Research Article
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Pregnancy evolution, associated complications and perinatal outcome in patients with placenta previa and placental abruption

Introduction

Bleeding from the second half of pregnancy, especially those related to Placenta Previa (PP) and Placental Abruption (PA), occur with an approximate frequency in our population of 1.1%.[1] This frequency is reproduced in health systems that assisted people from different social levels such as for example the German Hospital (medium-high social class) with an incidence of 1.2%.[2] Despite its low incidence, bleeding of pregnancy are associated with significant maternal and neonatal complications.[3–4] The observation our cases allow us to say that cases of PP, have benefited from recent advances in the management of the acute hipovolemias, while PA remains associated with severe maternal and neonatal complications that have not changed over time. The etiology of PA remains unknown, but there are several attributable causes among hypertensive disorders of pregnancy, the umbilical cord briefness, uterine sudden decompression, deficiencies of folic acid, prolonged preterm membranes rupture, polyhydramnios and the former PA in the previous pregnancy.[5] Ananth et al.,[6] conducted a meta-analysis recently and assessed the relationship between PA, prolonged rupture of the membranes and gestational hypertension. They found that the risk of PA is strongly associated with chronic high blood pressure, prolonged membranes rupture and specially the history of PA in a previous pregnancy. The former PA in the previous pregnancy seems to relate intimately with the probability of PA in future pregnancies, increasing the incidence of PA between 10 and 15times.[7] In a cohort study conducted by Kramer et al.,[8] on 36.875 births, relationship was found as etiologic determinants of PA to the following factors: severe intrauterine growth restriction, prolonged rupture of the membranes, chorioamnionitis, both gestational and pre-pregnancy hypertension, smoking, advanced maternal age, single mother and male fetal sex. We conducted a retrospective review of assisted patients at our Hospital in the last 10 years and we selected patients with PA whose medical record allowed us to get information about what happened (n:111), patients with varying degrees of placenta praevia (PP) which also obtain information (n:84) and comparison was made with the general population (PG) hospital assisted during 1996 (n (:7.103). Epidemiological comparisons (maternal age, previous gestations), evaluation of associated maternal pathology, characteristics of the current pregnancy, perinatal outcomes and maternal complications also were made. In the case of PA, patients were selected for evaluation with clear description in the surgical record of presence of PA in different percentage, with compatible clinical signs (uterine hyperton basically with not attributable cause) and with the final pathology report which confirmed the diagnosis. In the case of PP, were selected for evaluation patients with Ultrasonographic diagnosis of PP and compatible clinical evolution, mainly attributable to PP: bleeding episodes. Recently, have been informed a case of PA diagnosed trough the suspicion because of a maternal hemoperitoneum.[9] The patients were treated according to the guide of procedures for each pathology, in the Emergency Department of the Hospital from 1.983.[10,11] With the modifications made to 1.994.[12,13] The statistical evaluation were used in tests of chi square, difference of proportions and Odds ratio.

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Results

Table 1 examines the age of the mothers studied. It shows a lower frequency of adolescents between patients with PP with regard to cases of PA and GP. Half of the patients with PP were 30years or older (Dif proportions P<0.000001 vs GP), this trend also occurs in patients with PA although the difference is less important (Dif. Proportions P<0.0016 vs GP). Table 2 characteristics of the parity of the studied patients are observed. We noticed a slight predominance of multiparity between patients with PP and PA, not significant in the first case (Dif proportions P=0.598) and significant in the case of PA (Dif. Proportions P<0.019). There is a slight increase of the parity between the patients with PA. Table 3 presents the maternal pathologies associated with pregnancy. In the first instance, no differences are observed in the proportion of patients with and without pathology among the groups. Among the patients with PP, the incidence of high blood pressure was lower with respect to GP (3.57% vs 6.84%). There is a clear predominance in the PP group in the presence of hemorrhage (42.85% vs 1.84% chi square P<0.00001) respect to GP, the percentage of patients without prenatal care was higher among patients with PP as in patients of the GP (39.28% vs) (16.06% chi square P<0.0001) and are noted more patients of 35 or more years in the PP Group (32.14%) than in the GP Group (9.72%) Although these differences did not achieve statistical significance (chi square P=0.071). A net prevalence of hypertension incidence is observed between patients with PA (43.24%) with respect to patients with PP and the GP (6.84%) (chi square P<0.00001). Also was seen in the case of PA a high frequency of bleeding associated with respect to GP (39.63% vs 1.84%) (chi square P<0.00001). Among the patients with PA, twice as many patients did not carry out antenatal care with respect to the GP (34.23% vs 16.06%) (chi square P<0.0001) and was also observed increased frequency of patients of 35 or more years but without statistical significance (chi square P=0.071). The Table 4 shows the form of termination of the pregnancy. They ended by Cesarean Section the 98.80% of pregnancies in PP and the 95.49 PA% in comparison with the 20.06% in GP (chi square P<0.0001). Table 5 discusses gestational age at birth by physical examination (Capurro method). The incidence of neonate less than 34weeks was 1.95% in GP, 14.63% in PP and 26.66% PA (chi square P<0.0001).

In Table 6, we see that the average gestational age at diagnosis of PP was 27.07 +-7.25weeks. The 16.17% of the cases, remained as placenta previa having been diagnosed as such prior to 20 weeks of gestational age. As it was to be expected, more than 80% of the cases were diagnosed between 20 and 40weeks. PP type according to their location are discriminated against in Table 7. In total, the 53.33% were of the occlusive type and the 46.66% PP were not occlusive. Table 8 shows that the diagnosis of PA was in a prelabor period in 82% of cases and intrapartum elsewhere (17.1%). The sign most often associated with PA was uterine hypertonia (73%), followed by metrorrhagia (64%), acute fetal distress (51.4%) and maternal hypovolemic shock in 4.6% of cases. In Table 9, the results of the evaluation of the Apgar Score are presented per minute. There is a 12.34% of severe depression associated with PP, which is clearly higher than the 1.59% in GP, but that does not reach statistical significance (chi square P=0.276) and a 38.70% of severe depression associated with PA to if it is significant (chi square P<0.000035). Table 10 analyzes the Score at the fifth minute. The incidence of seriously depressed new born in the GP was 0.45%, 1.23% in PP and PA 16.12% (the difference between proportions P<0.0001). The incidence of very seriously depressed new born was 0.82% GP, pp 1.23% (the difference between proportions P<0.01) and PA 6.45% (difference between proportions P<0.0001). Table 11 examines the weight of the newborn. The incidence of low birth weight newborn in GP was 8.41%, in PP 35.06% (chi square P<0.000001) and PA 44.44% and the incidence of very low birth weight in GP was 6.49%, PP (chi square P<0.000001) and PA 20.63% (chi square P<0.000001). Table 12 allows us to analyze the associated fetal mortality. Late fetal mortality in GP was 0.78%, PP 1.19% (chi square P=0,850) and PA 40.54% (chi square P<0.000001). In Table 13, are exposed the characteristics of PP patients who presented placental acretism requiring postpartum hysterectomy. The presence of placenta praevia total occlusive is common to all patients. Other associated feature was that the 41.66% of patients with PP presented a history of one or more caesarean operations (Table 14) and the 45.23% had a history of one or more abortions (Table 15). In Table 16, is a comparison of features and complications in patients with PA according to the percentage of detachment which consists of the surgical record. It was an arbitrary division between PA<or>50%. Analysis of the data comes from association between PA>50% and fetal death (difference between proportions P<0.003), there is no association between the percentage of detachment and maternal hypertension (Difference between proportions P=0.330), the presence of uterine hypertonia associated with highest percentage of Placental Abruption (difference between proportions P<0.016) as well as the antepartum diagnosis (difference between proportions P<0.00001). The incidence of acute fetal distress was similar between the two groups. The maternal shock and the need for hysterectomy happen only in the cases of more than 50% PA.

Table 1 Maternal age (Years)

Years	PP		PA		G P	
	N	%	N	%	N	%
<20	3	3.57	14	12.61	1.171	16.69
20-29	33	39.28	49	44.14	3.97	56.6
30-35	21	25	31	27.92	1.182	16.85
>35	27	32.14	17	15.31	691	9.85

n: 84 n: n: 111 7.014; PP vs GP: Dif. Proportions P<0.000001; PA vs GP: Dif. Proportions P<0.0016; PP: Placenta previa; PA: Placental Abruption; GP: General population

Table 2 Previous pregnancies

Gestations	PP		PA		GP	
	N	%	N	%	N	%
0	25	29.76	38	34.23	1.993	28.41
1	17	20.23	24	21.62	1.703	24.27
2	13	15.47	9	8.1	1.305	18.6
> =3	29	34.52	40	36.03	2.044	29.13

N: 84 N: N: 111 7.045; Pp Vs Gp: Dif. Proportions P = 0.598; Pa Vs Gp: Dif. Proportions P<0.019.

Table 3 Associated maternal pathology

Pathology	P P		A P		G P		D *
	N	%	N	%	N	%	
With Pathology	17	20.23	34	30.63	1.965	27.66	
Without Pathology =0.558	67	48	77	69.63	5.138	72.33 DNP Vs PG P	
HTA (Total)<0.00001	3	3.57	48	43.24	486	6.84DNP P	
DBT (Total)	5	5.95			349	4.91	
Anemia	4	4.76			138	1.94	
Bleeding	36	42.85	44	39.63	131	1.84	<0.00001
Without PC	33	39.28	38	34.23	1,41	16.06	<0.0001
MA >35Years	27	32.14	17	15.31	691	9.72	0.071

n: 84 n: n: 111 7.103; *Chi square; Hypertension (high blood pressure); DBT (Diabetes); PC (Antenatal care); MA (Maternal age).

Table 4 Way of termination of pregnancy

	P P		PA		G P	
	N	%	N	%	N	%
Spontaneous 0.00001	1	1.19	4	3.6	5.453	76,77<
Forceps			1	0.9	223	3.14
Caesarean Section 0.0001	83	98.8	1.6	95.49	1.425	20.06<
Others					1	0.01

n: 84 n: n: 111 7.102; * Chi square

Table 5 Age gestational to the birth

	(Physical exam. Capurro method)					
	P P		PA		G P	
	N	%	N	%	N	%
< 28	1	1.21	10	9.52	32	0.45
< 30	5	6.09	13	12.38	57	0.8
< 34	12	14,63	28	26.66	138	1.95*
< =34	70	85.36	77	73.33	6.928	98.04*

n: 82 n: n: 105 7.066; * / * Chi square; *<0.0001 p; * P<0.0001

Table 6 Placenta previa gestational age at the diagnosis

Weeks	N	%
< 20	11	16.17
20-30	27	39.7
30-40	29	42.64
> 40	1	1.47

(Weeks LMP) n: 68; Average: 27.07+-7.25weeks

Table 7 Type of placenta previa

Type of P P	N	%
Occlusive total	23	38.33
Occlusive partial	9	15
Marginal	14	23.33
Lateral	14	23.33
Occlusive	32	53.33
Non-Occlusive	28	16.66

n: 60

Table 8 Placental abruption timing and method diagnostics

	N	%
Before delivery	91	82
Intrapartum	19	17.1
Hypertonia	81	73
Metrorrhagia	71	64
SFA	57	51.4
Shock	5	4.6

n: 110; SFA: acute fetal distress

Table 9 Minute apgar score

	P P		PA		G P	
	N	%	N	%	N	%
Mild Dep	12	14.81	11	17.74	242	3.41
Serious Dep*	10	12.34	24	38.7	113	1.59

n: 81 n: n: 62 7.103; *P P vs GP=0.276 Chi square; *PA vs GP<0.000035 or 4.67 (2.10-10.6).

Table 10 The fifth minute Apgar score

	P P		PA		G P	
	N	%	N	%	N	%
Mild Dep	6	7.4	6	9.67	34	0.48
Serious Dep.	1	1.23	10	16.12	32	0.45
Serious Serious Dep	1*	1.23	4	6.45	58	0.82

n: 81 n: n: 62 7.103; *Gestational age 28weeks, weight 1050g; *Gestational age 39-38-26-25weeks, weight 900g, 800g, 2 650g; Serious Dep PA vs GP P<Dif. Proportions 0.0001; Serious Dep. PA vs PG P<Dif. Proportions 0.0001; Serious Dep. PP vs GP P<Dif. Proportions 0.01

Table 11 Weight of the newborn child (Live)

Weight (g)	P P		AP		G P*	
	N	%	N	%	N	%
> 499	77	100	55	87.3	7.017	98.78
<2.500, <0.000001	27	35.06	28	44.44	598	8.41
< 1,500,<0.000001	5	6.49	13	20.63	94	1.32
> 1,000	76	98.7	57	90.47	6.982	98.29

n: 77 n: n: 63 7.103; *Chi square

Table 12 Neonatal fetal morbidity and mortality

	P P		AP		G P*	
	N	%	N	%	N	%
Intermediatefetal mortality			4	3.6	26	0.36
Latefetal mortality*	1	1.19	45	40.54	55	0.78
Malformed			1	0.9	145	2.04

n: 84 n: n: 111 7.103; *P P vs G P vs = 0.850 Chi square; PA vs G P<0.000001 Chi square

Table 13 Characteristics of the patients that presented placental acretism requiring hysterectomy post cesarean section

	Age	Ant. Obst	Type PP	Weight	GANB (week´s)
Case 1	38	5 Births	PPOT	1.850g	33
Case 2	33	3 Births	PPOT	2,800g	37
Case 3	43	2 CS	PPOT	3.630g	38
Case 4	33	4 CS	PPOT	3,000g	36
Case 5	38	4 D 2CS	PPOT	1,860g	34

(n: 84)

Table 14 Frequency of the antecedent of caesarean section in patients with placenta previa

Caesarean Sections	N	%
0	50	59.5
1	22	26.3
2	6	7.1
3	1	1.2
4	5	6

Table 15 Frequency history of abortion patients with placenta previa

Abortions	N	%
0	46	54.8
1	1	25
2	9	10.7
3	3	3.6
4	1	1.2
5	2	2.4
6	2	2.4

(n: 84)

Table 16 Features and complications according to the percentage of placental detachment

	< 5.%		> 50%		P*
	N	%	N	%	
Fetal death	10	24.39	39	55.71	< 0.003
Caesarean section	37	90.24	69	98.57	
Maternal pathology	13	31.7	21	30	
THist	7	17.07	19	27,14	0.33
Hyperton	24	58.53	57	81.42	< 0.016
Antepartum diagnosis	26	63.41	65	92.85	< 0.00001
Metrorrhagia	30	73.17	41	58.57	
Fetal distress	21	51.21	36	51.42	
Shock			3	4.28	
Hysterectomy			3	4.28	
Maternal age	2.61+-7.27		29.83+-6.63		

*Difference between proportions n: 41, n: 70

Discussion

From the epidemiological point of view is seen in our study an association between PA and PP with increased maternal age on the general population, in accordance with recent publications.[6–8] This effect is most noticeable in patients with PP, since more than half of the sample of patients with PP were more than 30years. Also note the small number of patients with PP in the group of patients with less than 20years. Regarding previous pregnancies, the percentage of parity is similar among the groups studied, although there is a slight predominance of the parity among the patients with PA, probably due to the association of PA with gestational hypertension.[5] The multiparity is presented with slight predominance in the PA and PP groups, not being able to establish if this predominance is because of multiparity itself or simply because the multiparity is associated with elderly patients. An important point of the study is the fact that the patients with PA and PP had no prior to pregnancy maternal pathology in greater proportion than the GP, including the group of patients with PP presented maternal pathology percentages lower than the GP. Obviously, there was a significant percentage of patients among the patients with PP with metrorrhagia and between patients with PA is observed a 43.24% of maternal hypertension associated, that is equivalent to a frequency of 7times higher blood pressure which in the GP (P<0.00001). These data suggest that there would not be a certain pathology associated with the presence of PP and is confirmed in coincidence with the literature.[5–8] the strong association of the PA with hypertensive pregnancy diseases. As in most of the disorders associated with pregnancy, absence of antenatal care plays an important role. In this series, the patients with PP and PA presented lack of prenatal care at a rate more than double that of the GP. It is clear that if the patient makes the prenatal consultation, will give the opportunity to make the diagnosis of PP or make a diagnosis of early stage hypertensive, although it is not shown that the measures aimed at controlling high blood pressure during pregnancy reduce the incidence of PA. However, the perinatal outcome of gestational hypertension is clearly superior with patient controlled to uncontrolled. Anyway, despite highlighting the problem repeatedly, we see that the efforts of the medical sector to improve perinatal outcome of high-risk pregnancy, accompany a similar effort on part of those who have the responsibility of organizing health systems.

The majority of pregnancies ended by Cesarean section (98.80% PP and 95.49% PA) compared to the 20.06% in GP (P<0.0001). This is understandable in both situations, but being that the 46.66% of the PP were by non-occlusive, it appears that the presence of vaginal bleeding with ultrasonography diagnosis of PP, had enabled the treating physician to perform a caesarean section, without thinking of for example the ancient Puzos maneuver. It is important in each case to stop and think about which is the indication of the caesarean section, since we are witnessing an increase in obstetric serious pathology, attributable only to the excess of cesarean sections (i.e. placental accretism). Some years ago, the need for a hysterectomy after cesarean section was an exceptional situation in obstetric practice daily. To such an extent that in the Hospital we used to say that intervention is learning to perform later in the residence, acting as a physician on duty learning surgery. Today, is about one of these interventions per month, not always with a good perinatal outcome, neither fetus nor to the mother. Miller et al.,[14] reviewed the cases of placental accretism in a period of 10years. Among the patients with PP, maternal age of 35 or more years and a history of previous cesarean section is one of the most important factors conditioning the appearance of placental accretism risk. The risk of placental accretism ranged between 2% in case of patients less than 35years and no history of caesarean section up to 39% in patients with two or more c-sections. The data of our study coincide with those of Miller regarding the association between PP and maternal age. However, when we look at the cases of placental accretism requiring hysterectomy in the present series of patients, we found that obstetric history of our patients had both births, and cesarean sections being the common factor to all patients the presence of occlusive PP total. The analysis of these five cases shows, however, that all patients were more than 30-year old and multiparous or with at least two caesarean sections configuring so far an important suspicion of probable accretism and a postcesarea hysterectomy requirement

i. Maternal age of 30years or more.

ii. Multiparity.

iii. Caesarean section or previous c-sections.

iv. Placenta praevia occlusive.

Coinciding with the literature.[14] In the present series was observed among patients with PP to the 41.66% had a history of one or more c-sections and the 45.23% had a history of one or more abortions, data also important given that uterine scraping implies a potential myometral injury that could influence an abnormal placenta adhesion. In spite of the new theories about the role of cytoquines and immune modulators in the placental process of implantation.[15] Is important to take in account the presence of previous curettages as a risk factor of abnormal placental adherence to myometrium. Complications relate not only to advanced pregnancies. We have recently reported the presence of placental accretism confirmed by pathology in three patients with diagnosis of egg died and retained, who had a history of at least two previous c-sections in common.[16] Two cases required hysterectomy because a heavy bleeding who presented at the time of the uterine curettage and the third (on the basis of two previous experiences) was treated successfully with methotrexate.[16] It means that we are witnessing pictures really serious, directly or indirectly related to the previous caesarean sections. It should be noted that a detailed assessment ultrasound of the placental insertion site, can induce the suspicion of the advance of the trophoblast of the myometrium, specially when the tiny line between the myiometrium and the bladder is not seen. This information prompted us in the latter case to take a not invasive treatment because the trauma produced by the curettage, that potentially could injure the myometrium and adjacent tissues, in a way that was considered valid to try a treatment non-invasive way. There are anecdotal cases (personal experience not as an operator) where the patients related that in a previous curettage because a miscarriage, the uterus was injured and the injury reached the rectum mucose. In reference to both pathologies of perinatal morbidity, there was an increase of 7 times in the possibility of obtaining a newborn less than 34 weeks in the case of PP and of 13times in the case of PA over the incidence observed in PG. Severe depression in new borns was 6 times higher than in the GP in the case of PP and 24times higher in case of PA. At the fifth minute, severe depression in PP was three times that in GP, while in the case of PA the incidence of major depression was 35 times higher than in GP ($P<0.0001$). The incidence of depressed grave-grave was slightly higher than in the case GP, but it was 8 times higher among the patients with PA ($P<0.0001$). In the case of PP observed a four times higher incidence of newborn of low birth weight with respect to the GP and a 5-fold higher incidence in case of PA ($P<0.000001$). About of a newborn of very low birth weight, in the case of PP the incidence was five times that of the GP and in cases of PA the incidence was 15times greater ($P<0.000001$). Late fetal mortality was slightly higher than GP in PP newborns ($P=0,850$), but patients with PA had a 50times higher incidence ($P<0.000001$). As it can be logically inferred, fetal mortality related to patients with PA the percentage of placenta detached, being twice in cases of removal of more than 50%. However, the presence of uterine hypertonia and diagnosis of Placental Abruption without labor, also related to placental separation more extensive, forming two aggravating factors in the case of Placental Abruption in appearance.

Conclusion

It was observed a low frequency of PP among patients aged less than 20years. More than half of the patients with PP were over 30years old ($P<0.000001$). Association was also observed between maternal age of 30 or more years and PA ($P<0.0016$).

a. A slight predominance of the parity is observed between the patients with PA. Both in patients with PP as with PA, there is a tendency to predominance of the multiparity.

b. Among the patients with PP was noted a high frequency of metrorrhagia, lack of antenatal care and maternal age of 35 or more years. The 41.66% had a history of one or more c-sections and the 45.23% had a history of one or more abortions. All patients who needed a hysterectomy by placental accretism, had placenta praevia total occlusive.

c. Among the patients with PA there is clear prevalence of maternal hypertension (seven times the incidence observed in GP). The absence of prenatal control is also important.

d. The incidence of neonate less than 34weeks was 7times higher in patients with PP and 13times in patients with PA.

e. Severe depression to the fifth minute was double that which presented the GP among patients with PP and 35 times higher among patients with PA ($P<0.0001$). The incidence of depressed newbornas among patients with DP was 8 times higher than the GP.

f. PP patients had four times the incidence of newborn of low weight to the GP and the patients with PA five times. PP patients had five times the incidence of neonate very low weight in comparison with the GP, while patients with PA had raised 15times ($P<0.000001$).

g. The patients with PA presented a 50-fold increase in the incidence of late fetal mortality with respect to the GP ($P<0.000001$).

h. Late fetal mortality, hypertonia and placental detachment antepartum diagnosis was associated with greater than 50% PA, as well as also the maternal shock and the need for hysterectomy.

The presence of the following factors constitute elements of risk of hysterectomy in patients with placenta previa:

i. Maternal age of 30 or more years.

ii. Multiparity.

iii. History of Cesarean section or previous c-sections.

iv. Presence of occlusive total placenta.

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Conflict of interest

The author declares no conflict of interest.

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