

Deleterious effect of minor abnormalities of glucose tolerance during pregnancy: Effect of intervention on foetal outcome

S. Venkataraman, V. Seshiah, N. Manjula, R. Madhavan, A. Sundaram, C. M. Seshasaiyanam and K. Suresh

ABSTRACT

We investigated the impact of minor forms of abnormal glucose intolerance (AGT) on pregnancy outcome. We studied 1178 pregnant subjects with bad obstetric history (BOH). Based on an oral glucose tolerance test (100 gm glucose load), minor forms identified were:

1. Impaired Gestational glucose Tolerance (IGGT) and 2. Isolated Abnormality of Blood Glucose (IABG). It was found that the so-called minor forms of AGT are associated with a very high percentage of foetal loss in the previous pregnancies.

126 subjects of AGT that were available for follow-up were treated with insulin to achieve a mean pregnancy plasma glucose of 105 mg%. Good foetal outcome was observed in 98.4%. The foetal loss of 1.6% is comparable to that of the general antenatal population.

INTRODUCTION

Gestational Diabetes Mellitus (GDM) is associated with increased perinatal morbidity and mortality (1). With identification and treatment of GDM, significant reduction in perinatal mortality has been observed (2). However the impact of minor forms of abnormal glucose tolerance (AGT) on pregnancy outcome has been appreciated only very recently. In this study the effect of minor forms of AGT and the effect of therapeutic intervention in such minor forms of AGT on the outcome of pregnancy were analysed.

MATERIAL AND METHODS

The study group consisted of 1178 pregnant subjects with Bad Obstetric History (BOH), defined as loss of one or more foetus in the previous pregnancies. Subjects were tested and found negative for syphilis, Rh incompatibility, anaemia and urinary tract infection, factors commonly associated with BOH. Oral glucose tolerance test was performed with 100g glucose load. Minor forms of AGT identified were

1. Impaired Gestational Glucose Tolerance (IGGT) and
2. Isolated Abnormality of blood Glucose (IABG)

IGGT was diagnosed if two hour post-glucose value fell between 100 and 144 mg% and IABG was diagnosed if any one of the four values namely 0, 1, 2, 3 hrs following the 100g glucose load exceeded the cut off levels of National Diabetes Data Group (NDDG) as follows:

NDDG criteria for diagnosis of GDM

Time interval	0 hr	1 hr	2 hr	3 hr
Blood glucose (mg%)	90	165	145	125

The prevalence of minor forms of AGT in the study population was determined and the foetal loss in the previous pregnancies was correlated with the type of AGT during the index pregnancy. Among the subjects available for follow-up, periodic glycaemic assessment was made and

Type of AGT	No. of subjects	Percentage
Impaired gestational glucose tolerance	483	40.9
Isolated abnormality of blood glucose	70	5.9

From: Department of Diabetology, Madras Medical College and Govt. General Hospital, Madras-600 003.

Table 2
Correlation of foetal wastage in previous pregnancies with the type of AGT during the present pregnancy

Type of AGT	No. of previous pregnancies	No. of wasted pregnancies	% of wasted pregnancies
Impaired gestational glucose tolerance	1279	983	76.9
Isolated abnormality of blood glucose	142	119	83.8

treatment with insulin instituted to achieve a mean pregnancy plasma glucose of 105mg% (the average of fasting plasma glucose of < 90mg%, and two hour post prandial glucose of < 120mg%). The foetal outcome was recorded.

RESULTS

The prevalence of minor forms of AGT among subjects with BOH is given in Table I.

The prevalence of foetal wastage in previous pregnancies in the two categories of minor forms of AGT are given in Table II.

Thus it will be observed that the so called minor forms of AGT are associated with a very high percentage of foetal loss in the previous pregnancies. Among these subjects, 126 were followed up till term. Good foetal outcome was observed in 124 subjects (98.4%). The foetal loss of 1.6% is comparable to that of the general antenatal population.

DISCUSSION:

It has been clearly established that GDM is associated with an excess of perinatal mortality. Numerous workers have documented the beneficial effect of intervention in GDM with respect to foetal outcome (3). These observations highlight the effect of maternal hyperglycaemia on the foetal outcome. In practice, not much importance is given to the minor forms of AGT. The work by Langer et al (4) has precisely clarified this misconception. They have established that the glycaemic excursions amongst subjects who have IABG are above the normal subjects who have normal values in OGTT. Further more these elevated ambulatory glucose levels were significantly correlated with the foetal macrosomia (5).

In the present study minor forms of AGT are found to be associated with a very high percentage of foetal loss. In the background of the work by Langer et al, it is tempting to speculate that the glycaemic excursions in subjects with minor forms of AGT might have contributed to the previous foetal loss. Additional evidence for suggesting such a correlation is obtained by prospectively following up such subjects with minor forms of AGT till term, maintaining mean pregnancy plasma glucose values to less than 105 mg%. The foetal loss with such an approach approximates that documented in the general antenatal population.

It is thus concluded that minor forms of AGT have a deleterious effect on foetal outcome. Identification and treatment of such subjects results in marked reduction of perinatal mortality.

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