6	4	18	6	9
G	82	3	1	8	2	1	2	3	7	5	2	8	6	17	8	9
H	115	5	2	10	3	4	3	5	10	6	4	12	8	23	9	11
I	122	5	4	11	4	3	5	5	13	8	4	11	9	19	8	13
<b>Total</b>	<b>667</b>	<b>20</b>	<b>11</b>	<b>67</b>	<b>19</b>	<b>11</b>	<b>17</b>	<b>20</b>	<b>58</b>	<b>35</b>	<b>16</b>	<b>64</b>	<b>50</b>	<b>152</b>	<b>58</b>	<b>69</b>

AA - At admission, L - Later, CS - Caesarean Section, VB - Vaginal Birth

Amongst 667 cases of placental abruption, there were 211 (32.5%) perinatal deaths. The ratio of placental abruption to overall perinatal deaths increased from 2.12% (8 cases) in block A to 5.12% (37 cases) in block I, highest in block F 5.5% (32cases). Of 172 term CB, 17 babies died (9.8%), and of 122 preterm CB, 37 babies died (30%). The perinatal deaths in cases of CS for placental abruption were 18.3% (54) and with VB 44.7% (167), out of 221 term VB, 98 (44.2 %) babies died and of 152 preterm VB 45.5 % (69), however this includes Intra-Uterine Deaths (IUD) at admission, of the total 35 women who had IUD, nine were term and 26 preterm. Of the nine women who had term gestation and IUD, two had spontaneous onset of labour and vaginal births, in five labour was induced, followed by vaginal births, however two had undergone CS (one for failure of induction, and other for deteriorating maternal condition). Of the 26 women who had preterm gestation and IUD, three underwent CS (two for failure of induction, one for excessive bleeding), five had spontaneous onset of labour and delivered vaginally, and in 18 labour was induced and they had VB.

Overall 221 term vaginal births 44.2% (98) babies died and of 152 preterm VB also 45.5% (69) died. Corrected perinatal loss, excluding IUD was 27.86% (34) perinatal deaths of 122 preterm CB & 8.72% (15 PD of 175 CB at term). Perinatal deaths among women who delivered vaginally were 30.26% (46 of 162) amongst preterm & 41.17% (91 of 211) amongst term (Table 3 & Table 4).

**Table 3: Gestational age & mode of delivery.**

Gestation	Mode of delivery	Spontaneous labour		Induced labour		Total	
		VD	CB		VD		CB
			AA	L			
28-32	67	20	11	11	19	128	
32-36	58	17	20	16	35	146	
>37	152	64	50	69	58	393	
<b>Total</b>	<b>277</b>	<b>101</b>	<b>81</b>	<b>96</b>	<b>112</b>	<b>667</b>	

VD - Vaginal Delivery, AA - At Admission,

CS - Caesarean Section, L - Later

**Table 4: Gestation, type of abruption and mode of delivery.**

	Gestation	28-32						32 - <37						≥37						Total
		Spontaneous			Induced			Spontaneous			Induced			Spontaneous			Induced			
		VD	CS AA	L	VD	CS	VD	CS AA	L	VD	CS	VD	CS AA	L	VD	CS				
<b>Type of abruption</b>	Concealed	23	5	3	3	4	21	3	7	2	12	26	19	13	22	20	183			
	Revealed	15	8	1	6	10	15	7	6	6	15	52	15	12	26	19	213			
	Mixed	29	7	7	2	5	22	7	7	8	8	74	30	25	21	19	271			
	<b>Total</b>	67	20	11	11	19	58	17	20	16	35	152	64	50	69	58	667			

VD - Vaginal Delivery, CS - Caesarean Section, AA - At Admission, L - Later

Of the total 211 perinatal deaths, 66 (31.4%) were NND, 84 (40%) macerated stillbirths and 61 (28.6%) fresh stillbirths. The trends in NND between gestation 28-32 weeks decreased from 25% (2 cases) in block A to 15% (5 cases) in block I, for gestation 33-36 weeks remained same 12.5% (1 case) in block A and 12.5% (3 cases) in block I also and with gestation >37 weeks actually increased from 12.5% to 18.3%, a matter of concern. Maternal case fatality has been fluctuating between 3-5% till 2004, contributed to 12-15% of overall maternal mortality, however there has been no maternal deaths due to placental abruption in last 7 years.

## DISCUSSION

Placental abruption continues to be a serious, potentially life-threatening emergency even in modern era. Timely diagnosis and early, appropriate interventions are the major challenges, till the time causes can be identified and eliminated, so that the disorder is prevented. Of 66,459 deliveries, 667 (1%) were cases of placental abruption, increasing trends from 0.73 to 1.11% between 1985-1987 and 2009-2011, reported by others also, Periente et al.,<sup>20</sup> report a rise in incidence from 0.49 to 1.8% births. Researchers report increased risk among teenagers,<sup>20</sup> in women aged 35 years and older,<sup>14-16</sup> but others have found no association with age.<sup>21</sup>

It is also not known whether age per se is a risk factor or a marker for other yet unknown risk factors. In the present study trends of teenagers were similar, but 63 (9.5%) women were of >30 years of age, higher than 5.7% overall obstetric cases, during the period of analysis. There were 246 (36.9%) primigravida, significantly less than overall 45% primigravida (P >0.002), 6.71% women had APH in previous pregnancy, 5-17% incidence has been reported by others also.<sup>17,22</sup>

Hypertension and multiple gestation have long been associated with increased risk of placental abruption and we too found the same.<sup>15,23</sup>

Association of hypertensive disorders was significantly higher (18.5%) than overall incidence of 12.5%, multiple pregnancy was 3.62%, double than of overall 1.5%.

Preterm gestation has been reported more often, (even up to 60%, by Rana et al.,<sup>24</sup> 40% by Chang et al.<sup>25</sup> and in the present analysis also, it was 37.2%, Ananth et al.<sup>17</sup> & Pariente et al.<sup>3</sup> report that small gestational age and hypertensive disorders which reflect chronic vascular dysfunction have strong association with placental abruption. In the present study FGR cases were less than overall FGR cases. Coagulopathy is a well-known complication of placental abruption. In the present analysis coagulopathy was diagnosed in six (0.96%) cases.

Placental abruption is known to be significantly associated with adverse perinatal outcome such as congenital malformations, vasa previa, low APGAR scores at 1 and 5 min <7 and perinatal mortality.<sup>3</sup> In the present analysis overall PMR in cases of placental abruption was 316.3, increased from 275.8 in block A to 296 in block I, a matter of concern especially because CB have increased. The survival of babies born with birth weight more than 2.5 kg increased from 18.5% in block A to 28.8% to block I, but the survival of babies with birth weight of less than 1.5 kg decreased from 27% in block A to 21% in block I.

CB is more often required in women with placental abruption either because of continuing haemorrhage or other organ dysfunction and/or foetal distress. In the present analysis 55.92% women had vaginal birth less often than overall 70% (P value: 0.32) and 294 (44.08%) had CS, higher than overall 30% (P value: 0.16). Some women underwent CS even with dead baby in view of deteriorating maternal condition.

The case fatality, has been fluctuating between 3 to 5% till 2004 and contribution to maternal deaths due to placental abruption to overall maternal deaths has been fluctuating between 12-15%. However, there has been no fatality in last 7 years. May be early decision to do CS did save some lives but with increased CB and increased in perinatal death also.

The sheet anchor of treatment in cases of placental abruption is resuscitation, termination of pregnancy with amniotomy and oxytocics, timely CS depending on

maternal and foetal condition, and the same has been done with some increase in CB maternal survival improved but perinatal deaths have been persisting rather increased. Cases of placental abruption have been increasing, many with no obvious cause though some cases had risk factors like hypertension, multiple pregnancy, perinatal deaths have been more in last decade though maternal deaths could be prevented. Research needs also to continue about causes so that more can be done for prevention. Awareness needs to be amongst these women and health providers for early health seeking, early diagnosis and timely appropriate management.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the institutional ethics committee*

## REFERENCES

1. Ananth CV, Smulian JC, Demissie K, Vintzileos AM, Knuppel RA. Placental abruption among singleton and twin births in the United States: risk factor profiles. *Am J Epidemiol.* 2001;153(8):771-8.
2. Konje J, Taylor D. Bleeding in later pregnancy. In: James D, Steer P, Weiner C, Gonik B, eds. *High Risk Pregnancy.* 3rd ed. Philadelphia: Pennsylvania; 2006: 1266-1271.
3. Pariente G, Wiznitzer A, Sergienko R, Mazor M, Holcberg G, Sheiner E. Placental abruption: critical analysis of risk factors and perinatal outcomes. *J Matern Fetal Neonatal Med.* 2011;24(5):698-702.
4. Tikkanen M. Placental abruption: epidemiology, risk factors and consequences. *Acta Obstet Gynaecol Scand.* 2011;90(2):140-9.
5. Hemminki E, Glebatis DM, Therriault GD, Janerich DT. Incidence of placenta previa and abruptio placentae in New York State. *NY State J Med.* 1987;87(11):594-8.
6. Nayama M, Tamakloe-Azamesu D, Garba M, Idi N, Djibril B, Kamaye M et al. Abruptio placentae. Management in a reference Nigerien maternity. Prospective study about 118 cases during one year. *Gynaecol Obstet Fertil.* 2007;35(10):975-81.
7. Brailovschi Y, Sheiner E, Wiznitzer A, Shahaf P, Levy A. Risk factors for intrapartum foetal death and trends over the years. *Arch Gynaecol Obstet.* 2012;285(2):323-9.
8. Morgan MA, Berkowitz KM, Thomas SJ, Reibold P, Quilligan EJ. Abruptio placentae: perinatal outcome in normotensive and hypertensive patients. *Am J Obstet Gynaecol.* 1994 Jun;170(6):1595-9.
9. Witlin AG, Sibai BM. Perinatal and maternal outcome following abruptio placentae. *Hypertens Pregnancy.* 2001;20(2):195-203.
10. Furukawa S, Sameshima H, Ikenoue T, Ohashi M, Nagai Y. Is the perinatal outcome of placental abruption modified by clinical presentation? *J Pregnancy.* 2011;2011:659615.
11. Tikkanen M, Gissler M, Metsaranta M, Luukkaala T, Hiilesmaa V, Andersson S et al. Maternal deaths in Finland: focus on placental abruption. *Acta Obstet Gynaecol Scand.* 2009;88(10):1124-7.
12. Ananth CV, Oyelese Y, Yeo L, Pradhan A, Vintzileos AM. Placental abruption in the United States, 1979 through 2001: temporal trends and potential determinants. *Am J Obstet Gynaecol.* 2005 Jan;192(1):191-8.
13. Sheiner E, Shoham-Vardi I, Hadar A, Hallak M, Hackmon R, Mazor M. Incidence, obstetric risk factors and pregnancy outcome of preterm placental abruption: a retrospective analysis. *J Matern Fetal Neonatal Med.* 2002 Jan;11(1):34-9.
14. Sheiner E, Shoham-Vardi I, Hallak M, Hadar A, Gortzak-Uzan L, Katz M et al. Placental abruption in term pregnancies: clinical significance and obstetric risk factors. *J Matern Fetal Neonatal Med.* 2003 Jan;13(1):45-9.
15. Abu-Heija A, al-Chalabi H, el-Iloubani N. Abruptio placentae: risk factors and perinatal outcome. *J Obstet Gynaecol Res.* 1998 Apr;24(2):141-4.
16. Oyelese Y, Ananth CV. Placental abruption. *Obstet Gynaecol.* 2006 Oct;108(4):1005-16.
17. Ananth CV, Smulian JC, Vintzileos AM. Incidence of placental abruption in relation to cigarette smoking and hypertensive disorders during pregnancy: a meta-analysis of observational studies. *Obstet Gynaecol.* 1999 Apr;93(4):622-8.
18. Keyes LE, Armaza JF, Niermeyer S, Vargas E, Young DA, Moore LG. Intrauterine growth restriction, preeclampsia, and intrauterine mortality at high altitude in Bolivia. *Paediatr Res.* 2003 Jul;54(1):20-5.
19. Browne VA, Toledo-Jaldin L, Davila RD, Lopez LP, Yamashiro H, Cioffi-Ragan D et al. High-end arteriolar resistance limits uterine artery blood flow and restricts fetal growth in preeclampsia and gestational hypertension at high altitude. *Am J Physiol Regul Integr Comp Physiol.* 2011;300(5):R1221-9.
20. Kramer MS, Usher RH, Pollack R, Boyd M, Usher S. Etiologic determinants of abruptio placentae. *Obstet Gynaecol.* 1997;89(2):221-6.
21. Ananth CV, Wilcox AJ, Savitz DA, Bowes WA, Jr., Luther ER. Effect of maternal age and parity on the risk of uteroplacental bleeding disorders in pregnancy. *Obstet Gynaecol.* 1996;88(4 Pt 1):511-6.
22. Tikkanen M, Nuutila M, Hiilesmaa V, Paavonen J, Ylikorkala O. Prepregnancy risk factors for placental abruption. *Acta Obstet Gynaecol Scand.* 2006;85(1):40-4.
23. Salihu HM, Bekan B, Aliyu MH, Rouse DJ, Kirby RS, Alexander GR. Perinatal mortality associated with abruptio placenta in singletons and multiples. *Am J Obstet Gynaecol.* 2005;193(1):198-203.
24. Rana A, Sawhney H, Gopalan S, Panigrahi D, Nijhawan R. Abruptio placentae and chorioamnionitis-microbiological and histologic



correlation. *Acta Obstet Gynaecol Scand.* 1999;78(5):363-6.

25. Chang YL, Chang SD, Cheng PJ. Perinatal outcome in patients with placental abruption with and without

antepartum hemorrhage. *Int J Gynaecol Obstet.* 2001;75(2):193-4.

DOI: 10.5455/2320-1770.ijrcog20140937

**Cite this article as:** Chhabra SA, Pandit V, Gosavi M. Placental abruption: a persisting killer. *Int J Reprod Contracept Obstet Gynecol* 2014;3:604-9.