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The effects of established and gestational diabetes on pregnancy outcome at Harare Maternity Hospital

M Z CHIRENJE

SUMMARY

A study was carried out to determine the effect of established and gestational diabetes on pregnancy outcome over a period of two years at Harare Maternity Hospital, Harare, Zimbabwe. During the period, 51 patients with established diabetes mellitus and 70 patients with gestational diabetes were treated. The perinatal mortality was higher among this group (124 per 1 000) compared with the rest of the total hospital population (44 per 1 000) who delivered during the same period.

INTRODUCTION

Established diabetes is well recognised as a cause of increased perinatal mortality (Connell et al 1985) whilst the clinical significance of abnormal glucose tolerance identified in pregnancy remains controversial (Beard and Hoet 1982, Jarret, R J, 1981, Al-Sawaf et al 1988).

In Harare Maternity Hospital, the patients with established diabetes mellitus are treated with insulin and those with glucose intolerance first diagnosed in pregnancy (gestational diabetes) are treated with diet alone or with diet and insulin.

Correspondence to:
M Z Chirenje
Department of Obstetrics and Gynaecology
University of Zimbabwe
P O Box A178
Avondale
Harare
The purpose of this study was to determine the foetal outcome on women with established diabetes and gestational diabetes as measured by perinatal mortality and foetal birth-weight.

MATERIALS AND METHODS

A retrospective analysis of the records of all patients who had established diabetes and those with gestational diabetes and delivered at Harare Maternity Hospital between January 1, 1990 to December 31, 1991 was done.

Diabetes was classified as "established" if the disease was known to be present and was being treated before pregnancy. These were mainly patients referred from city clinics, Harare Hospital Medical OPD, District and Provincial hospitals and general practitioners.

A diagnosis of gestational diabetes was made in a pregnant women whose carbohydrate intolerance was first recognised during that current pregnancy using WHO (1980) criteria.

At booking of a current pregnancy, selective screening with a glucose load test was done in any woman with any of the following risk factors: namely previous history of unexplained still-births, previous delivery of macroscopic baby (birth-weight >4kg), first degree relative with insulin dependent diabetes mellitus, polyhydramnios in current pregnancy, glycosuria on more than two occasions and those with bad obstetric history.

To perform the glucose load test, 50gm of oral glucose is given to the pregnant woman without regard to time of day or last meal. If the venous plasma glucose level measures one hour later is ≥ 7.8 mmol/l a complete glucose tolerance test is performed (Beard et al 1980, O'Sullivan et al 1973b).

At Harare Maternity Hospital, an oral glucose tolerance test (OGTT) is performed with a 75gm glucose load in a patient who has starved from the previous night and glucose intolerance is shown by fasting blood glucose levels at ≥ 6.0 mmol/l and 2-hour levels of ≥ 7 mmol/l.

Once a diagnosis of gestational diabetes is established from OGTT, treatment starts with a diabetic diet and if subsequent glucose profiles do not show acceptable glucose haemostasis of between 4-6mmol/l, insulin treatment is commenced (Fraser R B, 1991, Burdnell, M and Doddridge, M C 1989).

RESULTS

A total of 121 patients were treated from January 1990 to December 1991. This represents about 0.04 pc of all deliveries during that period. Of the 121 cases, 51 (42 pc) were established diabetes and 70 (58 pc) were gestational diabetes. Among the gestational diabetics only 19 (27 pc) were treated with diet compared with 51 (73 pc) who were treated with diet and insulin.

Table I shows that perinatal mortality rate is higher for the diabetic patients (124 per 1000), compared to the total hospital population (44 per 1000). Established diabetics had a higher perinatal mortality (196 per 1000) compared to those with gestational diabetics (71 per 1000).

<table>
<thead>
<tr>
<th>Group</th>
<th>All deliveries</th>
<th>All babies born</th>
<th>Still-births (per 1,000 births)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total hospital</td>
<td>34,362</td>
<td>35,454</td>
<td>1555 (44)</td>
</tr>
<tr>
<td>Established diabetics</td>
<td>51</td>
<td>51</td>
<td>10 (196)</td>
</tr>
<tr>
<td>Gestational diabetics</td>
<td>70</td>
<td>70</td>
<td>5 (71)</td>
</tr>
</tbody>
</table>

Table II shows details of perinatal deaths. The excess loss of macerated still-births, with no explanation for the deaths, tended to occur in late pregnancy and in macroscopic babies whose mothers were on insulin.

DISCUSSION

It is important to point out the disadvantages of this study: firstly that data collection was retrospective, resulting in possible inaccuracy on total number of patients with diabetes in pregnancy. This may explain why there is such a small number of patients with diabetes in pregnancy. This may explain why there is such a small number of patients with diabetes in pregnancy. This may explain why there is such a small number of patients with diabetes in pregnancy. This may explain why there is such a small number of patients with diabetes in pregnancy.

In most regions of the world, the incidence of gestational diabetes varies from 1.6 pc to 2.5 pc (Beard R W, 1982, O'Sullivan J V, 1973). A strict criteria of diagnosis should be followed as recommended by W.H.O. (1980).
Table II: Details of Perinatal Deaths

<table>
<thead>
<tr>
<th>Age (yrs)</th>
<th>Parity</th>
<th>Type of diabetes</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 38</td>
<td>8</td>
<td>G.D.</td>
<td>Ruptured uterus, fresh SB at term, 4357 gm</td>
</tr>
<tr>
<td>2. 32</td>
<td>5</td>
<td>IDDM</td>
<td>breech, IUD at term 6100 gm</td>
</tr>
<tr>
<td>3. 39</td>
<td>3</td>
<td>IDDM</td>
<td>Emergency LSCS for arm prolapse, 4100 gm, died 1/7</td>
</tr>
<tr>
<td>4. 17</td>
<td>0</td>
<td>IDDM</td>
<td>IUD at 30 wks, 2630 gm</td>
</tr>
<tr>
<td>5. 39</td>
<td>5</td>
<td>IDDM</td>
<td>Macerated SB at term 6400 gm</td>
</tr>
<tr>
<td>6. 34</td>
<td>7</td>
<td>IDDM</td>
<td>Macerated SB at 34 wks 2500 gm</td>
</tr>
<tr>
<td>7. 19</td>
<td>1</td>
<td>IDDM</td>
<td>SB at 39 wks 3800 gm</td>
</tr>
<tr>
<td>8. 38</td>
<td>9</td>
<td>GD + PIH</td>
<td>SB at 35 wks 2100 gm</td>
</tr>
<tr>
<td>9. 24</td>
<td>1</td>
<td>GD</td>
<td>Preterm labour at 30 wks, 1900 gm, Neonatal death at 27</td>
</tr>
<tr>
<td>10. 31</td>
<td>7</td>
<td>IDDM + PIH</td>
<td>Macerated SB at 28 wks 800 gm</td>
</tr>
<tr>
<td>11. 39</td>
<td>5</td>
<td>IDDM</td>
<td>Hydrocephalus + spina bifida diagnosed by USS at 35 wks, decompression of head done</td>
</tr>
<tr>
<td>12. 26</td>
<td>3</td>
<td>IDDM + PIH</td>
<td>Ketaocidosis at 30 wks macerated SB 1110 gm</td>
</tr>
<tr>
<td>13. 32</td>
<td>5</td>
<td>IDDM</td>
<td>Referred at 36 wks on oral hypoglycaemics, macerated SB 6100 gm</td>
</tr>
<tr>
<td>14. 35</td>
<td>5</td>
<td>GD + PIH</td>
<td>IUD at 37 wks 4400 gm</td>
</tr>
<tr>
<td>15. 40</td>
<td>4</td>
<td>GD + PIH</td>
<td>Macerated SB at 34 wks 2500 gm</td>
</tr>
</tbody>
</table>

CD = Gestational Diabetes
IDDM = Insulin Dependent Diabetes Mellitus
SB = Still-born
IUD = Intra Uterine Death
PIH = Pregnancy Induced Hypertension
LSCS = Lower Segment Caesarean Section
USS = Ultra Sound Scan

Late referral in established diabetes results in poor control and subsequent higher foetal loss as shown by Case 12 who was sent from a district hospital at 30 weeks in ketoacidosis. Case 13 who was referred at 36 weeks on chlopropramide illustrates why we do not use oral hypoglycaemic drugs in pregnancy because of poor control and risk of congenital malformation (Brudness M et al, 1989).

The long-term implications for this study are firstly to establish the normal glucose haemostasis among pregnant and non-pregnant Zimbabwean women of reproductive age. Secondly, we would like a prospective study on established and gestational diabetics to see if present management can be improved for a better outcome on this population.

REFERENCES

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