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Clinical Forum

Outcome of insulin requiring diabetic pregnancies at the Al Corniche Hospital.

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Abstract
The aim of this study was assess the outcome of diabetic pregnancies requiring insulin under the care of a Combined Diabetic Team and to evaluate the necessity of pre-pregnancy counseling. This is a prospective study undertaken for a 2 year period (Jan 2001 to Dec 2002) at Al Corniche Hospital, Abu Dhabi. Three hundred and eighty six pregnant diabetic women requiring insulin at varying gestations were looked after by Combined Diabetic Team (Team "0") during the pregnancy and early postpartum period, and then re-transferred back to original teams. Audit forms with comprehensive details were maintained and data were doubly checked with the Main Delivery Unit computer data/statistics register. Main outcome measures were compliance to Combined Diabetic Clinic, control of Diabetes with home monitoring. Perinatal mortality rate, congenital fetal anomalies and attitude of patient to pre and post pregnancy counseling were also assessed. Out of 386 women 156 (40.2%) were UAE patients. Grandmultiparity was 16 (4.14%). Highest parity was 16+2. Only 47 (12%) patients started pregnancy with normal BMI while rest were overweight to obese. 322 (83.4%) were compliant to Combined Diabetic Clinic, 358 (92.7%) self-injected with insulin while 325 (84.1%) did home-monitoring. Caesarian section rate was 48.4%. Gross perinatal mortality rate was 22.8/ 1000. 16 babies had congenital anomalies. Contraception was accepted by 46%, and more than 50% defaulted Postnatal Clinic. In conclusion, maternal and perinatal outcome was good, pre pregnancy counseling was difficult as most pregnancies are unplanned, postnatal counseling is more relevant in our setup of diverse ethnic and geographical population .

Key words: *Diabetes, Diabetic pregnancies, insulin*

Introduction
Diabetes occurs in 4/1000 pregnancies in UK.[1] No recent national data is available in UAE/Middle East. Control of blood sugars in early to late pregnancy reduces the risk of congenital anomalies and its impact on delivery and condition of fetus.

Confidential enquiries in maternal deaths (CEMD) 97--99 [2-] showed 4 indirect deaths from diabetes. There has been repeated recommendations that all diabetic pregnancies be looked after by joint diabetic/medical team and pre-pregnancy counseling be available.[3] In our study, we aimed to show the beneficial effects of a joint diabetic/obstetric clinic in maintaining strict control and hence reducing complications. More emphasis needs to be placed on early detection, maintaining euglycaemia in early pregnancy if fetal complications are to be reduced.[4]

Methods
Al Corniche hospital is the largest maternity hospital in UAE, delivering almost 11,500 babies per year. About 5 to 6 % of its delivered population are diabetics. Combined Diabetic Team (Team 0) was started in December 1997. All pregnant patients with risk factors were screened at booking (Table 1). Those requiring insulin at varying gestation periods were transferred to "Team 0". Antepartum, and early postpartum was managed by Team "0'' after which they were transferred back to the original team. At each Clinic visit patients were seen by a senior obstetrician, consultant physician, dietician and the diabetic nurse. Home monitoring was encouraged, use of machine and administration of insulin was taught by a diabetic nurse. Blood sugar series were performed twice weekly and recorded in the note- book provided. In between clinic visits the patient was seen by the diabetic nurse. Stabilization was done on a daycare basis with the diabetic nurse. Patients were admitted only if glycaemic control was poor or they had poor obstetric status. Fetal growth was monitored using growth chart, kick charts, dopplers and cardiotocographic tracing.

Induction of labour was done at 38 to 39 wks depending on cervical favourability and diabetic control. Prostin E2 3mg vaginal tablets 6 to 8 hourly were used. The Audit form was started when the patient first attended the Combined Diabetic Clinic and was completed by doctors after the patient delivered. The audit form was rechecked and all relevant information was compared with the Main Delivery Unit computer/statistics register. The audit form contains comprehensive information including antenatal details, compliance, glycaemic control, intrapartum status and fetal/ neonatal outcome.

Results
A total of 386 insulin-requiring diabetic pregnant patients were identified from Jan 2001 to Dec 2002. There were 8 sets of twins resulting in a total of 394 babies. Of all

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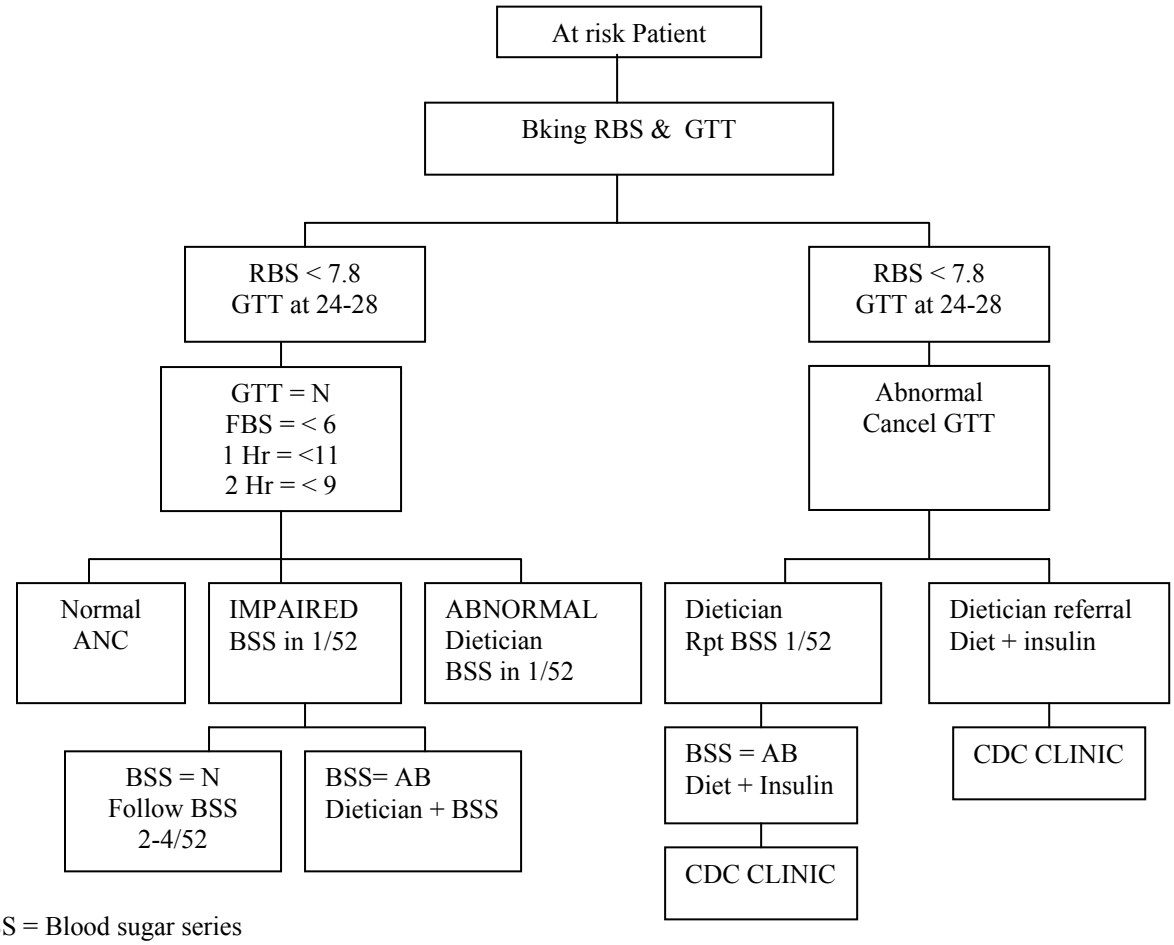
patients 156 (40.2%) were of UAE origin, 76 (20%) were of other Arab origin while 116 (30%) belonged to Asian origin. One patient was < 20 years of age while the majority 234 (60%) were between 31 to 40 years of age. 53 (13.7%) patients were in the 41 to 45 age group. Sixty four were Primigravids (16.5%), while 16 were grand multiparious (4.14%)

Compliancy to Combined Diabetic Clinic was 322 (83.4%). 358 (92.1%) patients performed self-injecting insulin and 325(84.1%) did home monitoring.

Good glycaemic control was seen in 27.9% of patients, while 20.7% were poorly controlled inspite of all efforts. Only 47 (12%) started pregnancy with a Body Mass Index of up to 25, while 77% were overweight to obese and there were 34(8.8%) patients who had BMI > 40.

Seventeen (4.5%) patients had type 1 diabetes while 86 (22.2%) were type 2 diabetics, needing insulin, 70 to 73% had gestational diabetes (Table=2)

Table 1: Flow Chart for patients at risk of diabetes



BSS = Blood sugar series
RBS= Random Blood sugar
ANC= Antenatal Clinic
AB = Abnormal
GTT= Glucose Tolerance Test
CDC= Combined Diabetic Clinic

Table 2: Risk Factors For Screening Gestational Diabetics

Gestational Diabetics	283 (73%)
a. Previous gestational on insulin.	59
b. Previous gestational on diet	42
c. Fetal problem	12
d. Obesity	10
e. High random blood sugar	14
f. Miscarriage	5
g. Family history	99

Table 3: Congenital Anomalies born to Diabetic Mothers

1	UAE	KD2	SB	Congenital abnormality
2	Indian	KD2	SB	Hydrops fetalis
3	UAE	GDM	NND	Dysmorphic features
4	Pakistan	GDM	NND	Congenital abnormality
5	UAE	KD2	NND	Hydrocephaly + haloprosencephaly
6	Indian	KD2	NND	Tr 13 +haloprosencephaly
7	UAE	GDM	NND	Congenital abnormality
8	Iraqi	GDM	ALIVE	Hydrocephaly
9	UAE	KD2	ALIVE	Tr 21 + Congenital Heart Disease
10	UAE	KD2	ALIVE	Dysmorphic
11	UAE	GDM	ALIVE	Congenital Heart/ASD/VSD
12	Syrian	GDM	ALIVE	Cisterna Magna
13	UAE	KD2	ALIVE	Hyrocephaly+ congenital development dorsal/lumbar
14	Sudan	KD2	ALIVE	Congenital Heart Disease
15	UAE	KD2	ALIVE	Dysmorphic +ASD/VSD/Pulmonary atresia
16	UAE	KD1	ALIVE	Chrondroplasia Syndrome

(GDM= gestational diabetic), (KD2= known diabetic type 2), (SB= stillborn), (NND= neonatal death)

Antenatal complications included 33 cases of hyperglycaemia at various gestation periods, 26 cases of hypoglycaemia and 10 cases of Diabetic ketoacidosis. Fifteen patients developed pre-eclampsia while 14 patients started pregnancy with essential hypertension. Seven patients embarked on pregnancy with diabetic nephropathy/retinopathy and needed repeated admission.

In our series 103(26.6%) patients had spontaneous labour while Induction of labour was performed in 137 (35.4%) patients against a background rate of 20 to 22%. Vaginal delivery was achieved in 188 (48.7%) patients. Four patients had vaginal breech deliveries.

Caesarian section rate was 48.4% against a background of 20%. Live Birth was 389 (98.7%). Five babies were stillborn, while four died in early neonatal period. Perinatal Mortality Rate (PMR) was 22.8/1000 against a background rate of 4.05 /1000. Eighty nine babies were admitted to the Neonatal Intensive Care.

There were 16 babies who had various forms of congenital abnormalities (Table=3) 10 of whom were born to Type 2 diabetics and 1 to Type 1. The presence of congenital anomalies stresses the importance of euglycaemia in early weeks of pregnancy.[9]

Discussion

Despite large number of studies, there is no diagnostic index that allows us to identify pregnant diabetic women with a higher risk of a bad outcome[5]. Good glycaemic control attained before 32 weeks and maintained till delivery reduces "Large- for – gestational age" and fetal hypoglycaemia.[6]

In our audited series, patients were referred to us once insulin was started, and a good glycaemic control reduced the perinatal morbidity/mortality but early glycaemic control reduces the rate of congenital anomalies in pregnancy. We had 16 cases of various forms of fetal congenital anomalies which could have been prevented if early and tight diabetic control was initiated.

Caesarian section rate was 48.4% and is comparable to that in other centres.[7] There was no maternal morbidity . 80% of women started pregnancy obese, which is a major problem in this part of the world where people indulge in sedentary lifestyle and high caloric intake. We were able to achieve 83% compliance to the Combined Diabetic Clinic and motivated 92% for home-monitoring with only day-care stabilization. Exercise plays an important role in overcoming peripheral resistance to insulin thus helping diabetic control.[8]

Population based surveys have shown PMR of 36.1/1000 to 42.8/1000 against a background of 7.9/1000.[9] Our PMR was 22.8/1000 against background of 4.05 /1000. Similar rates have been reported in other UK population surveys.[10-11] Our Live- birth rate was 98.7%. There were 5 cases of stillbirth of which 2 had congenital anomalies, 2 were unbooked (came with Intrauterine fetal death) and 1 was an unfortunate case of severe shoulder dystocia (4.01kg).

There were 4 cases of early neonatal deaths of which 3 had lethal abnormalities. 3 cases of late neonatal death of which 2 had congenital anomalies and 1 baby was extremely premature at 26wks (btwt 500gms). Our finding suggests that exemplary care and tight diabetic control during pregnancy cannot compensate for adverse glycaemic state at time of conception.

Most pregnancies are unplanned, family movement between UAE/Gulf is high and formal pre-pregnancy care is difficult to institute. We feel that postnatal counseling and advise before discharge is a better starting point. In our series only 34% took contraception, more than 70% defaulted from postnatal clinic and 4 patients already embarked on their next pregnancy.

It is difficult to say whether the risk factors used in the index pregnancy may be relevant for predicting later diabetes and pregnancy outcome.[12] These issues will be settled by the Hyperglycaemia and Adverse Pregnancy Outcome (HAPO) study.[13-14] The presence of congenital anomalies stresses the importance of euglycaemia in early weeks of pregnancy.[9]

Conclusion

Tight control of blood glucose during pregnancy reduced fetal mortality and morbidity but adverse glycaemic state at the time of conception is a problem. More awareness needs to be generated at discharge for pre pregnancy control if anomalies are to be avoided.

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