Relationship Between Normally Implanted Placenta And Estimated Post-Partum Blood Loss

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Abstract
This was a retrospective study aimed at determining any association between normally implanted placental sites and estimated post-partum blood loss (PPBL).
The case records of 400 deliveries between January 1996 and June 1998 of patients who registered for antenatal care at the University of Ilorin Teaching Hospital, Maternity Wing and who had ultrasound examination between 28 and 40 weeks of the antenatal period. All patients were actively managed during the third stage of labour and the placenta delivered by controlled cord traction. Exclusion criteria include genital laceration, bleeding dyscrasias and cases diagnosed as placenta praevia.
Analysis was made in relation to age, parity and estimated blood loss during labour, site of placenta on antenatal sonography and its weight. One hundred and sixty eight (42%) of the patients were aged between 26 and 30 years and there was no significant difference in the mean blood loss for age, P=0.76. The common sites of the placenta on the uterus were Anterior, One hundred ninety five (48.75%) and Posterior. One hundred and sixty six (41.65%) respectively. Also, there was no significant difference in the estimated PPBL and placental site, P=0.05. One hundred and fourteen (28.6%) were primiparous and thirty eight (9.5%) were grandmultiparous. Although Para 4 patients had the highest mean PPBL (300ml), there was no significant difference between parity and mean PPBL, P=0.05. In conclusion, there is no significant relationship between normal placental sites and estimated PPBL, in actively managed labour or deliveries.

Keywords: Post-Partum Blood loss, Placental Sites.

Resume
Cet etude est retrospective qui a pour l’objectif de determiner par la relation entre les placentas normalement implanté et l’hémorragie post-partum les dossiers de 400 accouchements qui ont sié pendant le 3eme trimestre de gestation ont été analysé. Les malades sont traité activement dans le troisieme etage d’accouchement et le placenta delivre maladies par le tir contre contrôle:
Les critères d’exclusion inclus la laceration génitale, les dyscrasies hémorragiques, et les analyses ont été faire en relation de l’age, la parité, la perte du sang estimée pendant l’accouchement, la localisation du placenta en sonographie anténatale et son poids. Le pourcentage des maladies sont agées de 26 ans et 30 ans et il n’y pas de différence significatif en cas de perte sanguine moyenne pour l’age p=0.76. Le concentration du placenta plus commode est antérieure, 195(48.75%), et postérieure 166(41.65%) respectivement. Aussi, il n’ya pas de différence significatif en PPBL estimé et la localisation du placenta p=0.05. 114(28.6%) sont primipare, et 38(9.5%) sont multipare.
Même si les malade du paragraphe 4 ont la moyenne plus élevée PPBL(300ml) il n’y pas de différence significatif entre la parité et la moyenne PPBL p=0.05. En conclusion, il n’ya pas de rapport significatif entre la localisation normale du placenta le PPBL estimée chez des incidents traités activement pendant l’accouchement.

Introduction
Every year 585,000 women die from complications of pregnancy and child-birth. The majority of these deaths, almost 99% occur in developing countries and less than 1% in the developed world. These deaths are preventable in the majority of cases and have devastating social and economic consequences for families, particularly children and communities at large.

One of the commonest causes of maternal mortality is obstetric haemorrhage. Globally, it is responsible for 25% of maternal mortality. In the developing countries, it is a very common cause of maternal mortality. In a twelve-year analysis of mortalities in Ilorin, Nigeria, obstetric haemorrhage was the most common cause of maternal mortality, accounting for 35.5% of all maternal deaths. One of the postpartum haemorrhage (PPH) being responsible for 33.3% of these deaths.

PPH is defined as blood loss in excess of 500ml within the 24hrs of delivery.

Causes of postpartum haemorrhage include atomic uterus from various causes, genital laceration, coagulation defects and blood dyscrasias. What determines the site of placenta are unknown and the relationship, if any between normally implanted placenta and postpartum blood loss is not documented in the literature. However it has...
been proposed that past Caeasarian Section scar tissue can serve as a nidus for placental implantation.

Therefore the objective of this study is to determine the non-prefeia site associated with the highest mean estimated postpartum blood loss (PPBL); determine any significant correlation between these normal placental sites and estimated blood loss and determine whether ultrasound will be useful in predicting patients who are likely to have excess PPBL or PPB.

**Materials and Methods**

The case records of deliveries between January 1996 and June 1998 of patients who registered for antenatal care at the University of Ilorin Teaching hospital, Nigeria and who had ultrasonographic examination during the antenatal period at gestational age between 28-40 weeks were examined. Sonographically, we were mindful of the fact that the placenta may develop in any region of the uterus. It is of clinical importance if it encroaches on the lower segment. The placenta is most clearly demonstrated when it is attached to the fundus of the uterus or to the anterior wall. A laterally implanted placenta frequently extends well round the uterus, giving rise to the appearance of placenta tissue on the anterior and posterior walls as seen on the longitudinal scan. The posteriorly sited placenta may be partially obscured by the fetus particularly in late pregnancy and its position may be inferred initially by its absence elsewhere. Its presence or absence may also be confirmed by scanning obliquely in order to get it visualized behind the image of the fetus. The possibility of placenta praevia, if present, was determined based on 3 anatomical references or points:

(a) The limit of the lower margin of the placenta.
(b) Extent of the lower segment (usually about 5cm from the internal os during pregnancy).
(c) Position of the internal os relative to the placental image.

A firm diagnosis of placenta praevia was not made before 32 weeks, as a changing relationship of margin of the placenta to the internal os of the cervix has been noted prior to this time, due to placental migration.

All patients had active management of the third stage of labour and placenta were delivered by controlled cord traction (CCT) and were said to be complete when examined. Blood loss was estimated by a combination of direct measurement into a calibrated jar and by suctioning all available pockets of blood collections at the delivery.

Analysis was made in relation to age; parity; estimated blood loss during labour; site of placenta on prenatal sonogram; presentation; lie and amniotic fluid volume or contents; occupation; weight and height of the mother; birth weight of the baby, length, head circumference as well as the placental weight.

During the period under study, 500 case files of patients who had antenatal abdominal ultrasonography were retrieved, however only 100 of them had complete clinical information and they formed the subjects of results and discussion.

All patients who had placenta praevia, abruptio placenta, previous uterine scar, genital lacerations, and clinical evidence of bleeding disorders were excluded from the study.

It should be noted that ultrasonography is not done routinely during antenatal period in this hospital. It is done when indicated.

**Results**

The age distribution of the patients studied is shown in Table 1. Twenty five patients (6.3%) were aged between 16 and 20 years, while twenty (5%) were aged between 36 and 40 years. The commonest age group was between 26-30 years, accounting for one hundred and sixty eight (42.1%) of the cases. There was no significant difference in the mean blood loss for age, (r=0.76).

The site of placenta and mean PPBL are shown in Table 2. There is no significant difference in the site of

**Table 1: Mean Post-partum Blood loss and the distribution of patients by Age.**

<table>
<thead>
<tr>
<th>Age group (Yrs)</th>
<th>Frequency</th>
<th>(%)</th>
<th>Mean PPBL for Age (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-20</td>
<td>25</td>
<td>6.25</td>
<td>206.8±4.794</td>
</tr>
<tr>
<td>21-25</td>
<td>95</td>
<td>23.0</td>
<td>246.6±4.794</td>
</tr>
<tr>
<td>26-30</td>
<td>168</td>
<td>42.0</td>
<td>283.7±4.794</td>
</tr>
<tr>
<td>31-35</td>
<td>94</td>
<td>23.5</td>
<td>220.7±4.794</td>
</tr>
<tr>
<td>36-40</td>
<td>20</td>
<td>5.0</td>
<td>250.0±4.794</td>
</tr>
</tbody>
</table>

X² = 1.97
P-value = 0.76

**Table 2: Ultrasound Diagnosed placental sites and mean post-partum blood loss.**

<table>
<thead>
<tr>
<th>Placental site</th>
<th>Frequency</th>
<th>(%)</th>
<th>Mean PPBL for Age (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior</td>
<td>194</td>
<td>48.5</td>
<td>232.8±4.94</td>
</tr>
<tr>
<td>Posterior</td>
<td>165</td>
<td>41.25</td>
<td>237.4±4.94</td>
</tr>
<tr>
<td>Fundal</td>
<td>35</td>
<td>8.75</td>
<td>243.9±4.94</td>
</tr>
<tr>
<td>Lateral</td>
<td>6</td>
<td>1.5</td>
<td>250.4±4.94</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

X² = 0.74
P-value = 0.99

Key: PPBL=Post-partum blood loss
Table 3: Common placental sites (predominant placental sites) and estimated blood loss.

<table>
<thead>
<tr>
<th>EBL (ml)</th>
<th>Anterior</th>
<th>Posterior</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-200</td>
<td>99</td>
<td>102</td>
<td>201</td>
</tr>
<tr>
<td>201-300</td>
<td>71</td>
<td>42</td>
<td>113</td>
</tr>
<tr>
<td>300-400</td>
<td>10</td>
<td>12</td>
<td>22</td>
</tr>
<tr>
<td>401-500</td>
<td>11</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>501-600</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>601-700</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>701-800</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>801-900</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>&gt; 900</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>194</td>
<td>165</td>
<td>359</td>
</tr>
</tbody>
</table>

P-value = 0.86
Key: EBL Estimated blood loss

Table 4: Mean Post-partum blood loss and the distribution of patients by parity.

<table>
<thead>
<tr>
<th>Parity</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Mean PPBL (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>114</td>
<td>28.5</td>
<td>240.3±4.794</td>
</tr>
<tr>
<td>2</td>
<td>94</td>
<td>23.5</td>
<td>256.9±4.794</td>
</tr>
<tr>
<td>3</td>
<td>92</td>
<td>23.0</td>
<td>219.7±4.794</td>
</tr>
<tr>
<td>4</td>
<td>40</td>
<td>10</td>
<td>229.2±4.794</td>
</tr>
<tr>
<td>5</td>
<td>30</td>
<td>7.5</td>
<td>300.0±4.794</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
<td>3.5</td>
<td>177.3±4.794</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
<td>2.5</td>
<td>150±4.794</td>
</tr>
<tr>
<td>Others &gt; 7</td>
<td>6</td>
<td>1.5</td>
<td>167.4±4.794</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

P-value = 0.56; Others > 7;
Key: PBL Post-partum blood loss

placenta and PPBL, r = 0.74. The commonest site of placental implantation was anterior location in one hundred and ninety four (48.5%), and least is lateral in six (1.5%) of cases.

A further analysis of the common placental sites (anterior and posterior) and the estimated blood loss is shown in Table 3. One hundred and forty-four (36.1%) and one hundred and twenty-five (25%) of patients with anterior and posterior placenta respectively lost between 201 and 300mls. of blood at delivery, while 3 and 6 patients with anterior and posterior placental location had PPBL. There was no significant difference between the site of placenta and estimated blood loss, (r=0.86).

Table 4 shows the parity and mean PPBL. Primipara one hundred and fourteen (28.6%), had a mean PPBL of 240.3mls while para 5, thirty five (8.7%) had mean blood loss of 177.3ml. Patients who are of parity 4 had the highest (300ml) of mean PPBL. However, there is no significant difference between parity and mean PPBL, (r=0.56).

Discussion

Blood loss during delivery is inevitable, as the placenta separates from the myometrium with opening up of the vessels at the placental site. The effective and efficient contraction of the myometrium usually brings about the arrest of the haemorrhage. However, improper separation and expulsion of placenta are often accompanied by profuse bleeding, the placenta being relatively non-contractile and has only limited ability to alter its size and shape to compensate for changes in the area of the uterine wall over which it is attached. It is therefore sheared off as the uterus contracts during the expulsion of the fetus. The completeness with which the placenta is separated is determined by how much the sub placenta area of the uterine wall is reduced. 1

The third stage, the interval between the delivery of the infant and the delivery of the placenta, is the most dangerous part of the entire labour.

This danger is more heightened sometimes, because various methods are employed traditionally to provoke bleeding at delivery as this occasionally is erroneously regarded in some African countries as a mean for the body to get rid of “excess” fluid accumulated in pregnancy. 16

Abnormality of placental site separation and expulsion may be accompanied by profuse bleeding. Placenta praevia, abruptio placenta and abnormally adherent placentas are usually associated with postpartum haemorrhage. However the average blood loss for other sites of placenta, such as the fundus, anterior, posterior and body of the uterus which are termed normal are not known or documented in regard to labour.

Blood loss during the third stage varies considerably. Newton reported the average measured blood loss during the first 24hrs after vaginal delivery to be about 650mls. 9

Pritchard and colleagues reported a similar figure and also observed that 5% of women who delivered vaginally lost more than 1000ml of blood. 18

Leland measured a blood volume loss of 610ml, 60 minutes after vaginal delivery. The highest measurements of blood loss are those of Quilivan and Brock 19, who calculated the decrease in blood volume after delivery to be 1115 and 1023, by the two methods. This corresponded to their measured loss of 1106ml.

The WHO definition of blood loss is generally adopted in many countries 11. But obviously, from the studies in which blood loss was measured accurately, rather than estimated, 500ml is far too low a figure to accept as the upper limit of normal blood loss. It may be as high as 1000ml. 9

The present study has shown that the mean esti-
mated Blood Loss (EBL) of all the patients who had USS during the antenatal period is 235.9mls with a standard Deviation of 130.1. As a future study, it might be interest- ing to see if there are clinical symptoms or abnormalities in the blood indices of patients with estimated post-partum blood loss greater than this mean value or specifically above 250mls, in view of the preponderance of these estimates among the samples studied. This we hope may necessitate a re-definition of the WHO value for PPH, in under developed countries.

In other words, for a developing country with poor socio-economic factors, PPBL greater than 250ml will hopefully alert the attending obstetrician to pay a closer attention, so that further blood loss may be prevented, to avoid deterioration in patient’s condition.

There is no significant correlation of PPBL and age, in the present study. We realized that some of the blood losses in the younger age groups may be due to birth lacerations and bruises along the birth canal during labour or deliveries because of their untried birth canals. Safari et al. have been able to demonstrate that blood loss during vaginal delivery with episiotomy may even be greater than losses during caesarean section.

Majority of patients studied were within the 26-30 age groups and these are the highly reproductive (ferile) age groups. Also, it is noteworthy that no correlation is demonstrated between the parity of the patients and the PPBL, contrary to traditionally held view. This may be due partly to active management of the third stage of labour.

In line with the objective of the study, it is shown that most of the placental sites are in the anterior and posteri or walls respectively. No significant correlation is demonstrated between the estimated blood loss and the placental sites, but this presumably will not preclude the possibility of relationship between PPBL and normal placental sites, since the influence of active management of the stage is not eliminated from the study.

In conclusion, this study demonstrated no significant relationship between the placental site and PPBL.

However, we hope in future to examine cases of confirmed PPH at delivery and retrospectively assess the placental site in the antenatal ultrasound reports, thus minimizing or entirely eliminating the effect of active management of labour on PPBL. This approach is only feasible if ultrasound examination is accepted as a routine antenatal test.

Also the possibility of making use of ultrasound to predict the patients who are likely to have excess PPBL or PPH will definitely improve the prognosis of cases with PPH, since it is observed that the mortality rate in PPH depends upon the amount and rapidity of blood loss, the patient’s general health and the speed and adequacy of treatment, as well as preventive measures taken before its onset.

References

17. Herbert WNP, Cefalo RC: Management of post-
