ISSN: 2230-9926

*Available online at http://www.journalijdr.com*

IJDR

*International Journal of Development Research*
*Vol. 09, Issue, 03, pp.26596-26598, March, 2019*


**ORIGINAL RESEARCH ARTICLE** **OPEN ACCESS**

# HEMATOLOGICAL PROFILE IN INFANTS OF DIABETIC MOTHERS KING FAHAD HOSPITAL-NICU-ALBAHA

**[1]Dr. Jameel Mohammed Alghamdi and *[2]Elsharif. A. Bazie**

[1]Albaha University, Saudi Arabia
[2]King Fahad Hospital-Albaha, Saudi Arabia

**ARTICLE INFO**

***Article History:***
Received 20th December, 2018
Received in revised form
16th January, 2019
Accepted 10th February, 2019
Published online 31st March, 2019

***Key Words:***
Hemoglobin, Packed Cell Volume, Platelets, Infant of Diabetic mother.

**ABSTRACT**

Polycythaemiaoccurs more frequently at birth in infants of diabetic mothers.The exact mechanism polycythaemia in neonates still unidentified also many studies have shown that increased erythropoiesis in infants born to diabetic mothers might be related to intrauterine hypoxia, due to hyperinsulinism and hyperglycaemia. There are 7 neonates (25.9%) with low heamoglobin(Hb) and 17 neonates (63%) with normal Hb and 3 neonates(11.1%) with high Hb. In conclusion uncontrolled blood glucose during pregnancy is the leading causes to polycythemia and macrosomia.



**Citation: Dr. Jameel Mohammed Alghamdi and Elsharif. A. Bazie, 2019.** "Hematological profile in infants of diabetic mothers king fahad hospital-nicu-albaha", *International Journal of Development Research*, 09, (03), 26596-26598.

## INTRODUCTION

Diabetes mellitus (DM) is an important metabolic disturbance influencing carbohydrate, lipid and protein metabolism, during pregnancy, (Cunningham *et al.,* 2001). Polycythaemia occurs more frequently at birth in infants of diabetic mothers, with 3 − 5 times increased the risk for hyperviscosity, renal vein thrombosis, cardiac failure and necrotizing enterocolitis. The exact mechanism polycythaemia in neonates still unidentified also many studies have shown that increased erythropoiesis in infants born to diabetic mothers might be related to intrauterine hypoxia, due tohyperinsulinism and hyperglycaemia, (Di Cianni *et al.,* 2003). Bard and Prosmanne18 found that infants born to diabetic mothers synthesized significantly higher levels of fetal haemoglobin (HbF), compared with infants born to non-diabetic controls, (Bagby *et al.,* 1994). Poor glycemic control before and in the first trimester of pregnancy is related to spontaneous abortions, early growth delay, and major congenital malformations, (Brown *et al*., 1992). During the second trimester, preterm labor and delivery, (Mimouni *et al*., 1988) and minor congenital anomalies, (Rosenn *et al.,* 1990). During the third trimester of pregnancy, it is predictive of macrosomia, (Berk *et al.,* 1989). Hyperinsulinism like neonatal hypoglycemia, (Sosenko *et al.,* 1982). Respiratory distress, (*Robert et al.,* 1976), cardiac Birth trauma, fetal dystocia, (Mimouni *et al.,* 1992). Maternal trauma and high cesarean deliveryrate, (Miodovnik *et al.,*1987). Uncontrolled diabetes during pregnancy leads to complications linked to fetal Asymmetric Septal Hypertrophy (ASH),(Breitweser *et al.,* 1980), neonatal hypoxemia will lead to acute, (Mimouni *et al*., 1988) or chronic complications such as neonatal polycythemia, (Green *et al.,* 1992)or thrombocytopenia, (Green *et al.,* 1995). Hyperglycemia in labor aggravates the risk of neonatal hypoglycemia and is associated with lowered Apgar scores (9). In infants of diabetics mother symptoms and signs of polycythemia are unlikely to be found in a hematocrit of < 65%. partial exchange transfusion[PET] and its efficacy have not been demonstrated when PET is conducted after 6 hours of life in asymptomatic infants. Thus, routine screening for neonatal polycythemia [NP] is not recommended, as well as a routine PET in asymptomatic infants. Screening for symptoms and for neonatal hypoglycemia [NH] should be performed carefully and documented in all infants with polycythemia. IDM's with significant NP and persistent NH, also those with symptoms of NP should undergo PET, (Mimouni *et al*., 2011).

## MATERIALS AND METHODS

This study was conducted in neonatal intensive care unit (NICU) at King Fahad Hospital-ALBAHA during the period

***Corresponding author:*** **Elsharif Ahmed Bazie,**
King Fahad Hospital-Albaha, Saudi Arabia

from January 2017 to June 2018. All infant delivered to diabetic mother admitted to the NICU were enrolled in the study. Weight was measured to all admitted neonates and classification to Average for Gestational Age (AGA), Small for Gestational Age (SGA) and Large for Gestational Age (LGA) was done according to the centile charts of weight to length. Infants born at the 90 percentile for age (gestational age) are considered LGA while babies born between 10 to 90 percentile Institute, were considered AGA and less than 10 percentile as SGA. Complete blood count (CBC) was done for all enrolled neonates at time. We concentrate on hemoglobin level, packed cell volume (PCV) and platelets count.

## RESULTS

We studied 27 neonates to mothers with diabetes mellitus, all of them admitted to King Fahad Hospital Intensive Care Unit (NICU). Seventeen neonates (63%) were delivered by emergency caesarian section, 9 neonates (33.3%) were delivered by elective caesarian section and one neonate was delivered by spontaneous vaginal delivery, Figure [1]. Those who delivered with average for gestational age(AGA) were 20 neonates (74.1%), large for gestational age (LGA)were 6 neonate (22.2%) and small for gestational age(SGA) was one neonate (3.7%), Figure [2]. Sixteen neonates (59.3%) were delivered preterm and 11 neonates (40.7%) were delivered term. Figure [3] Figure [4] showed that 10 neonates (37%) givensurfanta and needs mechanical ventilation, 9 neonates (33.3%) given surfanta and needs CPAP, 3 neonates(11.1%) need only CPAP, 3 neonates(11.1%) given surfanta only and 2 neonates (7.4%) did not need any respiratory support.

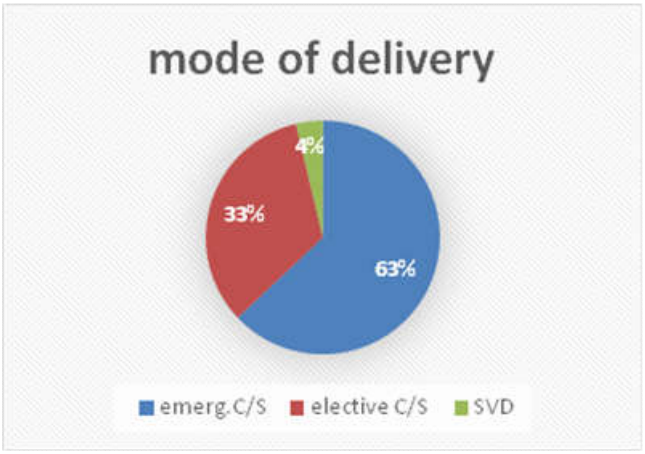


**Figure 1.**

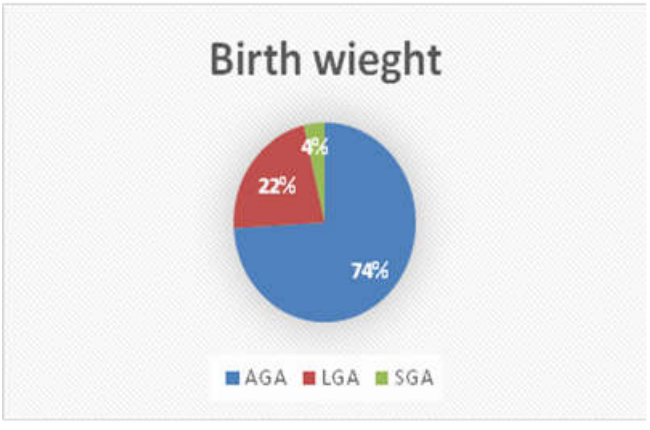


**Figure 2.**

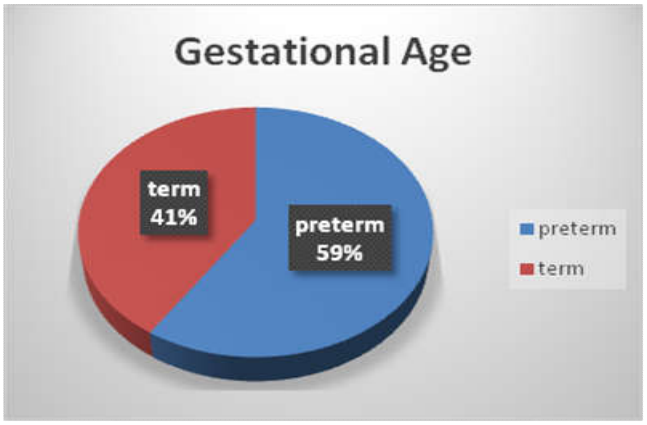


**Figure 3**

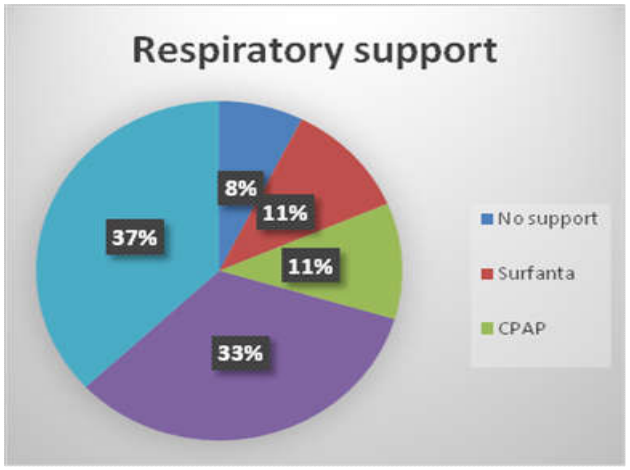


**Figure 4.**

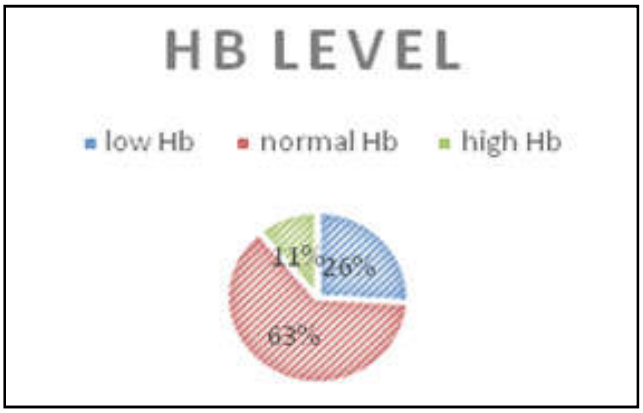


**Figure 5**

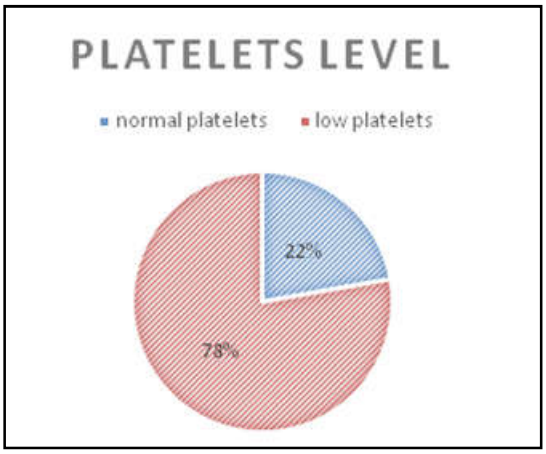


**Figure 6.**

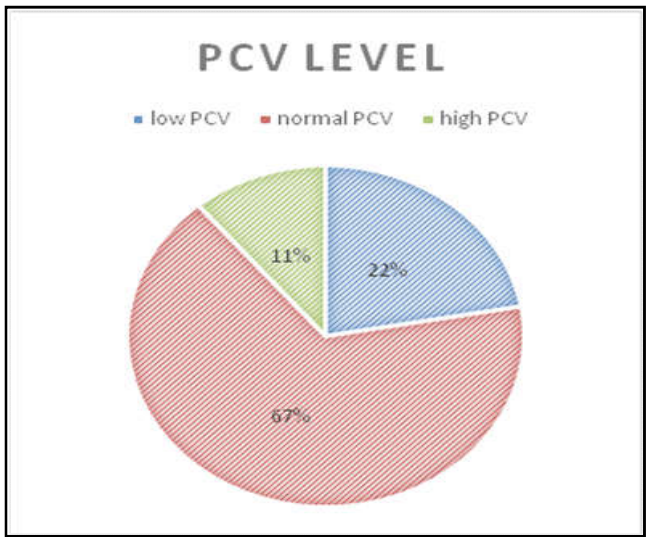


**Figure 7.**

## DISCUSSION

Polycythaemia is an important problem that is observed in some infants born to diabetic mothers: fetal hyperinsulinaemia and elevated Erythropoietin levels, due to intrauterine chronic hypoxia, may cause polycythaemia in infants delivered to diabetic mothers. We studied 27 neonates delivered to mothers with diabetes mellitus during pregnancy, in our study polycythemia ( i.e packed cell volume of more than 65%) was found in 11% of our study group. Mimouni F, *et al*, (18) they had polycythemia in 29.4% and significant macrosomia, Also in a study done by Cetin H *et al*(19), polycythemia was significant in their neonates admitted to their NICU and delivered to diabetic mothers during pregnancy. We found macrosomia in 11%, while Jeanne L. Ballard *et al.,* 1993, in their study they found that 45% had macrosomia and mainly due to uncontrolled diabetes during pregnancy. Michael A. Berk *et al.,* (21) their study showed large for gestational age(LGA) was 26.9% in infants of diabetic mothers and it was due to unc ontrolled blood glucose during pregnancy. In conclusion uncontrolled blood glucose during pregnancy is the leading causes to polycythemia and macrosomia.

## REFERENCES

Bagby, G.C. 1994. Hematopoiesis. In: The Molecular Basis of Blood Disorders, 2nd edn. (Stamatoyannopulos G, Nienhuis AW, MajerusP, *et al*, eds). Philadelphia: WB Saunders, pp 321 – 378.

Ballard JL, Rosenn B, Khoury JC, Miodovnik M. Diabetic fetal macrosomia: significance of disproportionate growth. J Pediatr. 1993 Jan;122(1):115-9.

Berk MA, Mimouni F, Miodovnik M, Hertzberg V, Valuck J 1989. Macrosomia in infants of insulin-dependent diabetic mothers. Pediatrics 83: 1029-1034.

Breitweser, J.A., Meyer, R.A., Sperling, M.A., Tsang, R.C., Kaplan, S. 1980. Cardiac septal hypertrophy in hyperinsulinemic infants. J Pediatr 96: 535-539.

Brown, Z.A., Mills, J.L., Metzger, B.E., Knopp, R.H., Simpson, J.L., *et al*. 1992. Early sonographic evaluation for fetal growth delay and congenital malformations in pregnancies complicated by insulin-requiring diabetes. National Institute of Child Health and Human Development Diabetes in Early Pregnancy Study. Diabetes Care 15: 613-619.Cetin, H. 2011. Polycythaemia in infants of diabetic mothers: β-hydroxybutyrate stimulates erythropoietic activity. J Int Med Res., 39(3):815-21

Cunningham, F.G., Gant, N.F., Leveno, K.J., *et al*. 2001. (eds): Diabetes. In: Williams Obstetrics, 21st edn. New York: McGraw-Hill, pp 1359 – 1382.

Di Cianni G, Miccoli R, Volpe L, *et al*: 2003. Intermediate metabolism in normal pregnancy and in gestational diabetes. Diabetes MetabResRev., 19: 259 – 270.

Green, D.W., Khoury, J., Mimouni, F. 1992. Neonatal hematocrit and maternal glycemic control in insulin-dependent diabetes. J Pediatr 120: 302-305.

Green, D.W., Mimouni, F., Khoury, J. 1995. Decreased platelet counts in infants of diabetic mothers. Am J Perinatol., 12: 102-105.

Jeanne L. Ballard *et al*; Diabetic fetal macrosomia: Significance of disproportionate growth, The journal of pediatrics. January 1993Volume 122, Issue 1, Pages 115–119

Michael A. Berk. 1989. Macrosomia in Infants of Insulin-Dependent Diabetic Mothers; Pediatrics. June 1989, VOLUME 83 / ISSUE 6I

Mimouni F, Miodovnik M, Rosenn B, Khoury J, Siddiqi TA 1992. Birth trauma in insulin-dependent diabetic pregnancies. Am J Perinatol., 9: 205-208.

Mimouni, F. *et al*., 2011. Neonatal polycythemia in infants of insulin-dependent diabetic mothers. J Int Med Res.., 39(3):815-21

Mimouni, F., Miodovnik, M., Siddiqi, T.A., Berk, M.A., Wittekind, C. *et al*. 1988. High spontaneous premature labor rate in insulin-dependent diabetic pregnant women: an association with poor glycemic control and urogenital infection. ObstetGynecol., 72: 175-180.

Mimouni, F., Miodovnik, M., Siddiqi, T.A., Khoury, J., Tsang, R.C. 1988. Perinatal asphyxia in infants of insulin-dependent diabetic mothers. J Pediatr 113: 345-353.

Mimouni, F.B., Merlob, P., Dollberg, S., Mandel, D. 2011. Neonatal polycythemia: critical review and a consensus statement of the Israeli Neonatology Association. ActaPaediatrScand 52: 497-512.

Miodovnik M, Mimouni F, Tsang RC, Skillman C, Siddiqi TA, *et al*. 1987. Management of the insulin-dependent diabetic during labor and delivery. Influences on neonatal outcome. *Am J Perinatol.,* 4: 106-114.

Robert, M.F., Neff, R.K., Hubbell, J.P., Taeusch, H.W., Avery, M.E. 1976. Association between maternal diabetes and the respiratory-distress syndrome in the newborn. *N Engl J Med.,* 294: 357-360.

Rosenn B, Miodovnik M, Dignan PS, Siddiqi TA, Khoury J, *et al*. 1990. Minor congenital malformations in infants of insulin-dependent diabetic women: association with poor glycemic control. ObstetGynecol 76: 745-749.

Sosenko, J.M., Kitzmiller, J.L., Fluckiger, R., Loo, S.W., Younger, D.M., *et al*. 1982. Umbilical cord glycosylated hemoglobin in infants of diabetic mothers: relationships to neonatal hypoglycemia, macrosomia, and cord serum C-peptide. Diabetes Care 5: 566-570.

Widness, J.A., Susa, J.B., Garcia, J.F., *et al*: 1981. Increased erythropoiesis and elevated erythropoietin in infants born to diabetic mothers in hyperinsulinemic rhesus fetuses. *J Clin Invest.,* 67: 637 – 642.

*******