www.jmscr.igmpublication.org Impact Factor 3.79
ISSN (e)-2347-176x

Journal Of Medical Science And Clinical Research
IGM Publication An Official Publication Of IGM Publication

Influence of Abnormal GCT with Normal or Impaired OGTT on Neonatal Outcome

Authors

Anupama Suresh Y[1], Suresh Y V[2], Achira Chaturvedi[3]

[1]DGO,DNB- Associate Professor, Department of OBG,Kasturba Medical College, Mangalore, A Unit of Manipal University

[2]MD (Anaesth), Associate Professor; Department of Anaesthesiology, Kasturba Medical College, Mangalore, A Unit of Manipal University

[3]MD (OBG), Senior Resident, Department of OBG, Kasturba Medical College, Mangalore, Unit of Manipal University

Corresponds Authors

Dr.Anupama Suresh Y

Flat no.203, Divya Enclave M.G.Road,Kodialbail Mangalore 575 003 Karnataka

Email: *dranupamasureshy@yahoo.co.in*

ABSTRACT

The screening test for diabetes mellitus during pregnancy is done for all the pregnant women by Glucose Challenge Test (GCT) and if raised oral Glucose Tolerance Test (OGTT) is done. In this study, single elevated 100gm OGTT value associated with adverse effects on the neonate outcome like ,large for gestational & hyperbilirubinemia . we have studied 500 pregnant women with 50gm GCT and if the glucose level is high (140mg/dl) are considered as positive and OGTT were done with 100gm glucose. The result of our cohort study suggest that having a positive GCT is an independent risk factor for adverse neonatal outcome like large for gestational age 2.2% in normal GTT group in compared to 10.8% in impaired GTT group, and hyperbilirubinemia were significantly high in those patients .

Key Words: *GTT, impaired OGTT, large for gestational age, hyperbilirubinemia*

INTRODUCTION

Patients with pre gestational and Gestational Diabetes Mellitus (GDM) are at increased risk for adverse neonatal outcome. The abnormal glucose metabolism during pregnancy may lead to various types of adverse outcome of both

mother and fetus. Screening for DM during pregnancy is performed in all pregnancies. In India the prevalence is 7% in OGCT and 6% in OGTT(1,5,6) Screening for diabetes mellitus during pregnancy is done for all pregnant women by GCT If the GCT is high, then OGTT is done.(3)The diagnosis of gestational diabetes is done if two out of four thresh hold values are met or exceeded. (1,3,4). In this study , a single elevated 100gm OGTT value was studied with fetal outcome.

AIM:

To evaluate the outcome of patient who has raised GCT results and subsequent normal or impaired OGTT results .and to assess the risk for perinatal outcome

Methods:

After getting clearing from Hospital Ethics committee, 500 singleton pregnant patient were selected randomly. Known history of diabetes mellitus were excluded.

All patients between 24 and 28 weeks of gestation were screened with 50gm GCT of whom 436 showed a plasma glucose level of more than 140mgm/dl and were determined positive and subsequently underwent 100gm OGTT. The patient who were completed the study were 410. Others were either lost in the follow up or not come for delivery to our institution.

410 study patients were divided in to three groups. Group 1- No elevated group(High GCT value) with all four normal l00gm OGTT values, Group 2a- Elevated FBS -33, Groups2b (with one elevated 100gm OGTT value) -1st hr No- 53, 2nd hr No -44 , 3rd hr No- 38 ,

Glucose Challenge Test (GCT):

The 50gmGCT was performed between 24 and 28weeks of gestation regardless of prior food intake by administering 100ml of 50% D-glucose with 200ml of water only. The oral consumption of food intake and exercise was restricted for the following hour, after which venous blood sampling was performed for plasma glucose level measured by glucose oxidase method. Those patient who showed a 50g GCT level of more than 140mg/dl further investigated by OGTT at 28 to 32 weeks.

The 100gm OGTT was performed by instructing the patient to keep nil per oral for 8 hrs prior to the test from midnight of the day before.

A blood sample was taken in the morning for a fasting plasma level followed by drinking 200ml of D-glucose with100ml of water. Three additional samples were then taken at 1hr,2hr and 3hr after glucose intake.

The medical record of each patient was reviewed for obstetrical characteristics like the incidence of pre eclamsia, preterm delivery, fetal distress etc. The incidents were compared between the two groups (group 1, and 2)

Results:

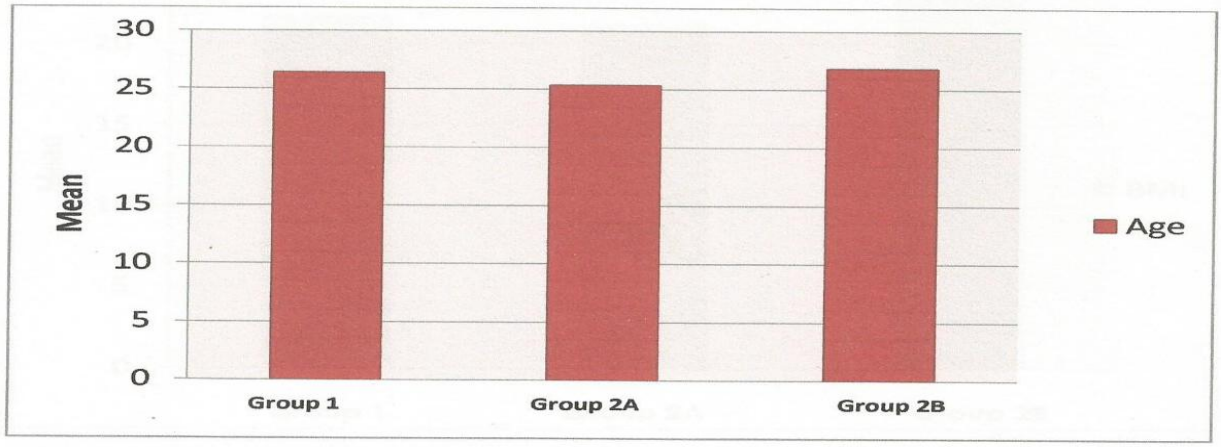
The results are statistically compared using chi square test and annova test.

OBSERVATION AND ANALYSIS

Age	N	Mean	Std Deviation	ANOVA F Value	P value
Group 1	232	26.39	3.64	2.14	NS .119
Group 2A	33	25.36	3.79		
Group 2B	130	26.82	3.63		

P Value 0.12 (Not significant)

The age pattern of impaired GTT and abnormal GCT and normal GTT is same.



The age pattern of impaired GTT and abnormal GCT and normal GTT is same.

P value 0.12 not significant.

Table 1 and Diagram 1

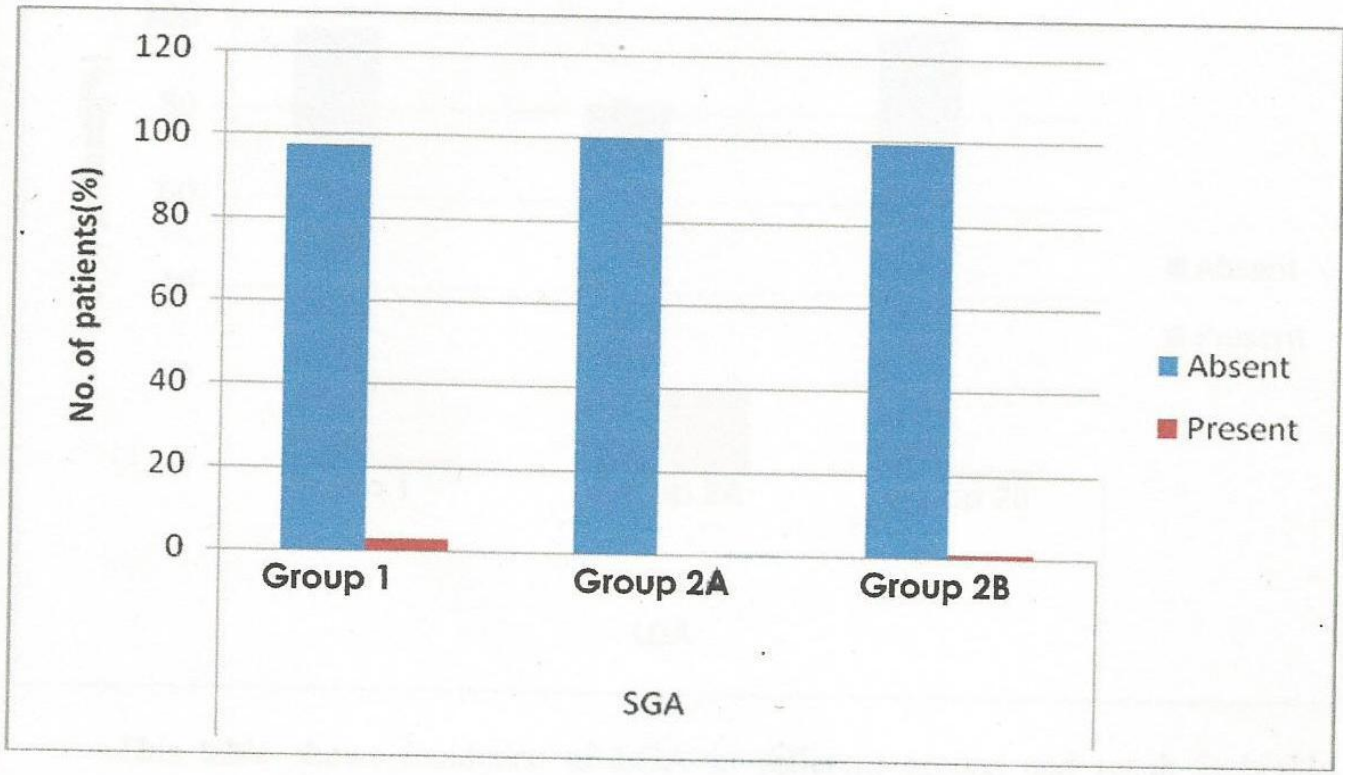
There is no significant differences in age in all the three groups mean age being 26.39 in Group 1,25.36 in Group 2a and 26.82 in Group 2b

Neonatal Complications

SGA	Group 1	Group 2a	Group 2b
Absent	226(97.4%)	33(100%)	129(99.2%)
Present	6(2.6%)	0(0%)	1(.8%)

Fishers exact test p=.576, NS

This table shows incidence of small for gestational age babies different. Groups and result is not significant.



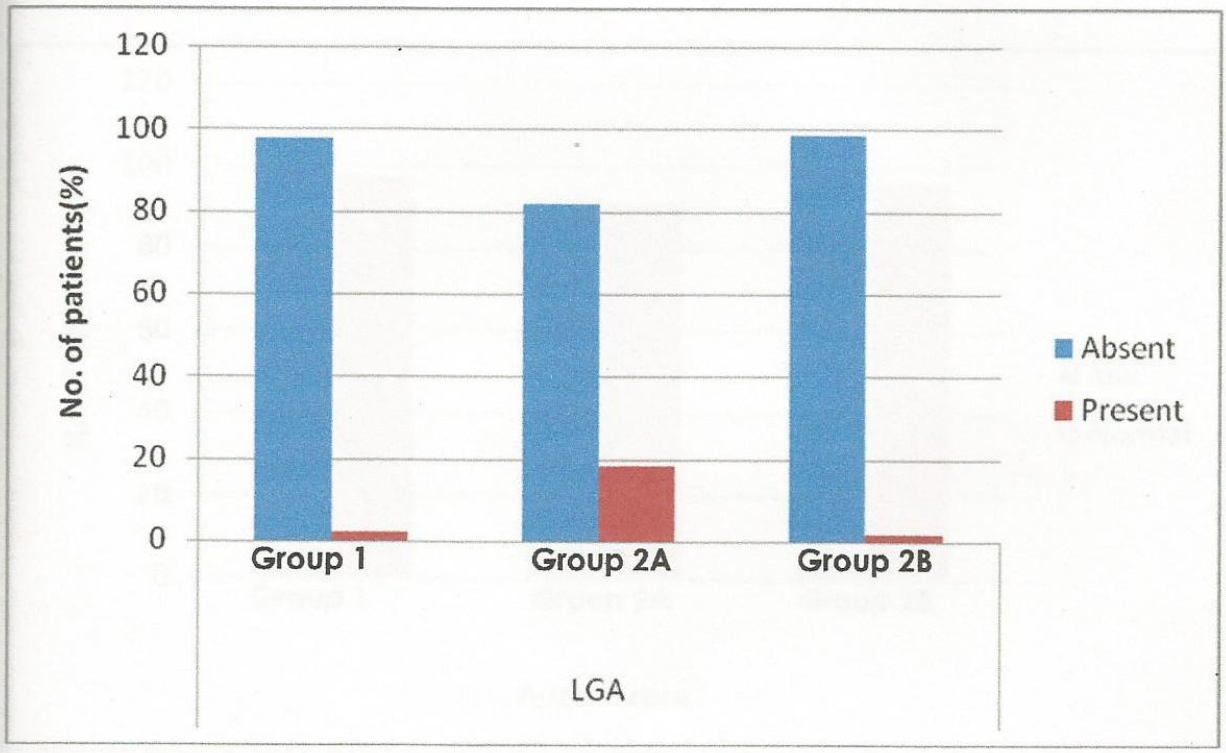
This diagram shows incidence of SGA in different groups. Result is not significant

Table 2 & Diagram 2

LGA	Group 1	Group 2a	Group 2b
Absent	227(97.8%)	27(81.8%)	128(98.5%)
Present	5(2.2%)	6(18.2%)	13(3.3%)

Fishers exact test p=.001, HS

This table shows incidence of large for gestational age in different groups. Result is highly significant,



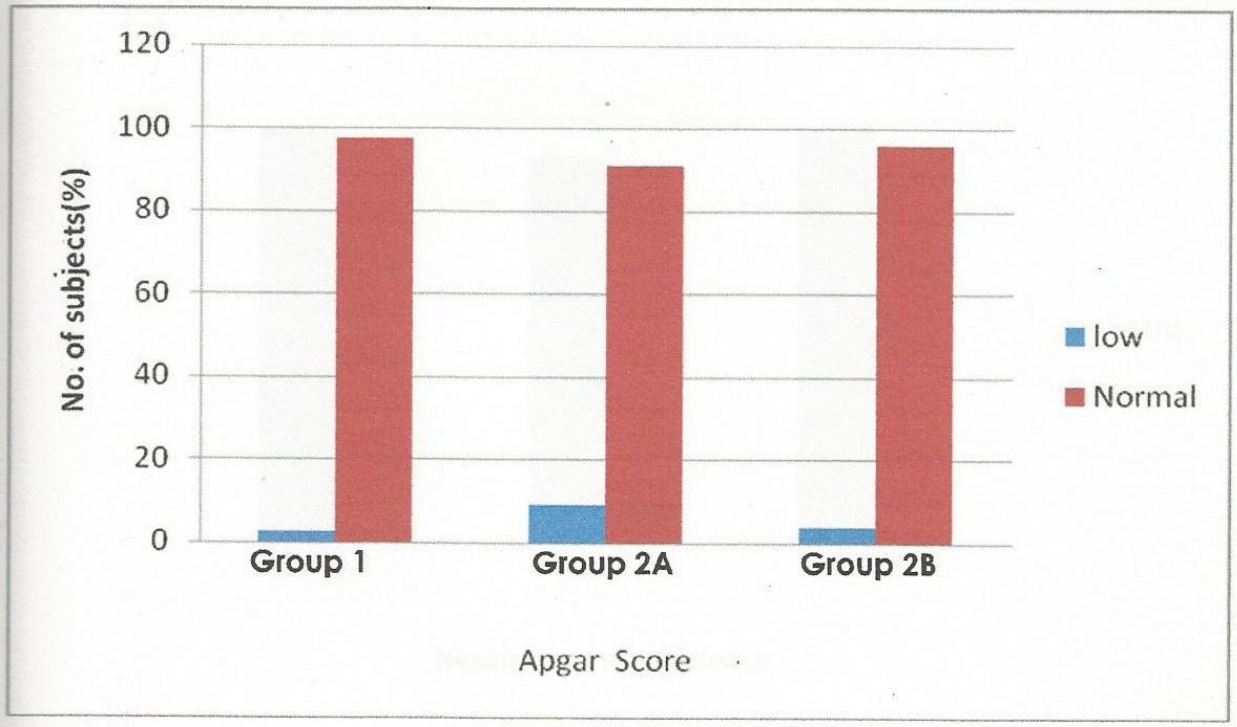
This table shows incidence of LGA in different groups and result is highly significant.

Table 3,Diagram 3

Apgar Score	Group 1	Group 2a	Group 2b
Low	6(2.6%)	3(9.1%)	5(3.8%)
Normal	226(97.4%)	30(90.9%)	125(96.5%)

Fishers exact test p=.137, Ns

This table shows difference in APGAR scores in different groups. Result is not significant.



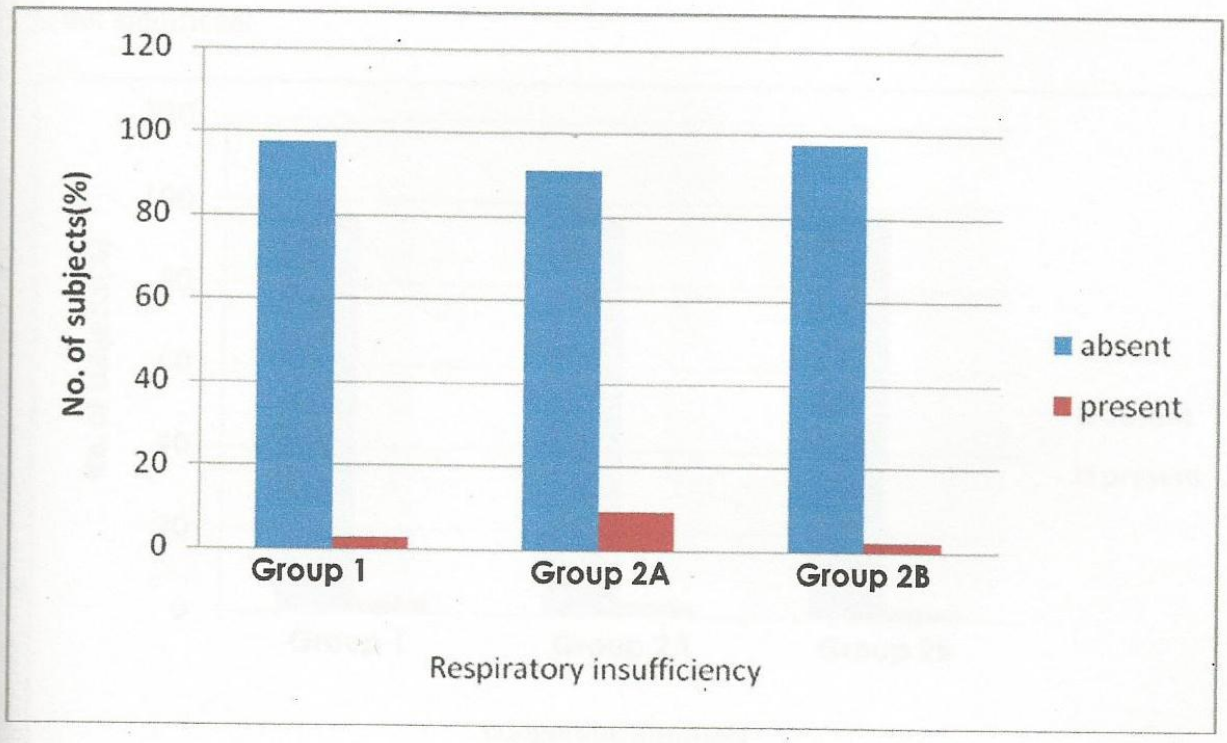
This table shows difference in APGAR scores in different groups and result is not significant

Table 4 & Diagram 4

Respiratory Insufficiency	Group 1	Group 2a	Group 2b
Absent	226(96.6%)	32(97%)	127(97.7%)
Present	8(3.4%)	1(3%)	3(2.3%)

Fishers exact test p=.132, Ns

This table shows incidence of respiratory insufficiency in different groups. And result is not significant.



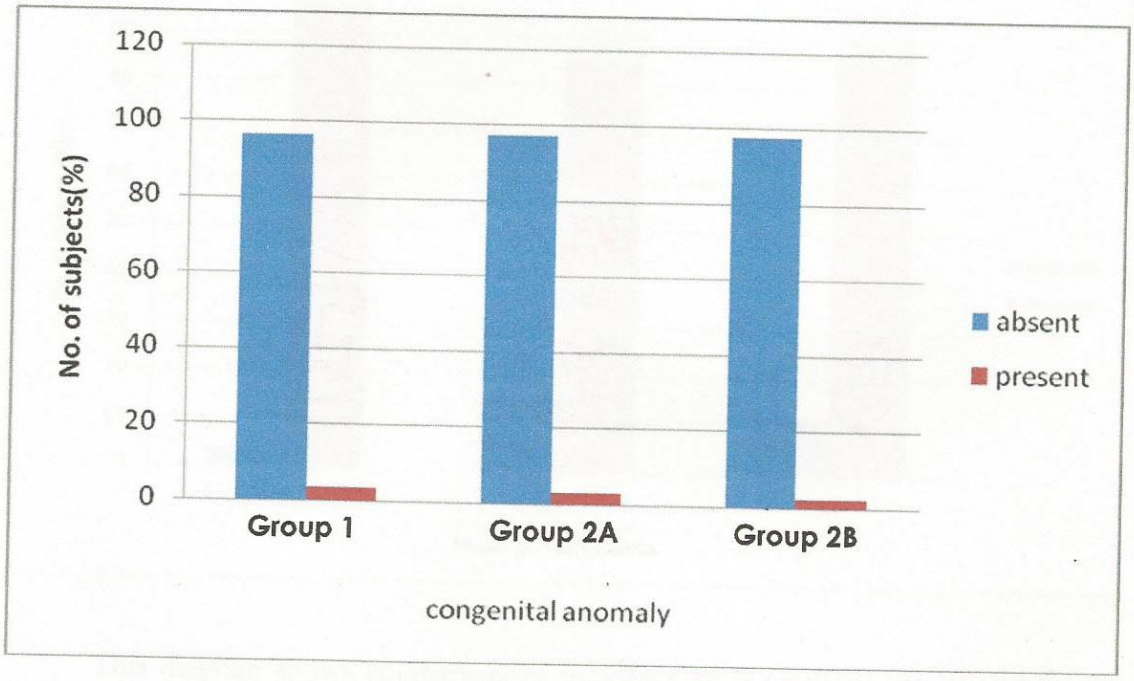
This table shows incidence of respiratory insufficiency in different groups and result is not significant.

Table 5 & Diagram 5

Congenital Anomaly	Group 1	Group 2a	Group 2b
Absent	224(96.6%)	32(97%)	127(97.7%)
Present	8(3.4%)	1(3%)	3(2.3%)

Fishers exact test p=.902, Ns

This table shows incidence of congenital anomalies in different groups and Result is not significant



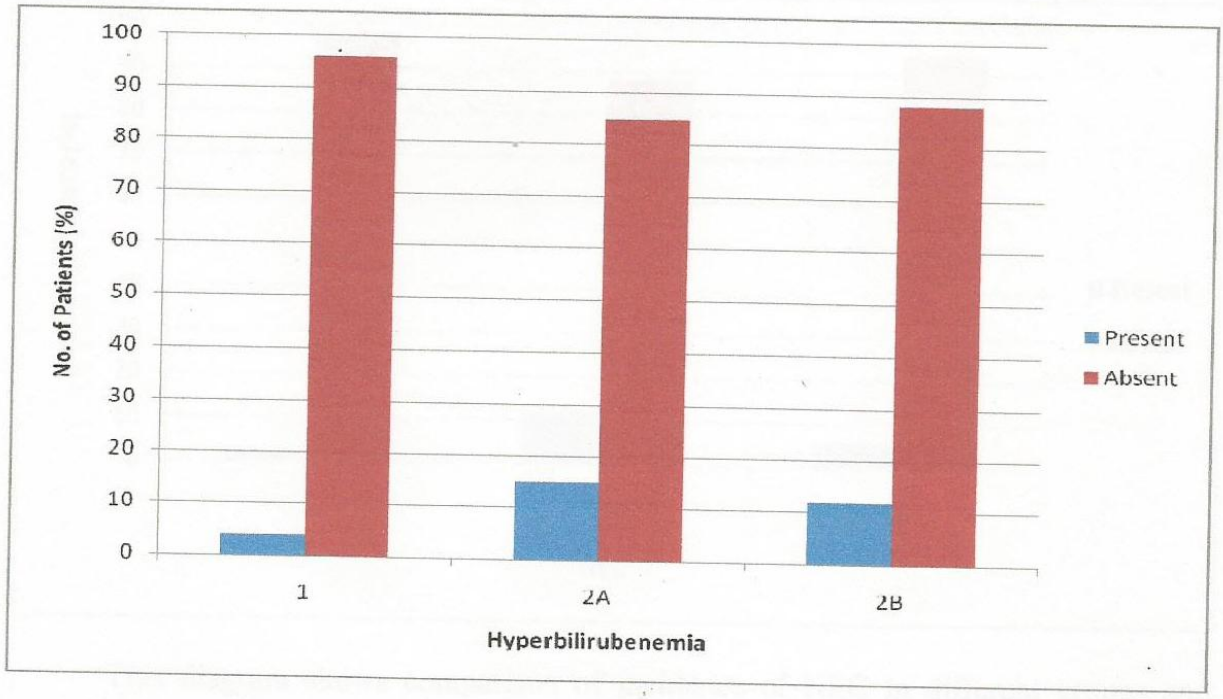
This table shows incidence of congenital anamolies in different groups and Result is not significant

Table 6 Diagram 6

Hyperbilirubenemia	Group 1	Group 2a	Group 2b
Absent	222(96%)	28(55%)	127(97.7%)
Present	10(4%)	5(15%)	15(12%)

X2 =9.13, p=.010, S

This table shows incidence of hyperbilirubenimia in different groups and Result is statically significant

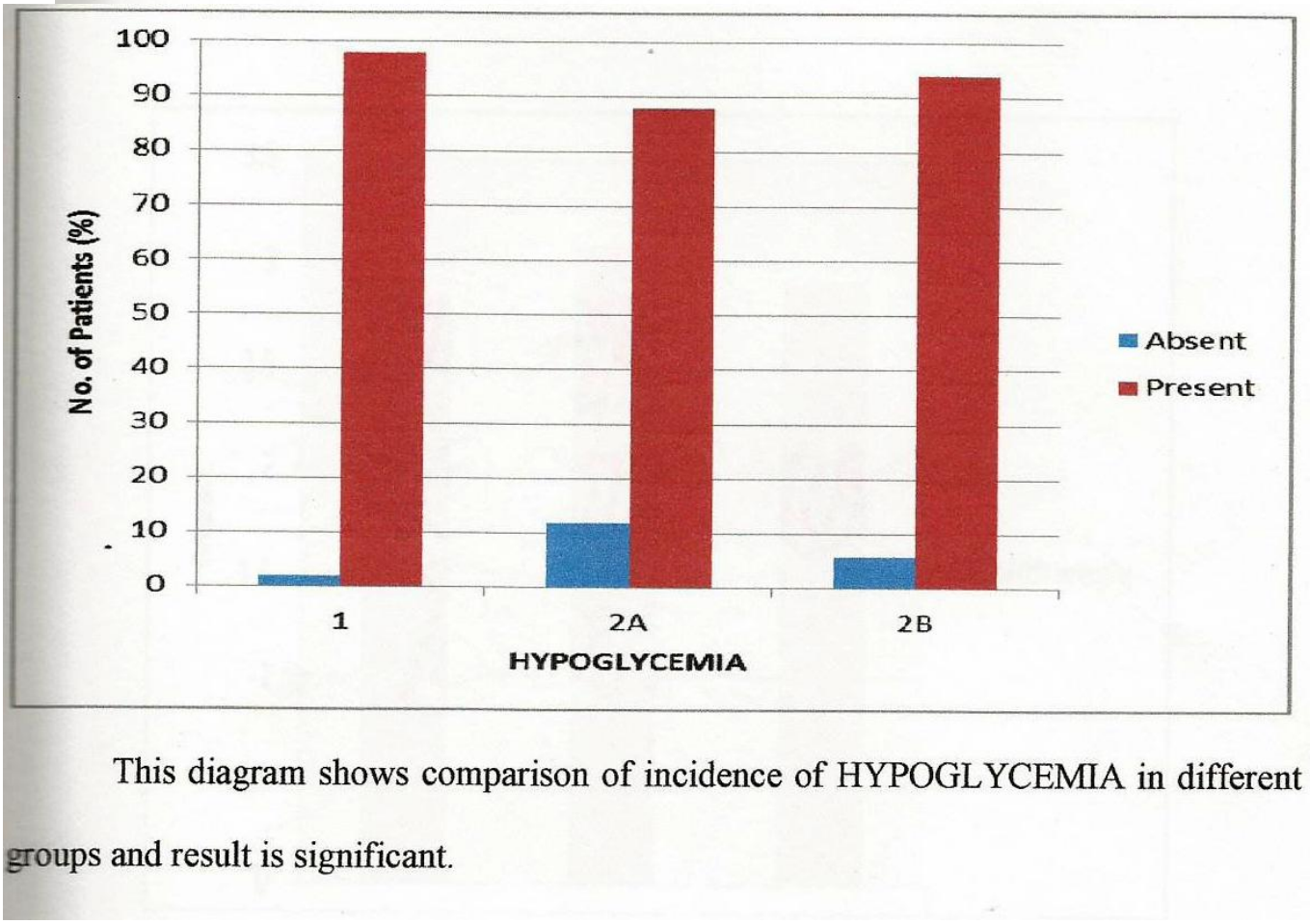


This diagram shows comparison of incidence of HYPERBILIRUBENEMIA in different groups and result is significant.

Table 7 ,Diagram 7

Neonatal hypoglycemia	Group 1	Group 2a	Group 2b
Absent	228(98%)	29(88%)	122(94%)
Present	4(2%)	4(12%)	8(6%)

X2 =10.2, p=.006, SIG



This diagram shows comparison of incidence of HYPOGLYCEMIA in different groups and result is significant.

TABLE 8; Diagram 8

DISCUSSION

Patients with pre gestational and GDM are at increased risk for adverse neonatal outcome..In our present study age and parity are similar in normal and impaired GTT groups. This result is similar to that of Yang et al(2)and R Bhat et al.(6) The mean GCT of all three groups are same. This shows that the GTT values are not dependent on GCT values.

In neonates,

Small for gestational age (SGA) :The incidence of SGA is2.6%in normal GTT group as compared to 0.8%in impaired GTT group which is not statistically significant. This result is comparable to KIM et al 101 in which it is 1.4%in normal GTT group as compared to 3.8% in impaired GTT(2).

The incidence of large for gestational age (LGA): 2.2% in normal GTT group in compared to 10.8% in impaired GTT group which is statistically significant. It is comparable to the study done by YANG et al ,in 199 cases in which it is 22%in normal GTT as compared to 40% in impaired GTT group.(2)

It is also comparable to the study done by Langer et al(7)in 126 woman the incidence of large infants (large for gestational age) was found to be significantly higher in the one abnormal oral glucose tolerance test group when compared with the normal (34% versus 9%; p <0.01)

APGAR score :The incidence of low APGAR score is 2.6% in normal GTT where as it is 6.4% in impaired GTT which is statistically significant.

Respiratory insufficiency: The incidence of respiratory insufficiency is 3.4% in normal GTT as compared to 2.7% in impaired GTT which is not significant. The results are also comparable to the study done by A. Bhat of 100 cases in which it is 0% in normal GTT group and 2.3% in impaired GTT group.(6)

Congenital anomaly: The incidence is 3.4% in normal GTT group as compared with 2.6%in impaired GTT group which is not statistically significant.

Hyperbilirubinemia is 4% in normal GTT as compared to27% in impaired GTT group which is statistically significant.

Neonatal hypoglycemia : is 2% in normal GTT group compared to 18% in impaired GTT group which very significant, This report is contrast to the study by YANG et al,of the 99 cases only 0.3% in normal GTT group as compared to 1% in impaired GTT group which is not significant.(2)

SUMMARY

This study was done to identify the importance of impaired GTT and raised GCT with normal sugar values.The results of our cohort study suggests that having a positive GCT is an independent risk factor for neonatal outcome. The women with impaired GTT should be considered as high risk and they should be closely monitored for their glycemic control to reduce the neonatal complications like large for gestational age, hypoglycemia, hyperbilirubinemia etc

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