ANTENATAL CLINICAL PELVIMETRY IN PRIMIGRAVIDAE AND OUTCOME OF LABOUR

S. T. Sule and B. I. Matawal

Department of Obstetrics and Gynaecology, Ahmadu Bello University Teaching Hospital, Zaria, Nigeria

Reprint requests to: Dr. S. T. Sule, Department of Obstetrics and Gynaecology, Ahmadu Bello University Teaching Hospital, Zaria, Nigeria. E-mail: saasule@yahoo.com

Key words: Pelvimetry, primigravidae, outcome of labour

Abstract

Background/Objectives: To determine the relationship between antenatal clinical pelvimetry and the outcome of labour in primigravidae in order to assess the importance of the procedure.

Method: A retrospective study of clinical pelvimetry and outcome of labour in primigravidae.

Results: The total number of primigravidae included in the study was 268 and of these, 74 were adjudged to have adequate pelvis at antenatal clinical pelvimetry. The APGAR scores at one and five minutes were significantly higher among infants born to mothers who had clinically adequate pelvis at antenatal assessment compared to the APGAR scores of infants born to mothers who did not have antenatal clinical pelvimetry but this association became insignificant after controlling for booking status. Infants born to booked mothers had significantly higher APGAR scores than those who were not booked ($\chi^2 = 36.52, p = <0.001$ and $\chi^2 = 28.67, p = <0.001$ for one and five minutes respectively). There was no significant association between antenatal clinical pelvimetry and duration of labour after admission or mode of delivery even after controlling for gestational age and birth weight.

Conclusion: Antenatal clinical pelvimetry may have predictive value for foetal outcome and should be encouraged in all primigravidae in this environment where adequate foetal monitoring facilities are not widely available. Antenatal care has a positive effect on foetal outcome and should be encouraged in all pregnant women.

Mots clés: Pelvimétrie, primigeste, résultats du travail

Résumé

Contexte/Objectifs: Déterminer la relation entre la pelvimétrie clinique anténatale de la primigeste et les résultats du travail dans le but d’apprécier l’importance d’un tel examen.

Méthodes : Une étude rétrospective de la pelvimétrie clinique et les résultats du travail chez des primigestes.

Résultats : Le nombre total de primigestes incluses dans cette étude était de 268, parmi lesquelles, 74 avaient un pelvis adéquat à la pelvimétrie anténatale. Les scores APGAR à 1 minute et 5 minutes étaient significativement plus élevés chez les enfants de mères ayant un pelvis adéquat à la pelvimétrie anténatale comparés à ceux d’enfants issus de mères n’ayant pas bénéficiées de pelvimétrie anténatale, mais cette association devenait insignifiante après le contrôle des rendez-vous. Les enfants nés de mères ayant des rendez-vous réguliers avaient un score APGAR significativement plus élevé que leurs homologues de mères non suivies ($\chi^2 = 36.52, p = <0.001$ et $\chi^2 = 28.67, p = <0.001$ pour 1 minute et 5 minutes respectivement). Il n’y avait pas d’association significative entre la pelvimétrie clinique anténatale et la durée du travail après admission ou le mode d’accouchement même après contrôle de l’âge gestationnel et du poids de naissance.

Conclusion: La pelvimétrie clinique anténatale peut avoir une valeur prédictive sur l’état du foetus et devrait être encouragée chez toutes les
primigestes dans les milieux où les moyens adaptés de monitoring fœtal sont largement disponibles. La prise en charge anténatale à un effet positif sur l’état du fœtus et devrait être encouragée chez toutes les femmes enceintes.

Introduction

Clinical pelvimetry refers to the assessment of the pelvic size by clinical examination with a view to predicting mode of delivery. It may be performed in the antenatal period or during labour. In recent times, other more accurate and relatively safe methods of pelvimetry such as, ultrasonography, computerised tomography scanning and magnetic resonance imaging have become available but these are expensive and not widely available in developing countries like Nigeria. X-ray pelvimetry, which is widely available in such countries and less expensive, is rarely used nowadays because of the foetal exposure to radiation. Clinical pelvimetry, which is inexpensive, has been shown to be a reliable method of assessing the pelvic capacity, and is of predictive value for the foetal outcome in primigravidae.

In Ahmadu Bello University Teaching Hospital where this study was carried out, the policy is for routine clinical pelvimetry at term for all booked primigravidae. The aim of this study was to determine the usefulness of this practice with regards to the labour outcome. The specific objectives of the study were to compare the intrapartum blood loss, duration of labour, mode of delivery and APGAR scores of the infant among primigravidae who had antenatal pelvimetry and those who did not.

Materials and Methods

The setting was the delivery suite of Ahmadu Bello University Teaching Hospital, Zaria and the subjects were all primigravidae who delivered in the unit between January 1, 2001 and December 31, 2001. Multiple births, non-cephalic presentations, pre-term and post-term births were excluded from the analyses to minimise bias. The case notes of all eligible parturients were retrieved and details about their booking status, antenatal period and delivery were obtained and analysed using MINITAB statistical software.

Results

The total number of primigravidae included in the study was 268 and of these, 135 (52.12%) were booked in Ahmadu Bello University Teaching Hospital, Zaria, 70 (27.03%) were booked elsewhere, 47 (18.15%) were not booked anywhere, and 7 (2.70%) were registered in this centre but did not attend the clinic more than 2 times. The booking status was not stated in the case notes of 9 parturients. Seventy-four of the parturients were adjudged to have adequate pelvis at antenatal clinical pelvimetry. Only 3 were adjudged to have borderline pelvis and one was adjudged to have contracted pelvis – these numbers were too few for any meaningful analyses. The comparisons were therefore carried out between those who were adjudged to have adequate pelvis antenatal and those who did not have antenatal clinical pelvimetry.

Table 1 shows the details of some labour parameters in the two groups of parturients. There was no significant association between antenatal clinical pelvimetry and duration of labour after admission even after controlling for gestational age and birth weight.

The proportion of infants that had one-minute APGAR scores of 8 or more was significantly higher among parturients whose pelvis were adjudged to be adequate during the antenatal period (91.67%) compared to parturients who did not have antenatal clinical pelvimetry (69.09%), $\chi^2 = 13.29$, $p = 0.004$. Similarly, a significantly higher proportion had five-minute APGAR scores of 8 or more among those whose pelvis were adjudged to be adequate in the antenatal period (96.67%) compared to those who did not have antenatal clinical pelvimetry (78.79%), $\chi^2 = 11.07$, $p = 0.011$. However, this association became insignificant after controlling for parity – among the booked parturients, there was no significant association between clinically adequate pelvis in the antenatal period and one and five minute APGAR scores ($\chi^2 = 0.091$, $p = 0.99$ and $\chi^2 = 0.043$, $p = 1$ for one and five minutes respectively).

The proportion of infants that had one-minute APGAR scores of ≥8 varied significantly depending on the booking status ($\chi^2 = 36.52$, $p = <0.001$) being highest in the booked parturients (85.40%), followed by those that were booked elsewhere (66.67%) then the registered (57.14%) and the unbooked (57.14%). Similarly, the proportion of infants that had 5-minute APGAR scores of ≥8 was significantly different depending on the booking status ($\chi^2 = 28.67$, $p = <0.001$) being highest in the booked parturients (91.97%), followed by those that were booked elsewhere (79.17%), those that unbooked (63.26%) and those only registered (57.14%). The proportions of live infants that had APGAR scores of less than 4 at one and five minutes respectively, were as follows: booked 2.92% and 1.46%, booked elsewhere 9.72% and 6.94%, registered 28.57% and 0%, unbooked 18.37% and 16.33%.

Augmentation of labour was required in 12.88% of the parturients. There was no significant difference in the proportion of parturients that had augmentation of labour in the two groups ($\chi^2 = 2.015$, $p = 0.16$). The mode of delivery was not significantly associated with antenatal pelvimetry as shown in Table 2. There was no significant association between antenatal clinical pelvimetry and mode of delivery even after controlling for gestational age and birth weight.
Details of separate comparisons of the various modes of deliveries in the two groups of parturients are shown in Table 3. There was no significant association between antenatal clinical pelvimetry and duration of labour or mode of delivery even after controlling for booking status and birth weight.

Table 1: Labour outcome in parturients who had adequate pelvis at antenatal clinical pelvimetry and those who did not have antenatal pelvimetry

<table>
<thead>
<tr>
<th>Variables (means)</th>
<th>Pelvis adequate (a)</th>
<th>Pelvis not assessed (b)</th>
<th>a-b (95% CI)</th>
<th>T-test (p value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of labour</td>
<td>420 minutes</td>
<td>417 minutes</td>
<td>3 minutes (-96, 89)</td>
<td>0.08 (0.93)</td>
</tr>
<tr>
<td>Intrapartum blood loss</td>
<td>334 mls</td>
<td>382 mls</td>
<td>48 mls (-33, 129)</td>
<td>1.17 (0.25)</td>
</tr>
<tr>
<td>1 minute APGAR</td>
<td>8.89</td>
<td>7.44</td>
<td>1.45 (-2.07, -0.84)</td>
<td>-4.99 (&lt;0.001)</td>
</tr>
<tr>
<td>5 minute APGAR</td>
<td>9.62</td>
<td>8.24</td>
<td>1.38 (-1.95, -0.82)</td>
<td>-4.85 (&lt;0.001)</td>
</tr>
</tbody>
</table>

CI = confidence intervals

Table 2: Modes of delivery in parturients who had adequate pelvis at antenatal clinical pelvimetry and those who did not have antenatal pelvimetry

<table>
<thead>
<tr>
<th>Pelvis</th>
<th>SVD (%)</th>
<th>Forceps or vacuum (%)</th>
<th>CS (%)</th>
<th>DD (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adequate</td>
<td>63 (85.14)</td>
<td>5 (6.76)</td>
<td>6 (8.11)</td>
<td>0</td>
<td>74 (100)</td>
</tr>
<tr>
<td>Not assessed</td>
<td>142 (74.74)</td>
<td>13 (6.84)</td>
<td>33 (17.37)</td>
<td>2 (1.05)</td>
<td>190 (100)</td>
</tr>
<tr>
<td>Total</td>
<td>205 (77.65)</td>
<td>18 (6.82)</td>
<td>39 (14.77)</td>
<td>2 (0.76)</td>
<td>264 (100)</td>
</tr>
</tbody>
</table>

χ² = 4.61, p = 0.20; SVD = spontaneous vaginal delivery; CS = caesarean section; DD = destructive delivery

Table 3: Separate comparisons of modes of delivery in parturients who had adequate pelvis at antenatal clinical pelvimetry and those who did not have antenatal pelvimetry

<table>
<thead>
<tr>
<th>Modes of delivery compared</th>
<th>χ²</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVD/Instrumental &amp; Destructive/CS</td>
<td>3.92</td>
<td>0.14</td>
</tr>
<tr>
<td>SVD/Instrumental and Destructive</td>
<td>0.28</td>
<td>0.59</td>
</tr>
<tr>
<td>SVD/CS</td>
<td>3.81</td>
<td>0.05</td>
</tr>
</tbody>
</table>

SVD = spontaneous vaginal delivery; CS = caesarean section

Discussion

Antenatal clinical pelvimetry in this study was not significantly associated with the duration of labour even after controlling for booking status or birth weight. The mean duration of labour was about 7 hours in both groups of parturients. There was also no significant difference in the estimated blood loss at delivery in both groups.

Although the caesarean section rate was 8.11% among parturients who had adequate pelvis at antenatal clinical pelvimetry and 17.37% among those who did not have antenatal pelvimetry, this difference was just insignificant (p = 0.05). This suggests that the caesarean section rate may be higher among parturients who did not have antenatal clinical pelvimetry as a larger sample size may reveal a significant association. A previous study has reported a correlation between low true conjugate values and the probability of caesarean section, although there have also been reports of no significant association between clinical pelvimetry and caesarean section. Other modes of delivery were not significantly associated with antenatal pelvimetry as has been previously reported. The mode of delivery was not significantly associated with antenatal clinical pelvimetry even after controlling for birth weight.

The APGAR scores at one and five minutes were significantly higher for infants born to mothers who had adequate pelvis at antenatal clinical pelvimetry as compared to those who did not have pelvimetry in the antenatal period. This may have been because those who did not have antenatal clinical pelvimetry were unbooked parturients who are more likely to present with labour complications that may jeopardise foetal well-being. This is supported by the lack of significant association between clinically adequate pelvis and APGAR scores in booked mothers. The finding of significant association between booking status, APGAR scores at one, and five minutes provides further evidence with the booked parturients having the least proportion of severely asphyxiated infants and the highest proportion of infants with APGAR scores of 8 or more. A previous report has documented the higher rates of labour complications among unbooked parturients in this centre. A significant association between clinically adequate pelvis in the antenatal period and better APGAR scores has also been reported previously. X-ray pelvimetry on the other has been found not to have
any significant predictive value for perinatal outcome.

The findings in this study suggest that antenatal clinical pelvimetry may have predictive value for caesarean section and for foetal outcome. The practice should, therefore, be encouraged in all primigravidae in this environment where adequate foetal monitoring facilities are not widely available. The positive effect of antenatal care on foetal outcome is also highlighted and public awareness campaigns on the benefits of antenatal care should be intensified in this environment where about 30% of all pregnant women do not have any antenatal care at all and another 17% book at six to seven months of pregnancy. There is a need for prospective studies on the predictive value of antenatal clinical pelvimetry for foetal outcome and caesarean section.

References