

Placenta previa in a referral hospital in Oman

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ABSTRACT

Objectives: To determine the incidence of placenta previa associated pregnancies, to find out the strength of association of identified risk factors with the major placenta previa associated pregnancies and to identify predictors for preterm outcome.

Methods: Records of women with placenta previa, who delivered at Nizwa Hospital, Al-Dakhliya region, Sultanate of Oman between October 1998 and September 2002, were analyzed retrospectively utilizing a case control approach.

Results: An incidence of 0.6% for placenta previa was noted in our study. Nearly two thirds (64.8%) of the pregnancies resulted in antepartum bleeding. Pregnancies with major placenta previa constituted 72% of all the subjects. Higher parity (5), maternal age (30) and history of previous abortion had high odds of association with major placenta previa of 2.1, 2.4 and 2.5.

Antepartum hemorrhage was not significantly associated with pregnancies presenting with major placenta previa (odds ratio [OR] 1.3; $p > 0.05$). The proportion of preterm deliveries was 55.5% in the study. There was a significant association between preterm outcome and presence of antepartum hemorrhage (OR 10.8; $p < 0.001$).

Conclusion: In spite of higher maternal age, parity and previous abortions having high odds of presenting in pregnancies with major placenta previa, no significant statistical association could be proven. Also, no significant difference among pregnancies presenting with major or minor placenta previa as regards the preterm outcome, could be established. Antepartum hemorrhage, irrespective of severity, was a strong predictor of preterm outcome.

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Insertion of the placenta either partially or wholly into the lower uterine segment, defined as placenta previa, has an approximate incidence of 0.5% of all pregnancies.¹ In the confidential inquiries into maternal deaths in the United Kingdom during 1994 to 1996, 50% of maternal deaths due to hemorrhage were related to abruption placenta and placenta previa.² The potential maternal, neonatal morbidity and mortality associated with this condition is therefore of concern to obstetricians. The association between placenta previa and previous cesarean sections (CS), multiparity, multiple pregnancy and higher maternal age has been documented by various authors.^{3,4} Women with placenta previa are at an increased risk of

antepartum hemorrhage and preterm delivery,⁵ the perinatal outcome is poorer and morbidity is increased.⁶ Higher age groups and those with parity of ≥ 5 (28.9%) constitute a high proportion of pregnant women in Oman.⁷ A high proportion of pregnant women (31.8%) are in the age group of 30-39 and another 10.1% belong to even a higher age group of 40-49.⁸ In view of the facts, we undertook a study to (i) find out the incidence of placenta previa associated pregnancies (ii) assess strength of association of identified risk factors with major versus minor placenta previa associated pregnancies and (iii) identify predictors for preterm outcome.

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Methods. All the relevant information pertaining to the study was collected from the records of pregnant women with placenta previa who registered from October 1998 to September 2002 in Obstetric Unit of Nizwa Hospital, Al-Dakhliya region, Oman. The hospital is the apex referral center for all high-risk cases in the region. Placenta previa was diagnosed by ultrasonography and graded into 4 types in the ascending order of severity with major placenta previa implying placenta covering the internal cervical os either partially or completely. Any severe vaginal bleeding at any gestational age or considered to be detrimental to mother's well being was the indication for intervention for delivery. Risk factors such as higher maternal age, high gravidity and parity, previous abortion, stillbirth, preterm delivery, dilatation curettage, CS, myomectomy or hysterotomy were considered as their association with incidence of placenta previa in the current pregnancy.

The statistical association was determined making use of Epi info statistical software, modalities of odds ratio (OR) with 95% confidence interval (CI) limits, Chi square test and Fisher's exact test and making use of unpaired t-test to perform comparison of continuous variables with a normal distribution. Statistical association was inferred to be significant at a probability determined to be <0.05 on 2-tailed analysis.

To determine the association of identified risk factors with incidence of major versus minor placenta previa, the subjects were divided into the 2 groups as cases and controls. This case control approach was utilized for statistical estimation and inference. Likewise, for prediction of preterm outcome, association of independent variables such as presence of major placenta previa, antepartum hemorrhage and its amount were assessed, utilizing the case control design. The case group comprised of preterm namely delivery at <37 weeks gestation and controls constituted term namely delivery at ≥ 37 weeks gestation. In terms of assessing the amount of antepartum bleeding (APH) as a predictor for preterm, subjects were categorized in 2 groups: 1) APH of >500 ml and 2) APH of <500 ml.

Results. Out of 9007 pregnant women who delivered between October 1998 and September 2002, 58 women had placenta previa with an incidence of 0.6% over a period of 4 years. Four women were excluded from the study due to twin pregnancy and ineligible records. Placenta previa major was present in 39 of the pregnancies (72.2%). An overall mean age of 30.6 ± 5.9 years was observed in the study with an overall gravidity of 6.3 ± 3.5 and parity of 4.7 ± 3.1 . Women aged ≥ 30 years and those with parity of ≥ 5 each constituted

55.6% of all the currently pregnant women in the study. The proportion of the pregnant women in the maternal age group of 20-29 years was 44.4% (**Table 1**). Patients presented with mean gestational age of 30.5 ± 5.9 weeks at diagnosis and mean gestational age of 35 ± 3.4 weeks at delivery. The mean days of hospitalization of the women in the study were 9.7 ± 12.6 days with a median hospitalization of 4 days. Among the 54 pregnant women in the study, 35 patients (64.8%) had bleeding during the pregnancy with 9 of them having bleeding amount of ≥ 500 ml. Only 4 patients developed severe intractable bleeding, of whom 2 had hysterectomy, one had uterine artery ligation, and the remaining one developed pulmonary embolism, which was treated conservatively. Of the total 54 patients, 51 delivered by CS (94.4%) and 3 had normal vaginal delivery (5.5%). Of those who delivered by CS more than two-thirds (36 patients) had emergency CS, with elective CS in the remaining 15 patients (29.4%). Of all the 54 pregnant women, 30 pregnancies (55.5%) resulted in preterm outcome. An overall mean birth weight of 2.47 ± 0.7 kgs was recorded in the study. Those having antepartum hemorrhage and preterm delivery had a mean birth weight of 1.8 kgs. There were a total of 6 stillbirth/neonatal deaths in the study. Previous pregnancy related risk factors for placenta previa were present in a total of 32 pregnant women (59.2%) of whom 18 (56.2%) had previous abortion, 8 (25%) had previous CS, 4 (12.5%) had preterm delivery and 2 (6.2%) having undergone myomectomy/hysterotomy. The odds (chances) of pregnancy presenting with major placenta previa

Table 1 - Characteristics of pregnant women.

Characteristics	Frequency	(%)
Age (years)		
20-29	24	(44.4)
30-39	27	(50)
≥ 40	03	(5.6)
Gravidity		
1-4	15	(28)
5-8	24	(44)
≥ 9	15	(28)
Parity		
0	6	(11.1)
1-4	18	(33.3)
5-8	23	(42.6)
≥ 9	7	(13)
Major placenta previa	39	(72.2)
Antepartum hemorrhage	35	(64.8)
Preterm deliveries	30	(55.5)

Table 2 - Association of risk factors with major placenta previa.

Characteristic	Major PP (Present)	Major PP (Absent)	Odds ratio (CI)	p value (Mantel Haenszel)
Age ≥ 30 years	24	6	2.4 (0.6, 9.6)	$p=0.15$ (NS)
Gravidity ≥ 5	29	10	1.4 (0.3, 6.1)	$p=0.57$ (NS)
Parity ≥ 5	23	6	2.1 (0.5, 8.6)	$p=0.21$ (NS)
Previous abortion	15	3	2.5 (0.5, 15.8)	$p=0.20$ (NS)
Previous CS	6	2	1.1 (0.1, 13.4)	$p=0.85$ (NS)
Previous Preterm	4	0	F test $p=0.5$	$p=0.2$ (NS)

CI - confidence interval, CS - cesarean section, NS - non significant, PP - placenta previa

versus minor placenta previa variety was higher in those patients who had the above mentioned risk factors related to earlier pregnancies, maternal age of ≥ 30 years and gravidity or parity of ≥ 5 (Table 2). However, in spite of high OR, the probability of association inferred was not statistically significant ($p>0.05$). The likelihood of antepartum hemorrhage was independent of the pregnancy being associated with major or minor placenta previa (OR 1.3, $p>0.05$). In pregnancies associated with major placenta previa, the odds estimated for having preterm outcome were higher (OR 2.4) but the association was not inferred to be significant ($p>0.05$). However, presence of antepartum hemorrhage significantly predicted preterm outcome (OR 11, $p<0.001$). The higher amounts of bleeding of 500 ml could not be substantiated as a predictor for preterm outcome (OR 1.7, $p>0.05$).

DISCUSSION. The proportion of placenta previa among the delivered in our study correlated well with the prevalence as variously reported as 1:150 to 1:600 deliveries by Brenner et al¹⁰ and 1:255 by Rose and Chapman.³ Recent studies of Love and Wallace¹ and Archibong and Ahmed⁴ have identified as 0.6% of women with placenta previa among all the deliveries conducted during their study period, which is identical to our results. Pregnancies among higher age groups and in those with higher parity constituted a significant proportion in this study. In the last decade, deliveries by CS have steadily increased in Oman to a level of 10.2% during the year 2002,⁷ with a total fertility rate of 4.8.⁸ Archibong and Ahmed⁴ in their prospective study of risk factors in major

placenta previa concluded that a direct association existed between the incidence of placenta previa and increased maternal age, parity and previous CS. Archibong and Ahmed⁴ had a high proportion of their subjects with previous CS (53.5%). Rose and Chapman³ found a lack of association between termination of pregnancy and placenta previa but they found a significant correlation existed between placenta previa and a previous spontaneous abortion. Although we had an adequate sample size for analysis (>30) yet considering the fact that the results should have a validity, the OR estimated were inferred further by the p value for statistical significance. Although higher odds of placenta previa major were being associated with a history of previous abortion, age of ≥ 30 years and parity of ≥ 5 , yet the inference was insignificant ($p>0.05$) in our study. Brenner et al¹⁰ reported in their study that approximately 40% of women with placenta previa experienced premature rupture of membranes, spontaneous labor and other problems that resulted in delivery before 37 weeks gestation. We had a proportion of 55.5% of preterm in our study with delivery by CS in nearly 95% of the subjects. Love and Wallace¹ reported an emergency CS to be more common in women with bleeding (62% versus 38%). Wing et al¹¹ performed a similar high rate of expeditious cesarean deliveries in those with recurrent bleeding episodes and had an average of 28.6 ± 20.3 days of hospitalization for in patients. The days of hospitalization for our study patients were lower (median - 4 days) as a result of fewer complications. Expectant management on the lines recommended by Silver et al¹² which envisaged maintenance of pregnancy until fetal maturity including liberal blood replacement under 24 hours obstetric and anesthesia coverage, yielded a favorable outcome resulting in only one stillbirths and 5 neonatal deaths (one stillbirth had hydrocephalus and 5 neonatal deaths were due to extreme prematurity). All the 6 fetal deaths were of those pregnancies having APH and gestational age of the fetus <37 weeks, one out of the 6 deaths having congenital anomaly. Cotton et al¹³ in their study on conservative aggressive management of placenta previa reported higher rates of pregnancy losses namely 6.3% stillborns, 6.3% neonatal deaths with one set of twins contributing to 2 of the total 11 deaths. McShane et al¹⁴ in their study on maternal and perinatal morbidity resulting from placenta previa reported a low (4.1%) proportion of all babies having a birth weight to mean appropriate weight for gestational age ratio of <0.75 . In our study, we found an overall mean birth weight of 2.47 kgs among all the newborns, more than half of them being preterm. Special Care Baby Unit (SCBU) admission was indicated in nearly three fourths of the newborn babies (74.3%) with

majority of the admissions (74.3%) being for a period of <10 days.

Predictors. Preterm outcome. Placenta previa major was neither predictive of APH (OR 1.3; CI 0.3, 5.3) nor of preterm outcome (OR 2.4; CI 0.6, 9.6). Approximately two-third pregnant women of both categories of placenta previa had a major and minor antepartum hemorrhage. Thus, the probability of observing antepartum hemorrhage in case of placenta previa major ($p=0.64$) has no significant compared to placenta previa minor ($p>0.05$). This is similar to the finding by Love and Wallace¹ who observed that the degree of previa was not predictive of the likelihood of bleeding. Similarly, proportion of preterm deliveries was identical 61.5% and 66.6% among those with placenta previa major and minor ($p=0.15$), which is statistically insignificant. Antepartum hemorrhage, however, was a strong predictor of preterm delivery (OR 10.8; CI 2.4, 54). The proportion of preterm outcome was very high (86.6%) among those having antepartum hemorrhage, which was highly significant compared to those without antepartum hemorrhage ($p<0.001$). In their study, Brenner et al¹⁰ recorded a high proportion of women with placenta previa having experienced hemorrhage and resulting in preterm delivery (approximately 40%). Our study had a proportion of 55.5% preterm deliveries out of which 86.6% had antepartum hemorrhage. Women with placenta previa without antepartum hemorrhage did not appear to have an increased risk of preterm delivery in the study conducted by Lam and Wong.⁵ A significant finding was that in spite of APH being definitely associated with preterm outcome, the increased volume of bleeding of ≥ 500 ml had no linear association with the preterm outcome (OR 1.7; $p>0.05$).

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