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Placental Abruption: An Obstetricians Nightmare – A Study of Risk Factors and Maternofoetal Outcomes at Two Tertiary Care Teaching Hospitals in South India

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ABSTRACT

Background: Abruptio placenta is a dire obstetric emergency with potentially life threatening consequences to the mother and the baby. **Methods:** A prospective observational study was conducted over a period of 30 months at two tertiary care medical college hospitals in Hyderabad with 274 patients with confirmed diagnosed of placental abruption. Data was collected from case sheets, questionnaires and interviewing after obtaining an informed consent. **Results:** The incidence of placental abruption was 1.52%. A higher incidence was noted in multiparous patients, women from lower socioeconomic status and lower BMI. Previous history of cesarean section and gestational hypertension, Polyhydramnios and PROM emerged as leading associated risk factors (25.54%, 24.8%, 14.96% and 11.31% respectively). 63.13% of patients had revealed and 36.86% had concealed haemorrhage. Anaemia was the commonest maternal complication (57.66%) followed by hypovolaemic shock (25.18%) and PPH (23.72%). Maternal mortality was 11.67%. Perinatal mortality was 60.94% with 55.1% still births and 5.84% early neonatal deaths. **Conclusions:** Despite advances in obstetrics, placental abruption still remains an unpredictable and unpreventable disaster. An understanding of predisposing factors and maternofoetal outcomes will help us manage these cases with a foresight.

Keywords: Abruptio Placenta, Associated risk factors, Materal-fetal outcomes, Mode of delivery.

Introduction

The Royal College of Obstetricians and Gynaecologists (RCOG) defines antepartum haemorrhage (APH) as bleeding from or in to the genital tract after 24^{+0} weeks till the birth of the baby, and recognizes abruptio placenta (AP) as an important cause of APH [1]. AP refers to premature separation of a normally situated placental before the delivery of the foetus. AP complicates approximately 1% of all pregnancies [2] and accounts for 20 – 25% of all cases of APH [3].AP occurs due to rupture of spiral arteries which causes bleeding and leads to haematoma formation in decidua basalis. This separates the placenta from the uterine wall. The haematoma enlarges and further increases the space between the chorionic and decidual plates. The detached portion of placenta then becomes incapable of nutrient and gaseous exchange.AP is classified into concealed and revealed types. In concealed type the blood collects behind the placenta and there is no evidence of vaginal bleed whereas in revealed variety the blood tracks down between the membranes and the uterine wall to present through the vagina. The primary cause of AP in majority of the cases remains unknown [4] but the RCOG recognizes pregnancy induced hypertension (PIH), pre-eclampsia, advanced maternal age, multiparity, premature rupture of membranes (PROM), smoking, polyhydramnios, abdominal trauma, fetal growth restriction, intrauterine infections and past history of abruption as predisposing risk factors [1]. A tenfold increased risk is reported in subsequent pregnancies with the diagnosis of AP [5]. Several other risk factors with possible aetiological relationships include low socioeconomic strata,

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gestation with male fetus, gestation at higher altitudes, twinning, drug addiction, infections, thrombophilias and diabetes [6,7]The clinical hallmarks of AP are abdominal pain and vaginal bleed with which most patients usually present [8].The RCOG recommends that the process of triage essentially include history of pain and extent of vaginal bleed followed by an assessment of maternal cardiovascular condition. Only then should assessment of foetal well being be attempted [1]. The RCOG also recognizes the value of abdominal palpation in the diagnosis of abruption [1].

AP is a major cause of maternal and perinatal, morbidity and mortality [9]. Abruptio is associated with maternal complications like, disseminated intravascular coagulopathy (DIC), maternal shock, acute renal failure (ARF), postpartum haemorrhage (PPH) and anaemia [1, 10]. It is also associated with undesirable foetal outcomes due to hypoxia, prematurity, growth restriction and fetal death [1, 11]. Most of the perinatal mortality is attributable to death within the uterus [12].The aim of the study was to determine the incidence and to evaluate the risk factors that predispose to placental abruption. The primary outcomes also included the occurrence and frequency of various maternal complications apart from evaluation of foetal and neonatal outcomes in patients with AP.

Patients and Methods

The study was conducted at the Department of Obstetrics and Gynaecology at Shadan Institute of Medical Sciences, Peerancheru, Hyderabad and ESIC Medical College, Sanathnagar, Hyderabad. Shadan Institute of Medical Sciences is a tertiary care teaching hospital catering to the rural population of Ranga Reddy District and ESIC Medical College is a tertiary care teaching hospital and a referral centre to 35 ESIC dispensaries and hospitals. The study was conducted over a period of two and a half years from August 2014 to February 2017 as a prospective observational study after approval from Institutional Ethics Committee. All cases presenting with vaginal bleed after 24 weeks of gestation were admitted on emergency basis. AP was diagnostically differentiated by presenting symptoms and signs. Diagnosis was confirmed later by placental examination. Gestational age from dating scan was considered for all purposes.Patients presenting with features suggestive of AP were clinically evaluated and worked up immediately with blood counts, coagulation profile, urea, electrolytes and liver function tests. In accordance with RCOG guidelines the mother was prioritised and was stabilized before assessing the foetal condition by ultrasonography and cardiotocography. The severity of abruption was assessed by modified Sher and Shetland classification proposed by Gaufberg Slava [4, 13]. Immediate management measures were then initiated. The mode of delivery was decided on the basis of maternal condition and foetal status. Neonates with asphyxia were immediately provided with resuscitation in accordance with IAP-ANRP guidelines (Indian Academy of Paediatricians – Advanced Neonatal Resuscitation Program). The diagnosis was confirmed by gross examination of placenta after delivery by the presence of a retroplacental clot or depression on the maternal surface. The clot was carefully removed and weighed.All patients with confirmed abruption were traced from the parturition registers and the subjects were informed about the purpose of the study. Those patients who willingly accepted to participate in the study were then registered. A detailed pro-forma regarding the obstetrics history, course of pregnancy, clinical presentation, mode of delivery, maternal complications, perinatal and neonatal outcomes were recorded from the patient's and neonate's case sheets. The subjects were then interviewed to further investigate the predisposing risk factors and demographic data was collected. Socioeconomic status was calculated by modified Kuppuswamy scale [14] using SES online tool (http://scaleupdate.weebly.com/) for respective years. Booked status of a case was determined by presence of at least three antenatal visits with at least one ultrasound examination done in second trimester with 100 Iron-folate tablets taken with two doses of tetanus toxoid administered within one month interval. Those who did not fulfill any of the criteria were termed unbooked. Post partum depression was evaluated by Edinburg scale [15]. All information was then analysed by calculating percentages. Correlations were calculated using Pearson's Coefficient Correlation by online calculators at http://www.socscistatistics.com.

Results

A total of 17,954 patients were admitted to 'labour room' in both the departments during the study period of 30 months. Among these 274 were confirmed to have AP, which brings the incidence to 1.52%. The commonest age of presenting with AP was 21 to 30 years. A higher incidence of AP was seen in women from lower socio economic backgrounds, with 59.48% of all abruptions in upper lower class and lower class itself. Women with lower body mass index (BMI) contributed a higher proportion to AP, compared to women with higher BMI. Primi patients constituted only 6.93% of all cases of AP. Majority of the patients

were un-booked (59.48%). Table 1 illustrates the demographic distribution of patients.

Table 1: Demographic characteristics

S.No.	Demographic Parameter	Demographic variable	TD N = 17954	Percentage	Patients with AP n = 274	Percentage
1.	Age	< 20 years	1431	7.97%	10	3.65%
		21 – 30 years	10956	61.02%	131	47.81%
		31 – 40 years	4504	25.08%	117	42.7%
		>40 years	1063	5.92%	16	5.8%
2.	Socioeconomic Class	Kuppuswamy I	1613	8.98%	9	3.28%
		Kuppuswamy II	2156	12%	39	14.23%
		Kuppuswamy III	3818	21.26%	63	23%
		Kuppuswamy IV	5516	30.72%	98	35.76%
		Kuppuswamy V	4851	27%	65	23.72%
3.	Body Mass Index (BMI)	<18.5 kg/m^2	3779	21.05%	46	16.79%
		18.5 – 24.9 kg/m^2	6828	38.03%	96	35.03%
		25 – 29.9 kg/m^2	5036	28.04%	65	23.72%
		30 – 34.9 kg/m^2	1238	6.9%	40	14.60%
		35 – 39.9 kg/m^2	721	4.01%	23	8.4%
		>40kg/m^2	352	1.97%	4	1.46%
4.	Parity	Primigravida	5526	30.78%	19	6.93%
		Primipara (G2P1)	3896	21.7%	26	9.49%
		Para 2 (G3P2)	3526	19.63%	61	22.26%
		Para 3 (G4P3)	2763	15.39%	76	27.74%
		Para 4 (G5P4)	1675	9.33%	65	23.72%
		Multigravida	568	3.16%	27	9.85%
5.	Antenatal Care	Reg. Booked	6077	33.84%	39	14.23%
		Reg. Un-booked	2183	12.15%	57	20.8%
		Ref. Booked	5235	29.15%	72	26.27%
		Ref. Un-booked	4459	24.83%	106	38.68%

Reg – Registered, Ref – Referred

Among medical disorders the spectrum of PIH appeared to be most commonly associated factor in 27.72% of all AP cases. Gestational Diabetes (GDM), chronic hypertension and thrombophilias were seen in 9.12%, 6.93% and 1.82% of AP patients respectively. Previous history of AP appeared to be an important associated factor (29 patients - 10.58%). A history of threatened miscarriage was found in 9.48% (26 patients). Active or passive smoking was seen in 49 patients (20.43%). 5.84% (16 patients) presented with blunt trauma abdomen. Other risk factors evaluated are tabulated in table – 2

Table 2: Association of Predisposing Risk Factors

S.No.	Risk Factors		No. of Patients with AP	Percentage
1.	Medical Disorders	PIH	39	14.23%
		Pre Eclampsia	29	10.58%
		Eclampsia	8	2.91%
		HELLP Syndrome	3	1.09%
		Chronic Hypertension	19	6.93%
		Gestational Diabetes	25	9.12%
		Thrombophilias	5	1.82%
2.	Past Obstetric history	Past H/o Abruption	29	10.58%
		Past H/o Cesarean Section	89	32.48%
		Past H/o first trimester bleed (present gestation)	26	9.48%
3.	Addictions	Smoking (Active / Passive)	49	20.43%
		Tobacco Chewing	6	2.19%
4.	Trauma		16	5.84%
5.	PROM		31	11.31%
6.	PROM + Intrauterine Infection		9	3.28%
7.	Polyhydramnios		41	14.96%
8.	Pregnancy after Assisted Reproductive Techniques		12	4.38%
9.	Multiple gestation		7	2.55%
10.	Non Vertex Presentation		8	2.92%

HELLP – Haemolysis, Elevated Liver enzymes and Low Platelet count

52.55% of the patients (144) presented with Class – 3 severity whereas 25.91% and 21.53% presented with class – 2 and class -1 severity respectively as shown in table 3.

Table 3: Severity at presentation

S.No.	Class	Criteria	No. of Patients with AP n = 274	Percentage
1.	Class 0	Asymptomatic	0	--
2.	Class 1	No vaginal bleeding to mild vaginal bleeding, slightly tender uterus, normal maternal B.P and heart rate, no coagulopathy and no foetal distress	59	21.53%
3.	Class 2	No bleeding to moderate vaginal bleeding, moderate to severe uterine tenderness with possible tetanic contractions, maternal tachycardia with orthostatic changes in blood pressure and heart rate, foetal distress and hypo fibrinogenemia	71	25.91%
4.	Class 3	Severe abruption, no vaginal bleeding to heavy vaginal bleeding with very painful tetanic uterus, maternal shock, hypo fibrinogenemia, coagulopathy and foetal death.	144	52.55%

Table 4 illustrates the presentation of patients with AP on admission. 149 patients (54.38%) presented with abdominal pain and vaginal bleed, 51(18.61%) presented with abdominal pain alone and 74(27%) presented with vaginal bleed alone. 56.92% (n = 154) of the patients were post maturity whereas 43.79% (n = 120) were preterm at presentation. 63% of the patients had revealed type whereas 36% had concealed abruption. On obstetric examination fundal height was more that gestational age in 53 patients (19.34%). 35.67% patients had retroplacental clot weighing 500 to 1500 gm in 14 patients (5.1%) it weighed more than 1500 gm. 56 patients (20.43%) and 106 patients (38.68%) had clots weighing less than 250 and 500 gms respectively.

Table 4: Presentation of patients at admission

S.No	Presentation		No. of Patients with AP(n = 274)	Percentage
1.	Symptomatology	Pain Abdomen (continuous)	51	18.61%
		Per vaginal bleed	74	27.0%
		Both	149	54.38%
2.	Type of Abruptio	Revealed	173	63.13%
		Concealed	101	36.86%
3.	Gestational age at presentation	Pre term <37^{+7} weeks	120	43.79%
		Term > 37^{+7} weeks	148	54.01%
		Post term > 42^{+0} weeks	6	2.19%
4.	Fundal Height and Gestational age	Less than gestational age	24	8.75%
		Corresponds to gestational age	197	71.89%
		More than gestational age	53	19.34%
5.	Amount of Retroplacental clot	50 – 250 gm	56	20.43%
		250 – 500 gm	106	38.68%
		500 – 1500 gm	98	35.67%
		>1500gm	14	5.1%

Fig 1 shows the mode of delivery in patients with AP. 126 patients were delivered by cesarean section (45.99%). 118 patients (43.06%) had spontaneous vaginal delivery. 30 patients had operative vaginal delivery (10.95%) in view of intrapartum foetal distress to shorten the second stage.

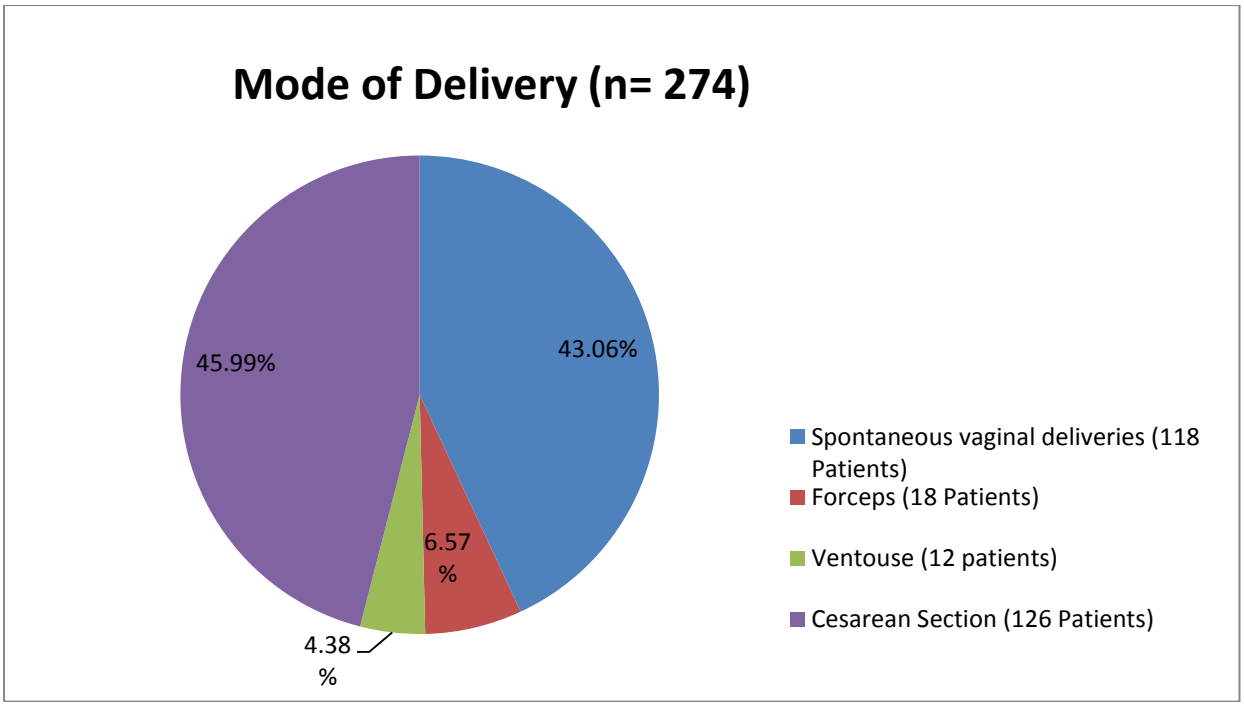

Fig 1: Mode of Delivery in AP patients

Anaemia appeared as the most common complication (57.66%) followed by hypovolaemic shock (25.18%) and PPH (23.72%). DIC and ARF occurred in 35(12.77%) and 18(6.57%) patients respectively. Post partum depression was seen in 79 patients (28.83%). Blood transfusion related complications were seen in 10 patients (5.78%) out of the 173 patients (63.14%) who required transfusion. Maternal mortality was 11.67%. Maternal complications have been listed in table 5

Table 5: Maternal complications

S.No.	Complication	No. of Patients n = 274	Percentage
1.	Anaemia	158	57.66%
2.	Hypovolemic Shock	69	25.18%
3.	PPH	65	23.72%
4.	DIC	35	12.77%
5.	ARF	18	6.57%
6.	Puerperal Sepsis	29	10.58%
7.	Post Partum Depression	79	28.83%
8.	Prolonged hospital stay (> 7 days)	126	45.98%
9.	Blood Transfusion	173	63.14%
10.	Blood transfusion complications	10	3.64%
11.	Maternal Deaths	32	11.67%

Table 6 incorporates foetal and neonatal outcomes. 27.7% showed intrapartum foetal distress (76 foetuses) at presentation. Only 50% weighed above 2.5kg and among the rest 47.45% were low birth weight and 2.55% were macrosomic at the time of delivery. 151 still births (55.1%) were recorded with majority (30.29%) occurring as intra uterine foetal deaths and 24.81% occurring as intrapartum deaths. Only 123 live births were recorded (44.89%) with 45 of these babies (36.58%) requiring NICU admission. 16 babies died in the first week of life (5.84%). Total perinatal mortality was 60.94% (167 babies).

Table 6: Pregnancy outcomes

S.No.	Characteristic	Outcomes	No. of Patients n = 274	Percentage
1.	Foetal weight	ELBW (< 1 kg)	12	4.38%
		VLBW (< 1.5kg)	36	13.13%
		LBW (< 2.5kg)	82	29.9%
		Normal (2.5 – 4 kg)	137	50%
		Macrosomia (> 4 kg)	7	2.55%
2.	Still Births 151 (55.1%)	Intra Uterine Foetal Death	83 (54.9% of still birth)	30.29%
		Intranatal Death	68 (45.03% of still births)	24.81%
3.	Live births		123	44.89%
4.	Foetal Distress		76	27.7%
5.	NICU Admissions		45	36.58%
6.	Early Neonatal deaths		16	5.84%
7.	Perinatal mortality	Still Births and Early Neonatal Deaths	167	60.94%

Figure 2 and 3 shows APGAR scores in live born babies at 1 minute and 5 minutes after birth. 5 minute APGAR scores showed improvement with neonatal resuscitation provided when required (IAP-ANRP Guidelines)

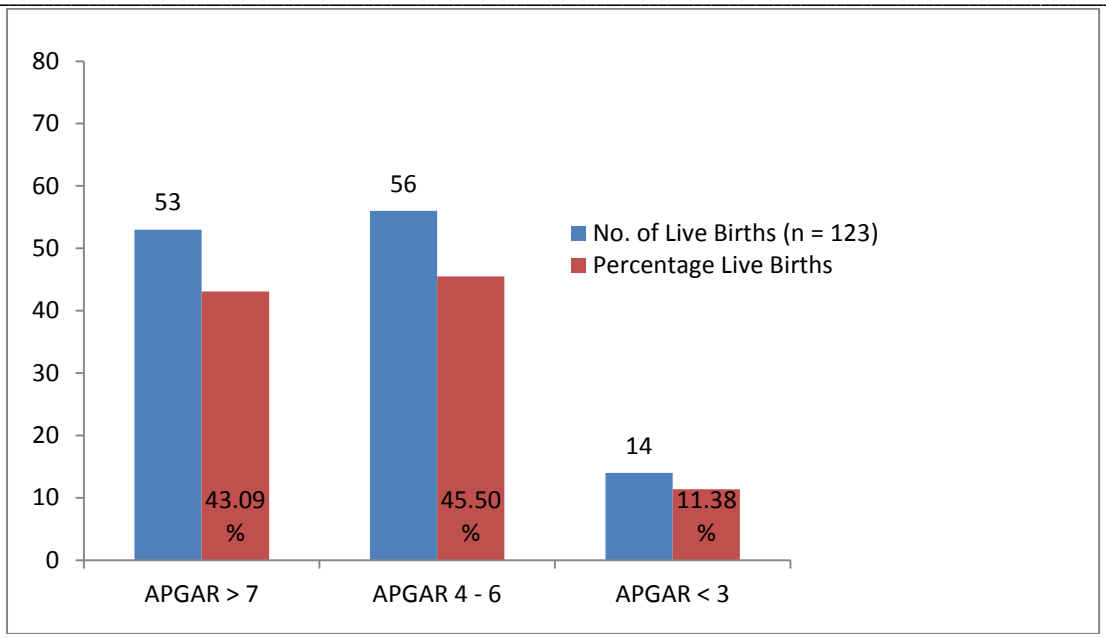

Fig 2: APGAR scores at 1 minute of life

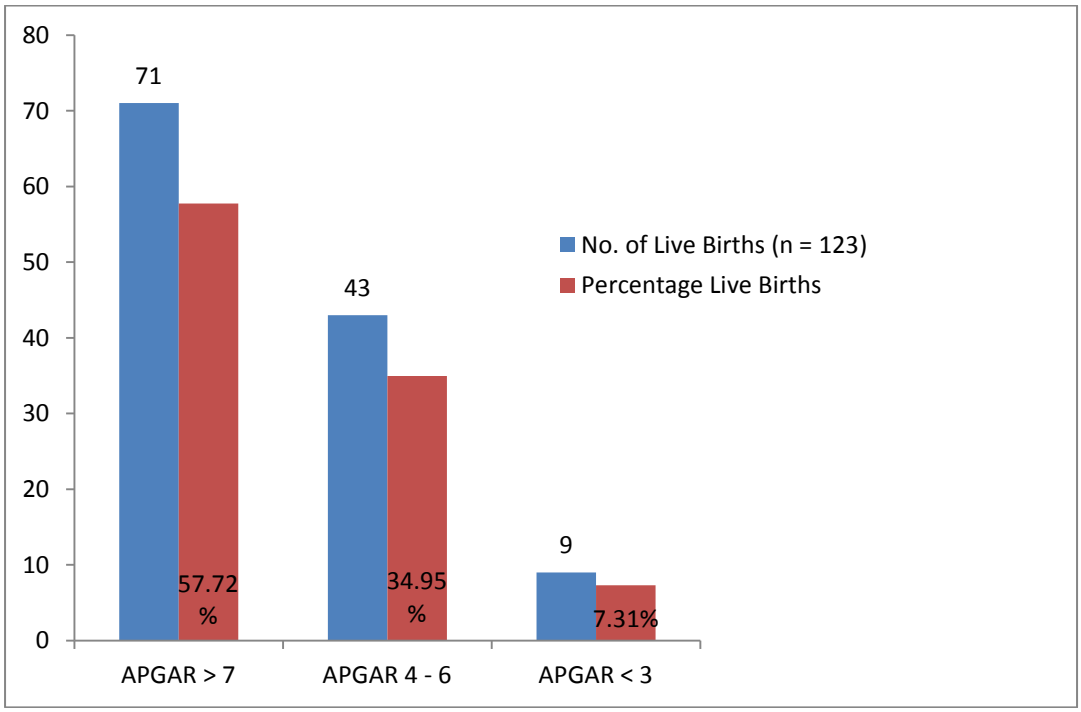

Fig 3: APGAR scores at 5 minutes of life

Discussion

Placental abruption or accidental haemorrhage is a dreaded obstetric emergency owing to its adverse maternal and foetal outcomes. AP is potentially life threatening to the mother and her foetus. We report an incidence of 1.52%. Ananth et al [2] reported an incidence of 1% and Sumangala et al [3] reported an incidence of 0.9%. Choudhary et at [12] and Shrivastava et al [8] reported an incidence of 4.81% and 2.78% respectively in Indian patients. Jabeen et al [16] from Pakistan reported an incidence of 4.5%. More cases were seen in mothers aged 21 – 30 years. Coleman et al reported a higher incidence of AP in 20 – 29 years mothers[4] but Jabeen et al [16] reported a higher incidence in 36 – 40 years old mothers. Most of the mothers belonged to lower socioeconomic status with 59.48% of all affected mothers belonging to lower socioeconomic class (Kuppuswamy IV and V). AP was seen more commonly in mothers with lower BMI which reflects lower food availability and poverty.

Jabeen et al [16] reported a higher incidence of AP in women with low monthly income and Coleman et al reported 36% of AP mothers came from lower economic backgrounds. AP was observed in women with higher parity with 83.57% of all cases being birth order gravida 3 or higher. These findings appear to be consistent with Jabeen et al [16] and Coleman et al[4]. Srivastava et al also reported 87% mothers with AP being multiparous in contrast to 13% being primi. Registered cases showed a lower incidence of 35.03% compared to 64.95% in referred cases. This reflects a lower availability and quality of antenatal care at primary health centre as cases registered with us (tertiary care centre) showed lower incidence. Booked cases showed an incidence of 40.5% which was lower than 59.48% in unbooked cases. Antenatal booking shows a determined pattern of care received by the mother and willingness to present to health care facilities for safe motherhood and healthy child. This is more significant in our area as attending antenatal care implies foregoing daily wages and financial loss for a day. Our findings are in agreement with Sheiner et al who reported a higher incidence of AP in unbooked mothers [17].Among medical disorders the PIH spectrum appeared to be the commonest associated factor in 27.72% mothers. 6.93% of mothers had chronic hypertension. Chang et al reported that increased blood pressure in pregnancy is the most common risk factor linked to AP [18]. The role of hypertensive disorders in AP remains inconclusive but Williams et at [19] and Abu-Heija et al [20] have provided evidence which strongly links the association of these factors. Our findings are in agreement with Abdella et al who reported 25.9% of patients with AP had gestational hypertension and 10% had chronic hypertension[21]. Diabetes can cause and aggravate placental dysfunction which could cause abruption [22]. We report a 9.12% association of GDM which is in agreement with Choudhary et al [12] and Jabeen et al [16] who reported 12.09% and 9.93% respectively. Sumangala et al reported a lower association of 6.40% [3]. Though active smoking is rare among women in our setting passive smoking appears to be strongly associated to an extent of 20.43% with husband being the most common source of cigarette smoke. Anaemia is also supposed to be a predisposing factor for AP as it alters foetoplacental angiogenesis in early pregnancy [23]. We have considered this in later section. Previous history of cesarean section appears to be associated (32.48%) with AP. Similar association has been reported by Nayama et al [24]. This has been attributed by Choudhary et al to a damage of basal layer of endometrium which would adversely affect neo-angiogenesis in pregnancy[12]. An association between previous abruption and recurrence is seen to an extent of 10.58%. A lesser association(7.25%) is reported by Choudhary et al [12]. History of threatened miscarriage in current pregnancy appears to be strongly associated (9.48%) which could be due to early placental damage at the time of initial separation and hypoxemic insult. Trauma appears to be incident in our study to an extent of 5.84% which is in consistency with the findings of Choudhary et al (4.02%) and Colleman et al (7%) [12,4]. Cheng et al reported severe abdominal trauma to be associated with 6 fold increase in AP [25]. Dahmus and Sibai reported that 1.5% - 9.4% of all cases of AP occur due to abdominal trauma[26]. PROM also appears to be associated in 11.31% of affected mothers. Bibi et al reported PROM to be a significant cause of AP [22]. Our findings appear to reflect more strong associations be more strongly associated than those reported by Colleman et al (3%), Jabeen et al (3.3%) and Sumangla et al (2.10%) but less association with the findings of Choudhary et al (16.94%) [4,16,3,12].

Polyhydramnios, Multiple gestation and non vertex presentation also appear to be associated with AP. Associated medical and obstetric factors appear to occur at higher rates in our study as both the hospitals are tertiary care centers where patients with complications and associated co morbidities are referred. A higher percentage of patients presented with more severity on a clinical classification scale. This could be attributed to a reduced health seeking

behavior in the studied population, non institutional delivery and the distance needed to travel to reach the tertiary care centre after referral from primary health centers which becomes more difficult in face of lack of public and health transportation systems. We report 63.13% of all patients having revealed variety of AP whereas a lower occurrence concealed variety (36.86%). Morgan et al reported similar figures with 65 - 80% having revealed variety and 20 – 35% having concealed variety[27]. Out of the 274 patients, 149(54.38%) presented with pain abdomen and vaginal bleed, 27% had only vaginal bleed and, 18.61% had only continuous abdominal pain. Our findings are well in line with Sumangala et al [3] who reported 14% presenting with pain, but reported 45% with vaginal bleed and 22% with both. Coleman also reported the commonest presentation as vaginal bleed with proportions of 87% [4]. 50.48% of concealed haemorrhages presented with continuous abdominal pain alone at presentation. Most of the presenting mothers were term gestations (54.01%) followed by preterm births (43.79%) and a very few cases were seen in post term gestations (2.19%). Shrivastava et al [8] also reported highest incidence of AP in term gestations whereas Coleman et al reported mean gestational age at presentation to be 34 weeks[4]. Bibi et al also reported 32 – 36 weeks as the most vulnerable period for the occurrence of AP [22]. Our findings could be consistent with Shrivastava et al [8] as both these studies were conducted in medical college hospitals which are tertiary care centers in India with emergency referrals from a variety of sources like primary health centres, private hospitals and nursing homes and ESIC referral system. In most of the cases (71.89%) fundal height corresponded well with gestational age but in 53 cases (19.34%) fundal height was more than gestational age and in 8.74% it was less than gestational age. Majority of patients (38.68%) had retroplacental clots measuring 250 – 500gm followed by 35.67% having less than 1500gm but more than 500gm and only 20.43% had clots less than 250gm. This appears to be in somewhat agreement with findings of Jabeen et at [16] who reported 39.7% with clots less than 1500gm and more than 700gm, but appears to be in striking contrast to findings of Sumangala et al [3] who reported majority (65%) had clots weighing less than 250gm and only 15.7% patients with clots weighing less than 500gm. Commonest mode of delivery was by abdominal route with 45.99% (126) being taken for cesarean section followed by spontaneous vaginal delivery accounting to 43.06% (118). Instrumental vaginal deliveries accounted for 10.9% with forceps being applied to 18 patients (6.57%) and ventouse used in 12 patients (4.38%). Instrumental vaginal delivery was inevitably done in view of foetal distress to shorten second stage. Our rates closely resemble those of Choudhary et al from the same state [12].The mode of delivery is variable as different studies have described uncomparable cesarean section rates (Tale 7). This could be attributed to institutional protocols, consultant habits, on call practices and more importantly due to the condition of the foetus at presentation. Cesarean section does not seem to affect foetal outcomes (weak negative correlation) as illustrated in Table 7.

Table 7: Comparison of mode of delivery in various studies

S.No.	Jabeen et al[16]	Shrivastava et al [8]	Choudhary et al [12]	Ismail et al [Present study]	Sumangala et al [3]
Cesarean section rate (%)	7.49	26	45.97	45.99	57.9
Still birth rate (%)	50.63	37.7	52.42	55.1	30.1
Coefficient of Correlation 'R' - (- 0.2789)					
Coefficient of Determination 'R^2' – 0.0778					

Table 8 compares various maternal and foetal outcomes observed in different studies. We have tried to assess contributory factors towards maternal and foetal deaths and perinatal mortality. Various studies describe uncomparable maternal and foetal outcomes as shown below. Shock appears to adversely affect maternal outcomes (R – 0.51). Maternal DIC appears to adversely affect live births. Maternal shock, DIC and factors predisposing to PPH also appear to adversely affect perinatal outcomes. Our study reports a very high maternal mortality which is attributable to referral of complicated cases at both the centres and various social factors which play in delaying the arrival of patient to the hospital. Perinatal mortality is well in line with the results of Choudhary et al at a medical college from the same state. We have considered anaemia as a complication of AP, but several studies mention anaemia as an important predisposing factor.

Table 8: Various maternal and foetal outcomes observed in different studies

Morbidity Factors								Outcomes		
Findings (%)	Vaginal Rates	Delivery	Shock	Anaemia	PPH	DIC	ARF	MDs (1)	LBs(2)	PeMo (3)
Choudhary et al [12]	54.03		12.9	57.26	22.59	20.16	10.48	0	47.58	58.70
Sumangala et al [3]	42.1		2.1	45	2.7	3.2	1.4	0	69.9	34.1
Coleman et al [4]	17		32	24	20	11	6	2	43	65
Nandone [28]	47.4		17.9	93.7	36.8	3.5	31.6	3.2	65.3	54.8
Jabeen et al [16]	92.51		0.66	86.09	14.57	16.55	1.98	1.32	49.36	-
Shrivastava et al [8]	74		24.6	-	13	7.24	4.34	-	62.3	40.5
Poovathi et al [29]	19.7		-	-	9.8	7.8	4.7	1.9	58.8	-
Ismail et al	54.01		25.18	57.66	23.72	12.77	6.57	11.67	44.89	60.9
R_1	0.0615		**0.5131**	0.0557	0.3713	0.0239	0.0841	-	-	-
$(R_1)^2$	0.0038		0.2633	0.0031	0.1379	0.0006	0.0071			
R_2	0.0007		-	0.3122	-	**-0.8104**	0.2273	-	-	-
$(R_2)^2$	0		0.3827	0.0975	0.2685	0.6567	0.0517			
			0.1465		0.0721					
R_3	-0.4401		**0.6422**	-0.0684	**0.6972**	**0.6118**	0.2975	-	-	-
(R_3)	0.1937		0.4124	0.0047	0.4861	0.3743	0.0885			

MDs – Maternal Deaths, LBs – Live Births, PeMo – Perinatal Mortality
Coefficient of Correlation - R | Coefficient of Determination - R^2
R_1 – Relationship between factor and Maternal Deaths (1)
R_2 - Relationship between factor and Live Births (2)
R_3 - Relationship between factor and Perinatal mortality (3)

Foetal distress seen in our study is similar to the findings of Nandone [28], 27.7% and 21.06% respectively. At birth Nandone [28] reported 25.3% of his neonates presented with APGAR scores less than 7 which is in sharp contrast to our findings with 56.88% of neonates presenting with scores less than 7 which improved by 25% in the next five minutes with appropriate neonatal intervention to 42.26%.

Conclusion

Abruptio Placenta remains a dreaded obstetric presentation which can give nightmares to an obstetrician. The maternal and foetal outcomes with AP continue to be horrendous despite several advances in obstetrics, intensive care medicine and neonatalogy. Further studies and systematic reviews are required to establish clear associations between suspected associated risk factors and the causes of undesirable maternal and foetal outcomes.

Declaration

Ethical approval: The study was approved by the Institutional Ethics Committee of Shadan Institute of Medical Sciences and ESIC Medical College.

References

1. Green top guideline No. 63. Antepartum haemorrhage. Royal College of Obstetricians and Gynaecologists 2011; 1-28
2. Ananth CV, Berkowitz GS, Savitz DA, Lapinski RH. Placental abruption and adverse perinatal outcomes. JAMA 1999;282:1646–1651.
3. Sumangala Devi, Bindu VijayKumar, Madhuri Joshi. Feto Maternal Outcomes in Abruptio Placenta. IJSR 2016;5(11):669-672
4. Jerry Coleman, Emmanuel K. Srofenyo, Eric K. Ofori, Edmund K. Brakohiapa, William K. Antwi . Maternal and Fetal Prognosis in Abruptio Placentae at Korle-Bu Teaching Hospital, Ghana. African Journal of Reproductive Health 2014;18(4):115-122
5. Ngeh N, Bhide A. Antepartum haemorrhage. Current Obstetrics and Gynecology 2006;16:79-83.
6. Oyelese Y, Ananth CV. Placental abruption. Obstet Gynecol 2006;108:1005–1016.
7. Hurd WW, Miodovnik M., Hertzberg V, Lavin JP. Selection and management of abruptio placentae: a prospective study. Obstet Gynecol 1983;61:467-473.

8. Vartika Shrivastava, Pushpa Kotur, Abhinav Jauhari. Maternal and fetal outcome among abruptio placentae cases at a rural tertiary hospital in Karnataka, India: a retrospective analysis. Int J Res Med Sci 2014;2(4):1655-1658.

9. Neilson JP. Interventions for treating placental abruption. J Obstet Gynaecol 2001;21(5):443-447.

10. 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;24:698-702

11. Ananth CV, Berkowitz GS, Savitz DA, Lapinski RH. Placental abruption and adverse perinatal outcomes. J Clin Epidemiol 1999;52(5):453-461.

12. Vrunda Choudhary , Sonali Rathi Somani , Shashikanth Somani. Evaluation of Risk factors and Obstetric and Perinatal Outcome in Abruptio Placenta. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) 2015;14(5)(VII):36-39.

13. Usui R., Matsubara S., Ohkuchi A. Fetal heart rate patterns reflecting the severity of placental abruption. Archives of Gynecology and Obstetrics 2007; 277:249-253.

14. Kuppuswamy's Socioeconomic Status Scale – Revision for 2011 and Formula for Real-Time Updating. The Indian Journal of Pediatrics 2012;79(7):961–962

15. Cox, J.L., Holden, J.M., and Sagovsky, R. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. British Journal of Psychiatry 1987;150:782-786.

16. Musarrat Jabeen, Fouzia Gul**.** Abruptio Placentae: Risk factors and Perinatal outcome. Abruptio Placentae 2014;18(4):669-676

17. Sheiner E, Shoham Vardi I. Placental abruption in term pregnancies: Clinical significance and obstetric risk factors. J Matern Fetal Neonatal Med 2003;13(1):45–49.

18. Chang YL, Chang SD, Cheng PJ. Perinatal outcome in patients with placental abruption with and without antenatal haemorrhage. International Journal of Gynecol and Obstet 2001;75:193-194.

19. Williams MA, Mittendorf R, Monson RR. Chronic hypertension, cigarette smoking, and abruptio placentae. Epidemiology 1991;2(6):450-453

20. Abu-Heija A, Al-Chalabi H, El-Iloubani N. Abruptio placentae: risk factors and perinatal outcome. J Obstet Gynaecol Res 1998;24(2):141-144.

21. Abdella TN, Sibai BM, Hays JM Jr, Anderson GD. Relationship of hypertensive disease to abruptio placentae. ObstetGynecol 1984;63:365-370

22. Bibi S, Ghaffar S, Pir MA, Yousfani S. Risk factors and clinical outcome in placental abruption: a retrospective analysis. Journal of Pak Medical Association 2009;59(10):672-674.

23. Arnold DL, Williums M A, Miller R S, Qiu C ,Sorensen T K. Iron deficiency anaemia, cigarette smoking and risk of abruption placentae . Am J Obstet Gynaecology Res 2009;35(3):446-452.

24. Nayama M, Tamakloé-Azamesu D, Garba M, Idi N, Djibril B, Kamayé M, et al.Abruptio placentae. Management in a reference Nigerien maternity.Prospective study about 118 cases during one year. Gynecol Obstet Fertil 2007;35(10):975–981

25. Cheng HT, Wang YC, Lo HC, Su LT, Lin CH, Sung FC, Hsieh CH. Trauma during pregnancy: a population-based analysis of maternal outcome. World J Surg 2012;36:2767-2775.

26. Dahmus MA, Sibai BM. Blunt abdominal trauma: are there predictive factors for abruptio placentae or maternal and foetal distress? Am J Obstet Gynecol 1993;169(4):1054-1059.

27. Morgan K, Arulkumaran S. Antepartum haemorrhage. Current Obstetrics and Gynaecology 2003;13:18-87.

28. Kevin Nandonde. Fetal-maternal outcomes of abruptio placenta at bugando medical centre. A Dissertation submitted in partial fulfillment for the award of Master of Medicine degree in Obstetrics and Gynaecology of the Catholic University of Health and Allied Sciences 2013;1-58

29. Poovathi M., Raji. Prospective follow up study of maternal and foetal outcome in abruption placenta. Int J Reprod Contracept Obstet Gynecol 2016;5(6):1784-1788.

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