

## GLYCOSYLATED HEMOGLOBIN LEVELS IN DIABETIC AND NON-DIABETIC PREGNANCY

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### SUMMARY

A study was conducted to determine the norms of Glycosylated hemoglobin levels (GHb) in normal, uncomplicated pregnancies (15), gestational diabetics (12) and insulin dependent diabetic pregnancies (4). The glycosylated hemoglobin levels were found to be markedly raised in insulin dependent diabetics ( $9.5575 \pm 0.835$ ) and slightly raised in gestational diabetics ( $7.1395 \pm 0.518$ ) as compared to normal pregnancy ( $7.0713 \pm 1.8$ ). GHb levels are known to reflect blood sugar control over previous 8 weeks and in our study they were found to correlate well with blood glucose levels ( $r=0.9699$ ) ( $p<0.001$ ).

### Introduction

Poor Glycemic control in the first trimester of pregnancy is associated with increased frequency of congenital malformations in the fetus (Ylinen et al 1984). Perinatal complications such as hypoglycemia and hyperbilirubinemia are also more common in patients with poor glycemic control (Ballard et al 1985). Thus effective control of diabetes is essential for achievement of favourable perinatal outcome. Glycemic control may be assessed by blood glucose panel or by Glycosylated hemoglobin estimations. Blood glucose panel is tedious, requires greater patient

compliance and reflects glycemic control of only one particular day while Glycosylated haemoglobin level reflects glycemic control over previous 8 weeks (Koenig et al 1976) requires minimal patient compliance and is less tedious.

The study aims at determining GHb levels in normal pregnancy as well as in Gestational diabetics and Insulin dependent diabetic pregnancies and to correlate GHb levels with blood sugars to assess their reliability as an indicator of glycemic control.

### Material and Methods

Glycosylated haemoglobin estimations were done at two monthly intervals in a total of 31 patients, consisting of 15 normal pregnancies, 12 gestational dia-

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betics. Glycosylated haemoglobin (GHb) levels were estimated by colorimetric assay (Fluckiger and Winterhalten 1976). Fasting, as well as 2 hours postprandial blood sugars were estimated within 2 days of glycosylated haemoglobin estimations.

All patients included in this study underwent regular antenatal check up in high risk pregnancy clinic of AIIMS.

### Results

The average age of 31 patients included in this study was 24.67 years, range being 21-32 years.

The Mean glycosylated haemoglobin and Fasting Blood Sugar levels in normal, gestational diabetics (GDM) and insulin dependent diabetic (IDDM) pregnancies are depicted in Table I.

Thus, it may be concluded that Glycosylated haemoglobin levels may serve as a valuable tool indicating glycemic control during first, second and third trimester of pregnancy, postnatal and in the pre-conceptional period. Its levels in pre-conceptional period and during first trimester of pregnancy will assist in predicting the risk of congenital malformations and thus aid in genetic counselling. GHb levels during second and third trimester of pregnancy will aid in optimum management of pregnant diabetic women. GHb estimation requires less patient compliance and reflects a comprehensive picture of glycemic control over previous few weeks, rather than day to day glycemic control as seen with blood sugar panel.

TABLE - I  
MEAN GLYCOSYLATED HAEMOGLOBIN (GHb) AND FASTING BLOOD SUGAR (FBS) LEVELS IN NORMAL AND DIABETIC PREGNANCY.

	Normal	GDM	IDDM
Mean GHb (%)	7.0713 ± 1.0	7.1395 ± 1.78	9.5575 ± 0.835
Mean FBS (mg/dl)	77 ± 12/16	90 ± 9.46	98 ± 14

### Discussion

Mean GHb was markedly raised in Insulin dependent diabetic pregnancy (9.5575 + 0.885) as compared to normal pregnancy (7.071 + 1.0). This is in accordance with the observations made by Susheela et al (1984) and Elseweidy et al (1984). Mean GHb was also raised in gestational diabetics (7.1395 + 1.75) but the rise was not statistically significant. This was possibly due to excellent glycemic control achieved in the gestational diabetics included in this study. Glycosylated haemoglobin correlated well with blood glucose levels ( $r=0.9699$ ) ( $P<0.001$ ).

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