

PERINATAL OUTCOME IN BABIES BORN TO MOTHERS WITH ABNORMALLY HIGH MATERNAL GLUCOSE LEVELS A CASE CONTROLLED PROSPECTIVE STUDY

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SUMMARY

Perinatal outcome in babies born to mothers with abnormally high blood glucose levels is studied by a prospective case controlled study. Fifty cases were studied in a year. It was found that these babies were significantly heavier and taller. They had a sever times higher incidence of R. D. S. They tend to have a higher congenital malformation rate and a higher neonatal complication rate besides R. D. S. Hypoglycemia was the most common amongst neonatal complications.

INTRODUCTION

Abnormal maternal glucose levels can lead to detrimental effects on the pregnant mother as well as her child effects ranging from preterm labour to post datism (O'Sullivan et al 1964) have been hinted as that resulting from these abnormal maternal glucose levels. So as to examine the effects of abnormal maternal blood glucose levels on perinatal outcome, we carried out the present case controlled prospective study.

MATERIAL AND METHODS

This study was carried out in the dept. of Obstetrics and Gynecology at S. S. G. Hospital and Medical College, Baroda over a period of one year from 1 March 1991 to 29th February 1992. Initially all antenatal mothers were screened by a glucometer for Random Blood Sugar (R. B. S.) 110 mgm% was accepted as a cut off point (Norder Bander - 1978). These were all mothers who attended the antenatal clinic of our unit (Unit III) during the study period. On the basis of this RBS levels, they were grouped into two groups :

Group A : Indexed cases with RBS more than 110 mgm %.

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Group B : Controls with RBS less than 110 mgm % subjected to routine antenatal care only.

Each case of group A was attached to a consequetively registered control of group B matched for gestational age, parity and area of origin (urban / rural). All patients were followed up and their perinatal outcome was recorded.

Once enrolled in the study, one case with one control, each of these study group patients were subjected to Fasting Blood Sugar (F. B. S.) and Post Glucose - two hour Blood Sugar (PG₂BS) examination. If it turned out to be abnormal an oral GTT was carried out. If any controlled group patient showed an abnormal PG₂BS and subsequent GTT anomaly, she was dropped from the study and another controlled case equally maticulously matched was enrolled. Repeat FBS / PG₂BS examination was carried out at or after 28 weeks if the patient was screened first during early pregnancy.

All patients with frank diabetes mellitus were treated with dietary control + insulin therapy in joint consultation with physicians. All patients of gestational diabetes and impaired GTT group were advised dietary control only. Obviously control group subjects were

RESULTS

During the study period of one year a total of 50 cases were identified and thus grouped in Group A (indexed cases). An equal number (n = 50) served as controls.

As shown in Table I, mothers with abnormal glucose levels give births to significantly heavier babies.

As shown in Table II, babies born to mothers with abnormal glucose levels give birth to taller babies, the difference being statistically significant.

Only 1 S. B., which was a fresh one, was found in the case group (Group A). However statistical indices were not applied as the sample was too small.

A significantly higher number of babies born to mothers with abnormal glucose levels developed RDS, inspite of the fact that they were heavier and taller. Though seemingly in the same table (Table IV) incidence of congenital anomalies was three times higher than the controls, once again the sample size being too small, statistical indices were not applied, for validating the difference statisti-

Table I
Birth Weights

Weight (in gms.)	Group A		Group B	
	No.	%	No.	%
1000 to 1500	00	—	00	—
1501 to 2000	01	2	01	2
2001 to 2500	01	2	02	4
2501 to 3000	16	32	30	60
3001 to 300	17	34	17	34
More than 3500	15	30	01	02

X² = 16.51 (significant)

Table II

Length of the newborn

Length (cms.)	Group A		Group B	
	No.	%	No.	%
Less than 50	11	22	24	48
50 cms or more	39	78	26	52

$X^2 = 7.428$ (Significant)

Table III

R. D. S. & Congenital Anomalies

	Group A		Group B	
	No.	%	No.	%
R. D. S.	07	14	01	2
Congenital Anomalies	03	06	01	2
- Cleft lip	01	02	01	2
- C T E V	01	02		
- Sacral agensis	01	02		

Table IV

Other Neonatal Complications

Complications	Group A		Group B	
	No.	%	No.	%
Hypoglycemia	11	22	03	06
Hypothermia	03	06	02	04
Hyper Bilirubinemia	10	20	11	22
Polycythemia	01	02	00	00

X^2 test for RDS at df 1 = 6.24 which is significant with P value less than 0.05.

X^2 for hypoglycemia significant.

Overall X^2 test for neonatal complications : Significant.

cally.

As shown in Table IV, neonatal complications were significantly higher in neonates of mothers in Group A. Significantly, amongst the complications, hypoglycemia was most distinctly higher and this difference was found to be statistically significant.

DISCUSSION

Some quite interesting results emerge from this study, which was a prospective case controlled one. Fetal hypersomatism, distinctly found in the present study, in babies born to mothers with abnormal blood glucose levels is now explained by Stoestel et al (1981). He attributes it to hyperinsulinemia & increased HPL. Stubb and Meyer (1981) suggested that hyperglycemia in the third trimester leads to excessive fat deposition in the newborn infant.

It is also significant to note that though they have a hypersomatism, babies born to mothers with abnormal glucose levels have a higher chance of developing respiratory distress syndrome (RDS). Thus, though heavier in weight their pulmonary functions are not matured adequately enough. This is found distinctly in the present study. Norlander et al (1989) also showed similar results.

A myriad of congenital anomalies have been attributed to mothers with abnormal blood glucose levels. Though the present study had three such cases in contrast to only one in control group, this number is too small to draw any conclusions.

Other neonatal complications were significantly higher in Group A babies. Norlander et al (1989) also found higher incidence but in their series polycythemia was more significant. However in the present study hypoglycemia was the most frequent encountered complication.

CONCLUSION

From this study it can be concluded that babies born to mothers with abnormal glucose levels are heavier in weight and taller in length. They develop RDS significantly more often and tend to have a higher congenital anomaly rate. These babies also have a higher chance of developing neonatal complications of which neonatal hypoglycemia was most common.

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