Infants of diabetic mothers: an Iraqi Teaching Hospital experience

Numan N. Hameed* **MAAP, MRCPCH, FIBMS, DCH**

Summary:

Background: Despite significantly increased input from multidisciplinary teams during antenatal period, pregnancy outcome from women with type 1, type 2 and gestational diabetes mellitus (DM) remain substantially worse than that of general obstetric population. In Iraq, the true magnitude of infant of diabetic mother (IDM) is not well known as health system has been badly eroded over the period of gulf wars and sanctions.

Objectives: to through a light on IDM in the maternity ward and neonatal care unit (NCU) of Baghdad Teaching Hospital, Medical city complex, Baghdad.

Patients & Methods: A total of 120 IDM admitted to the maternity ward and (NCU) of Baghdad Teaching Hospital, Medical city complex, Baghdad, Iraq, were included in this descriptive study during the period 1st Jan. 2006 to 1st Jan. 2009. A questionnaire was filled for each neonate, which included maternal and neonatal information. Results were presented in frequencies. Multiple logistic regression was done to identify factors associated with death of IDM.

Results: Gestational diabetes was the common type (60.8%), cesarean section was a common mode of delivery (81.7%) and (84.2%) of mothers got antenatal care visits. Regarding the neonates, prematurity was observed in (26.7%), macrosomia in (26.7%), hypoglycemia in (56.8%), hyperbilirubinaemia in (26.1%),congenital anomalies in (12.5%) and Sepsis in (11.4%) of the neonates. Mode of delivery and prematurity significantly affect the death of neonates (p = 0.036 and 0.0008), while parity, type of DM, and birth weight were not significantly affecting the outcome of IDM.

Conclusions: High rates of hypoglycemia , Hyperbilirubinemia, prematurity, congenital anomalies and macrosomia were reported. The mode of delivery and prematurity significantly affect the death of IDM. Better perinatal care of mothers and their IDM with tighter preconceptual glycemic control is likely to reduce the prevalence of reported complications and death and improve the outcome for IDM.

Keywords: Infant, diabetic mothers, Iraq

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Introduction:

Despite significantly increased input from multidisciplinary teams during antenatal period, pregnancy outcome from women with type 1, type 2 and gestational diabetes mellitus (DM) remain substantially worse than that of general obstetric population (1). Prior to 1990, Iraq was advancing through the epidemiological transition from infectious diseases to chronic and degenerative diseases, while the country currently suffers from a double burden (2). In Iraq, the true magnitude of infant of diabetic mother (IDM) is not well known as health system has been badly eroded over the period of gulf wars and sanctions (2, 3). The impetus to carry out this study was to through a light on IDM in the maternity ward and neonatal care unit (NCU) of Baghdad Teaching Hospital, Medical city complex, Baghdad.

Materials and methods:

A total of 120 neonates admitted to the maternity ward and neonatal care unit (NCU) of Baghdad Teaching Hospital, Medical city complex, Baghdad, Iraq, were included in this descriptive study. It was for the period 1st Jan. 2006 to 1st Jan. 2009. This Hospital contains 50 beds for maternity ward and the NCU contains 12 incubators. The study included all neonates of mothers with pre-gestational diabetes mellitus (PGDM) and gestational diabetes mellitus (GDM), who were admitted to maternity ward for labor. A questionnaire was filled for each neonate. The questionnaire included maternal and neonatal information. Maternal data were age, parity, duration of DM, type of DM, treatment (diet, insulin or both), antenatal care visits (ANC) and mode of delivery (normal vaginal delivery or cesarean section). Neonatal data consist of sex, gestational age (preterm, term or post-term), birth weight (normal birth weight, low birth weight or macrosomia), admission to NCU, cause of admission to NCU (prematurity, birth asphyxia, hypoglycemia, hyperbilirubinemia, sepsis, congenital anomalies and others) and outcome (dead or discharged well). Results were presented in frequencies. Multiple logistic regressions were done to identify factors associated with death of IDM. P value of < 0.05 was considered significant.

Results:

Table 1, 2 shows the maternal and neonatal characteristics of the studied sample. Gestational diabetes was the common type (60.8%), cesarean

*College of Medicine, Baghdad University, and Children Welfare Teaching Hospital, Medical City Complex.

section was a common mode of delivery (81.7%) and most of mothers got antenatal care visits (84.2%). Regarding the neonates, prematurity was observed in (26.7%), macrosomia in (26.7%), hypoglycemia in (56.8%), hyperbilirubinaemia in (26.1%) and congenital anomalies in (12.5%). Sepsis was noticed in (11.4%) of the neonates. Mode of delivery and prematurity significantly affect the death of neonates (p = 0.036 and 0.0008), while parity, type of DM, and birth weight were not significantly affecting the outcome of IDM. These findings are shown in Table 3.

Table 1: The maternal and neonatal characteristics of the studied sample

Variable		No.	%
Parity			
	Multipara	99	82.5
	Primipara	21	17.5
Mode of delivery			
	C/S	98	81.7
	NVD	22	18.3
Type of DM			
	GDM	73	60.8
	Pre-gestational DM	47	39.2
ANC		101	84.2
Gestational age			
	Full term	88	73.3
	Preterm	32	26.7
Sex			
	Male	51	42.5
	Female	69	57.5
Birth weight			
	LBW	12	10.0
	NBW	76	63.3
	Macrosomia	32	26.7

Table 2: The frequency distribution of complications of infants of diabetic mothers

Complication	Number	Percent %
Hypoglycemia	50	56.8
Hyperbilirubinemia	23	26.1
Respiratory distress syndrome	21	23.9
Birth asphyxia	12	13.6
Congenital anomalies	11	12.5
Sepsis	10	11.4
Polycythemia	7	8.0
Hypocalcaemia	6	6.8
Others	6	6.8

Table 3: The effect of maternal and neonatal characteristics on neonatal deaths

Variable		OR	P value
Parity		47	0.33
Type of DM		1.9	0.5
Management			
	Diet	1.8	0.58
	Drug + diet	2.6	0.34
	No intervention	5.4	0.33
NVD		7.2	0.036
Preterm		9.2	0.0008
Birth weight		2.2	0.44

Discussion:

Neonatal hypoglycemia is a frequent event in the first hours of life of IDM. The reported rate (56.8%) is higher than that in literature (4-6). (27%). The difference might be attributed to poor maternal metabolic control. Several workers (7, 8) documented poor metabolic control of DM in Iraq. They attributed that to the deterioration in the health system. The rate of prematurity in this study was (26.7%). It is consistent with that of other studies (4, 9, and 10). Previous report from Iraq showed a significant association between preterm delivery and maternal DM (11, 12). This study showed that the rate of congenital anomalies was (12.5%). It is similar to that reported in literature (4). (13.4%). It showed a positive correlation between poor maternal metabolic control and the rate of fetal malformation (4, 10). The fetal congenital malformations could be prevented only by strategies introduced prior to pregnancy [1]. In Iraq, several workers documented the poor glycemic control. (7, 8) The rate of macrosomia was (26.7%) which is lower than that reported in Netherland (45.1%) (13) and Spain (31%) (5). Macrosomia or fetal obesity is a frequent complication of pregnancy in DM (13, 14). In Oman, (14) which provides comprehensive care for detection and management of DM during pregnancy with the goal of reducing or eliminating adverse outcome for mothers and neonates, a research indicates that macrosomia is a common outcome in diabetic pregnancies. On other hand, Hasanein SR et al (2004) (15) reported that anthropometric measurements of infants with well controlled gestational DM do not differ from infants of non diabetic mothers. Hyperbilirubinemia was found in (26.1%) and this is in agreement with Leandro L et al study (1998), (25%) Similar to other studies (16), the rate of respiratory distress syndrome (RDS) was (23.9%). Sepsis was found in (11.4%). This finding might be attributed to high prevalence of hospital acquired infection in Iraq (16-17). In this study, normal vaginal delivery and preterm delivery were risk factors for death of IDM. This finding might be explained by the fact that the use of invasive procedures (cannula, intravenous set, nasogastric tube, and suction and O_2 therapy) increases the risk of infection in many ways (15) and the high prevalence of hospital acquired infection (17-19).

Conclusions:

High rates of hypoglycemia, Hyperbilirubinemia, prematurity, congenital anomalies and macrosomia were reported. The mode of delivery and prematurity significantly affect the death of IDM. Better perinatal care of diabetic mothers and their newborn infants with tighter and better preconceptual glycemic control is likely to reduce the prevalence of reported complications and death and improve the outcome for IDM.

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