# CLINICAL AND BIOCHEMICAL EXPERIENCE WITH DIABETES AND PREGNANCY

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## SUMMARY

**Pregnancy complicated by diabetes mellitus resulted in significant foetal morbidity and mortality in the past, which has been steadily declining as a result of better glycemic control. We present a retrospective analysis of diabetic patients with pregnancy attending the Endocrine unit of Institute of Medical sciences, Srinagar from Jan 1993 to Dec. 1994. A total of twenty five (25) patients including thirteen (13) pregestational and twelve (12) gestational diabetes mellitus were seen. Most of the patients were > 25 years of age in both groups mainly presenting in the second trimester. All the patients in the pregestational group were White class B (100%), while at 58.3% comprised gestational diabetes class B, 33.3% were class A1 and 8.3% were class A2. Fasting blood glucose levels at presentation were similar in both groups however gestational diabetes mellitus patients needed lower mean insulin units/day for glycemic control.**

## *INTRODUCTION*

Pregnancy is the only physiological event of a diabetogenic nature, particularly in the late gestation, the insulin requirements of women with previously known diabetes may increase and diabetes may become manifest in women with previously undiagnosed asymptomatic diabetes mellitus (Metzger 1989). Metabolic changes especially related to pregnancy find their first expression during the latter half of gestation, coincident with the increasing elaboration of metabolically active steroids and peptide by placenta and escalating and unremitting fuel demands of the growing

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conceptus (Idem 1965). These changes are accompained by alterations in those of the circulating insulin, basal insulin levels are higher than nongravid levels, especially in late pregnancy, and alimentation effects a two to three fold greater outpouring of insulin (Frenkel 1980). The chronic and acute increase in plasma insulins are attended by diminished responsiveness to insulin action in the periphery, the resistance appears to be meditated at the postreceptor level. (Puavilai et al 1982). Gestational diabetes mellitus defined as carbohydrate intolerance of variable severity with onset or first recognition during pregnancy complicates 2 to 3 percent of all pregnancies in the United states (Gabbe et al 1986). Dramatic improvement has been achieved in improving perinatal mortality among pregnant diabetic women and this has been as a result of maternal education, early and strict control of blood glucose levels and obstetrical surveillance. Most of the literature concerning diabetes and pregnancy has come from developed countries, developing countries have contributed little in this aspect of diabetes (Hadden et al 1985). This retrospective analysis is an endeavor to present the clinical spectrum of pregestational and gestational diabetes mellitus attending Endocrinology clinic at Institute of Medical Sciences, Srinagar.

## *MATERIAL AND METHODS*

Records of patients of pregestational and gestational diabetes mellitus admitted in the Endocrinology Department from January 1993 to December, 1994 were screened. Gestational diabetes mellitus had been confirmed in all patients by 100gm oral glucose tolerance test according to criteria of O'Sullivan (O'Sullivan et al, 1964) i.e. two or more of the following venous plasma glucose concentrations met or exceeded fasting 105 mg/dl, one-hour 190 mg/dl, two hour 165 mg/dl and three-hour 145 mg/dl. OGTT was performed in these patients after they had presented with either osmotic symptoms or were referred from obstetrical clinics on detection of either glycosuria or elevated routine blood glucose levels. Pregestational diabetics were patients of type-I diabetes mellitus or NIDDM who were on follow up of Endocrine clinic or first time presented for consulation.

Records of all the patients were thoroughly analysed with particular emphasis on age, duration of symptoms, time of presentation, mode of presentation (White class, GDM class. (White 1965), height, weight, BMI besides evidence of neuropathy, nephropathy, retinopathy, peripheral vascular disease and coronary artery disease. Analysis of investigations included haemogram, serum urea, creatinine, plasma blood glucose levels, fasting and 2 hour post-prandial at the time of presentation in case of pregestational diabetes mellitus, fasting and 2 hour post-parandial values in gestational diabetes mellitus obtained from 100 gm OGTT. Type of insulin given with dosage to control diabetes was also analysed in all patients.

## *RESULTS*

Table I summarizes the maternal characteristics, biochemical profile and insulin requirements in pregestational and gestational diabetes mellitus. A total of twenty five (25) patients of diabetes with pregnancy attended Endocrine unit of Institute of Medical Sciences, Srinagar Kashmir from January

**Table I**
**Clinical and biochemical profile of gestational diabetes mellitus and pregestational diabetes mellitus**

| | Pregestational DM n=13 | Gestatitional DM n=12 |
|---|---|---|
| Age at presentation (Mean+SDyrs) | 28.23+6.75 | 27.42+5.25 |
| Age > 25 yrs | 76.9% | 66.6% |
| Time of presentation (Mean_SD wks) | 17.69+6.10 | 20.68+8.31 |
| First Trimester | 15.38% | 25.0% |
| Second Trimester | 69.23% | 58.33% |
| Third Trimester | 15.38% | 16.66% |
| Pregnancy class | White class 13(100%) | GDMA1-4(33.33%) GDMA2-1(8.3%) GDMB1-7(58.37%) |
| Past obstetrical history | 5 Still births | 1 |
| | 1 Abortion | 4 |
| | - Caesarean section | 1 |
| Wt.(Kg) (Mean+SD) | 50.69+4.9 | 56.75+3.70 |
| BMI | 23.74+0.94 | 21.01+0.80 |
| Parity | | |
| Primigravida | 5(38.96%) | 7(58.33%) |
| 1-4 | 7(53.89%) | 4(31.33%) |
| >5 | 1(7.69%) | 1(8.33%) |
| Blood glucose (F) at presentation (Mean±SD mg/dl) | 149.62+46.17 | 151.42+56.73 |

1993 to Dec. 1994. Of these thirteen (13) were pregestational diabetes mellitus and twelve (12) were gestational diabetes mellitus patients. No significant difference in mean age was observed between two groups which in pregestational group ranged from 18-40 years with a mean age of 28.23±6.75 years, while in gestational group it ranged from 18-38 years with a mean of 27.42+5.25 years. 76.9% and 66.6% women were over 25 years of age in progestational and gestational diabetic group respectively. Two patients in gestational diabetes group had family history of diabetes mellitus and these patients presented with osmotic symptoms, among pregestational group only one patient

had such history. One patient of gestational diabetes mellitus group had positive IgM titre against toxoplasmosis and received cyclic spiramycin. All the patients in pregestational diabetes were White class B (100%) seven (7) patients in gestational diabetes group were GDMB1, Four (4) were GDMA1 and only one patient was GDMA2. Majority of patients presented in second trimester in both groups 69.23% and 58.37%. Patients in pregestational group presented between 14-28 weeks of gestation with mean+SD of 17.69+6.10. Gestational diabetes group patients presented between 12-33 weeks of gestation with a mean+SD of 20.08+8.31 weeks. Mean overnight fasting glucose at presentation was 149.62+46.17 mg/dl in pregestational group while in gestational group it was 151.42+56.73 mg/dl.

One patient in gestational diabetes group was controlled on diet alone, rest of eleven patients (91.6%) needed insulin for control of blood sugars. All the patients (100%) in pregestational group needed insulin for control of blood sugar, insulin requirement in gestational diabetes group was 24.73+16.79 U/day as compared to higher levels 36.54 20.95 needed for pregestational group.

## *DISCUSSION*

The adverse effects of glycosuria and carbohydrate intolerance on pregnancy and fetal outcome were described nearly 100 years ago (Williams 1909). Due to improved care of paregnancy women with insulin dependent diabetes mellitus, perinatal mortality has approximated to 1.6 to 2%, that found in the general population (Adashi et al 1979).

An evolving emphasis on "Team care" improved approaches to the management of diabetes, liberal hospitalization for the metabolic regulations of the mother and obstetric monitoring of the foetus have been implicated for attaining better results.

In our study mean maternal age of gestational diabetes was 27.42+2.25 yrs. which is in accordance with earlier published study by Sepe et al 1985, while as for pregestational diabetes mellitus it was higher with a mean of 28.23+6.75. Majority of patients in both groups presented in second trimester of pregnancy 69.23% and 58.33% in pregestational and gestational diabetes group. Akiel & Laajam 1990 in his study has reported pregnant women with diabetes mellitus presenting in third trimester of pregnancy. In the same study all the patients of pregestational group were White class A while as in our study all were of class B. Gestational diabetes mellitus group patients were mostly of GDM class B1. Significant obstetrical history was noted in both groups in our study i.e. three (3) still births in one patient of pregestational group among total five still births while as in gestational diabetes mellitus group four (4) patients had history of one abortion each in past related to uncontrolled diabetes. Gabbe 1986 reported occurrence of foetal deaths in utero, neonatal respiratory distress syndrome and birth trauma and asphyxia resulting due to macrosomia. In our study one patient had positive serology for toxoplasmosis, in GDM group. Another patient in pregestational had benign recurrent cholestasis of pregnancy. This patient had three (3) still births in past. All the patients except one patient in gestational diabetes group needed insulin therapy for glycemic control, similar trend

was reported by Akiel & Laagam 1990 while Gabbe 1986 reported lower percentage of patients needing insulin for control of blood sugars. Mean daily insulin requirement statistically did not differ in two groups in our study. Pregestational group requiring 36.54 20.95 units/day while gestational diabetes group needed 24.73 16.79 althogh this was not statistically significant (p>0.5) but mean fasting blood glucose levels were almost identical in both groups 149.62+46.17 mg/dl in pregestational group and 151.42+56.73 mg/dl gestational diabetes mellitus. No definite difference was observed in routine investigation however, haemoglobin concentration showed a significant difference (p,0.5) between two groups.

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