DATA ANALYSIS & DISCUSSION

Table 1: PREVALENCE OF GDM AND MILD GESTATIONAL HYPERGLYCEMIA

	Normal No.%	*MGH No.%*	*GDM No.%*
Total enrolled	135	9 (6%)	6 (4%)

In this study, 150 antenatal mothers were subjected to glucose challenge test (GCT). Out of these 150 women, total 15 mothers had positive screening test (>140 mg/dl) and they were then subjected to glucose tolerance test. Weigers et al have classified women with positive GCT but negative OGTT as Mild Gestational Hyperglycemia (MGH) in accordance with the study.

The prevalence of MGH in this study was 6% and the prevalence of GDM was 4%.

Koukkou et al in a study of multiethnic population in London, found an overall prevalence of GDM of 3% with Asians being four times more likely to have GDM than Caucasians.

Samanta et al in a similar study using the 75 gm OGTT, found a prevalence of 1.38% amongst Asians in U.K.

Table: 2 AGE DISTRIBUTIONS

Age in years	*Normal n=135*	*MGH n=9*	*GDM n=6*
<25	88 (65.19)	3 (33.33)	1 (16.67)
≥25	47 (34.81)	6 (66.67)	5 (83.33)

=> χ^2=10.62

=> At degree of freedom=2 and p=0.05,

χ^2=5.99

So, difference is significant at 5% level.

Table 2 shows the age distribution of the subjects, 88 (65.19%) women were in the age group of <25 years in the normal group, 5 women in the GDM group were ≥25 years in age.

For the purpose of statistical analysis, the MGH and GDM groups have been combined in all tables. The association with the age is statistically significant in the ≥25 years age group.

Kjos et al also reported similar sort of results in patients with Gestational DM.

Another study in north India showed an advanced age is one of the high-risk factors for development of GDM.

Table: 3 GRAVIDA DISTRIBUTION

Gravida	*Normal n=135*	*MGH n=9*	*GDM n=6*
1	61 (45.19)	1 (11.11)	1 (16.67)
2	41 (30.37)	5 (55.55)	2 (33.33)
≥3	33 (24.44)	3 (33.33)	3 (50)

$\Rightarrow \chi^2 = 5.034$

=> At degree of freedom and p=0.05,

$\chi^2 = 9.49$

So, the difference is insignificant at 5% level.

Table 3 shows the Gravida distribution across the three groups. 33 (24.44%) women in the normal GCT group, 3 (33.33%) women in the MGH group, 3 (50%) women in the GDM group had gravida ≥3. This observation was found to be statistically significant.

Study of determination of risk factors of GDM done by Samanta in Netherlands showed high parity is the primary factor associated with the presence of Gestational Diabetes.

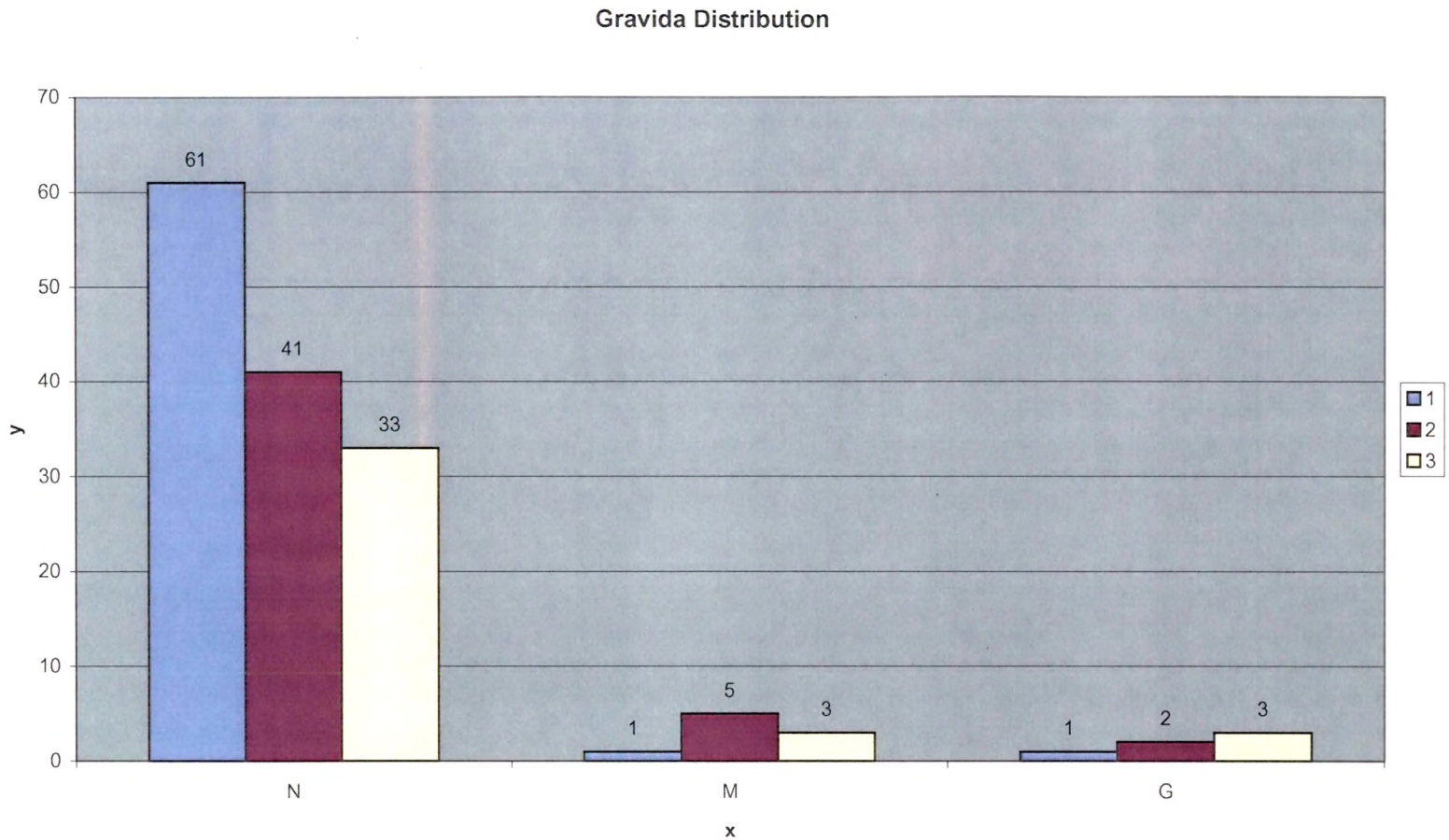
Gravida Distribution
70
60
50
40
30
20
10
0
y
61
41
33
1
5
3
1
2
3
N
M
G
x
1
2
3

Table: 4 GESTATIONAL AGE DISTRIBUTION

Gest. Age at screening	*Normal n=135*	*MGH n=9*	*GDM n=6*
19-23	11 (8.15)	3 (33.33)	1 (16.67)
24-28	114 (84.44)	4 (44.45)	2 (33.33)
29-33	8 (5.93)	1 (11.11)	1 (16.67)
≥34	2 (1.48)	1 (11.11)	2 (33.33)

$\Rightarrow \chi^2=29.52$

$\Rightarrow$ At degree of freedom= 6 and p=0.05

$\chi^2=12.59$

So, the difference is highly significant at 5% level.

Table 4 shows Gestational age distribution at screening. One hundred fourteen (84.44%) women were screened in the recommended gestational age period of 24-28 weeks. 15 (10%) women across all three groups were screened at the gestational age of 19-23 weeks. 15 (10%) women were screened beyond 29 weeks of gestation. Of these, 5 (3.33%) women were screened at ≥34 weeks of gestation. These 30 (20%) women who were screened outside the 24-28 week period had either high / average risk factors according to the Metzger classification or had booked late in pregnancy. 9 (30%) out of 30 (20%) women screened had either MGH or GDM.

One can infer from this table that women with high or average risk factors should be screened outside the recommended period of 24-28 weeks; perhaps at the first antenatal visit.

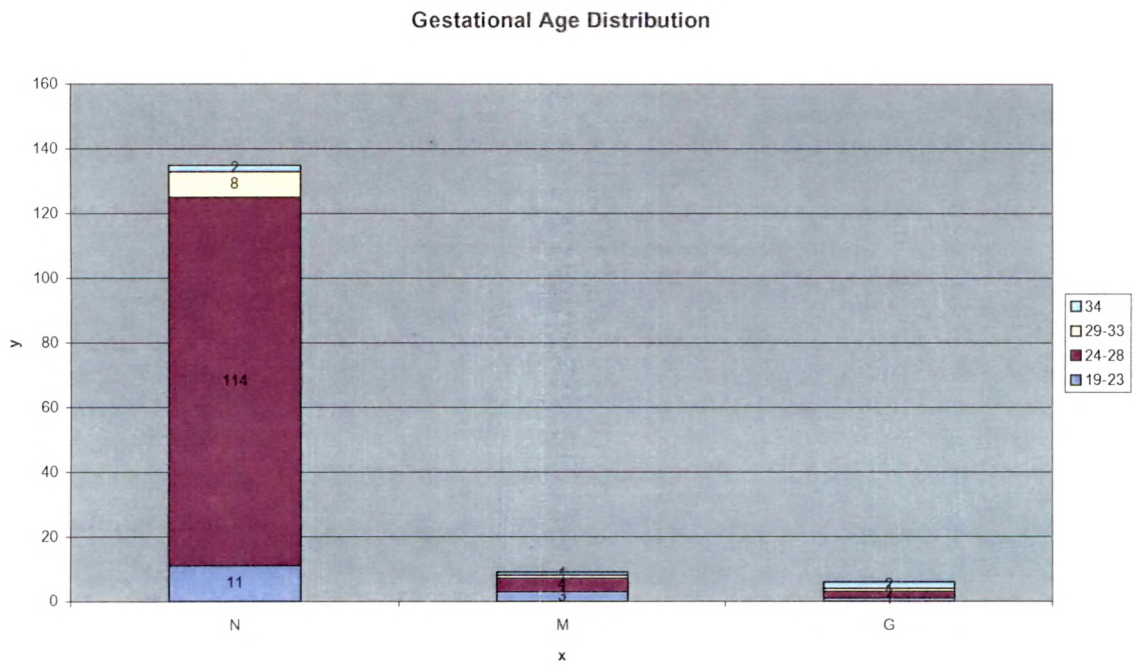

Table: 5 BODY MASS INDEX DISTRIBUTION

BMI KG/Sq.M	*Normal n=135*	*MGH n=9*	*GDM n=6*
≥25	23 (17.04)	5 (55.56)	5 (83.33)
<25	112 (82.96)	4 (44.44)	1 (16.67)

=> χ^2=27.08

=> At degree of freedom=2 and p=0.05

χ^2=5.99

So, the difference is highly significant at 5% level.

Table 5 shows the distribution of BMI. In the normal GCT group, 23 (17.04%) women had a BMI ≥25; in the MGH group 5 women (55.56%) had a BMI≥25 and in the GDM group 5 out of 6 (83.33%) women had a BMI≥25. These observations are all statistically significant.

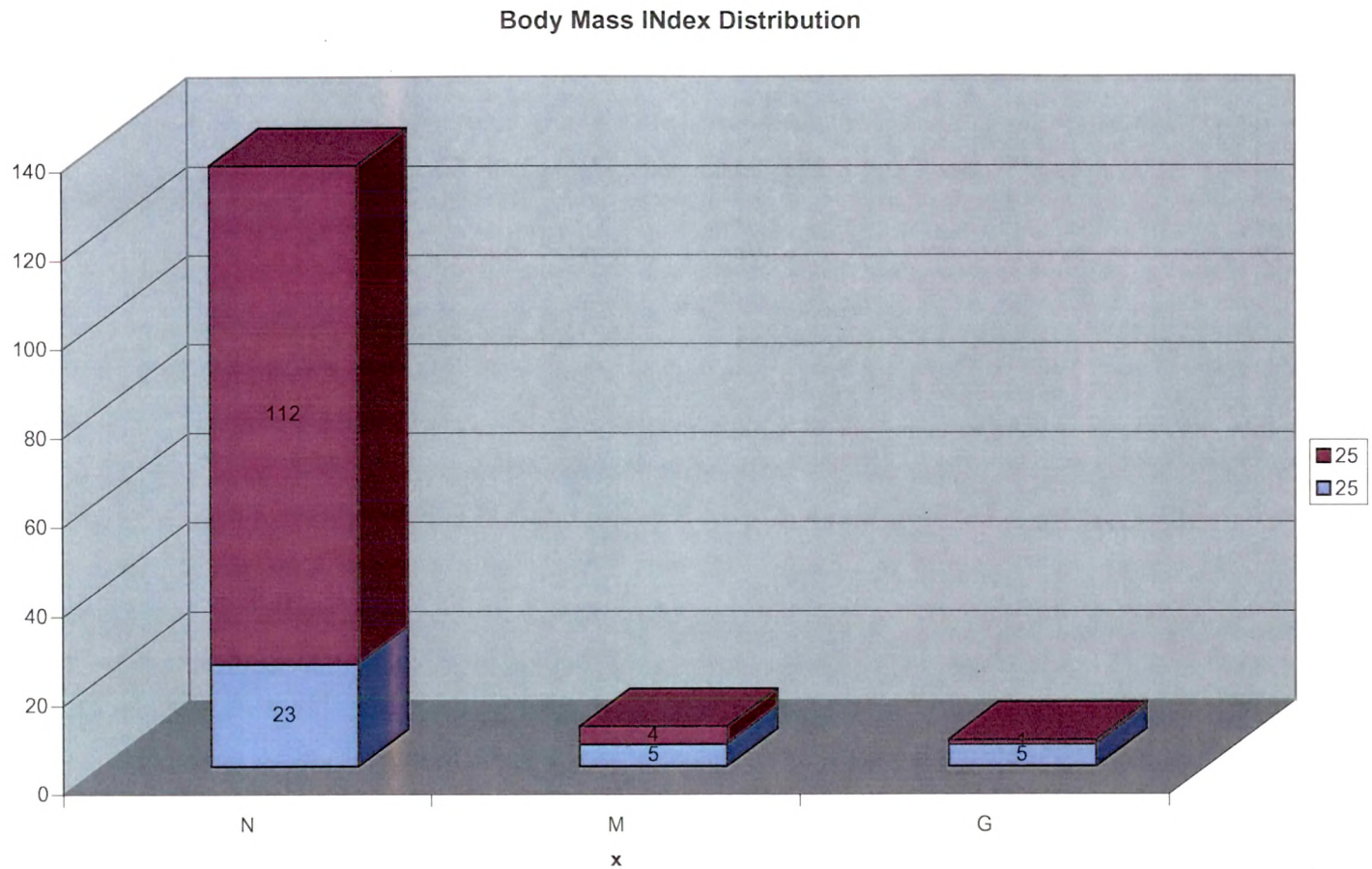
Body Mass INdex Distribution
140
120
100
80
60
40
20
0
112
23
4
5
1
5
N
M
G
x
25
25

Table: 6 WAIST-HIP RATIO DISTRIBUTION

Waist-Hip Ratio	*Normal n=135*	*MGH n=9*	*GDM n=6*
≥0.85	20 (14.81)	7 (77.78)	4 (66.67)
<0.85	115 (85.19)	2 (22.22)	2 (33.33)

=>χ^2=20.17

=>At degree of freedom=2 and p=0.05,

χ^2=5.99

So, the difference is highly significant at 5% level.

Table 6 shows the distribution of the Waist-Hip ratio. 11 (73.33%) out of 15 women having MGH or GDM had a Waist-Hip ratio of ≥0.85 compare to 20 (14.81%) women in the normal GCT group. These observations were also statistically significant.

In our study we found that BMI more than equal to 25 and waist-hip ratio more than equal to 0.85 are 8 times more likely to develop MGH or GDM.

Metzger et al has also reported similar results inpatients with MGH or GDM.

Similar study also was done by Frienkal N. which showed same results.

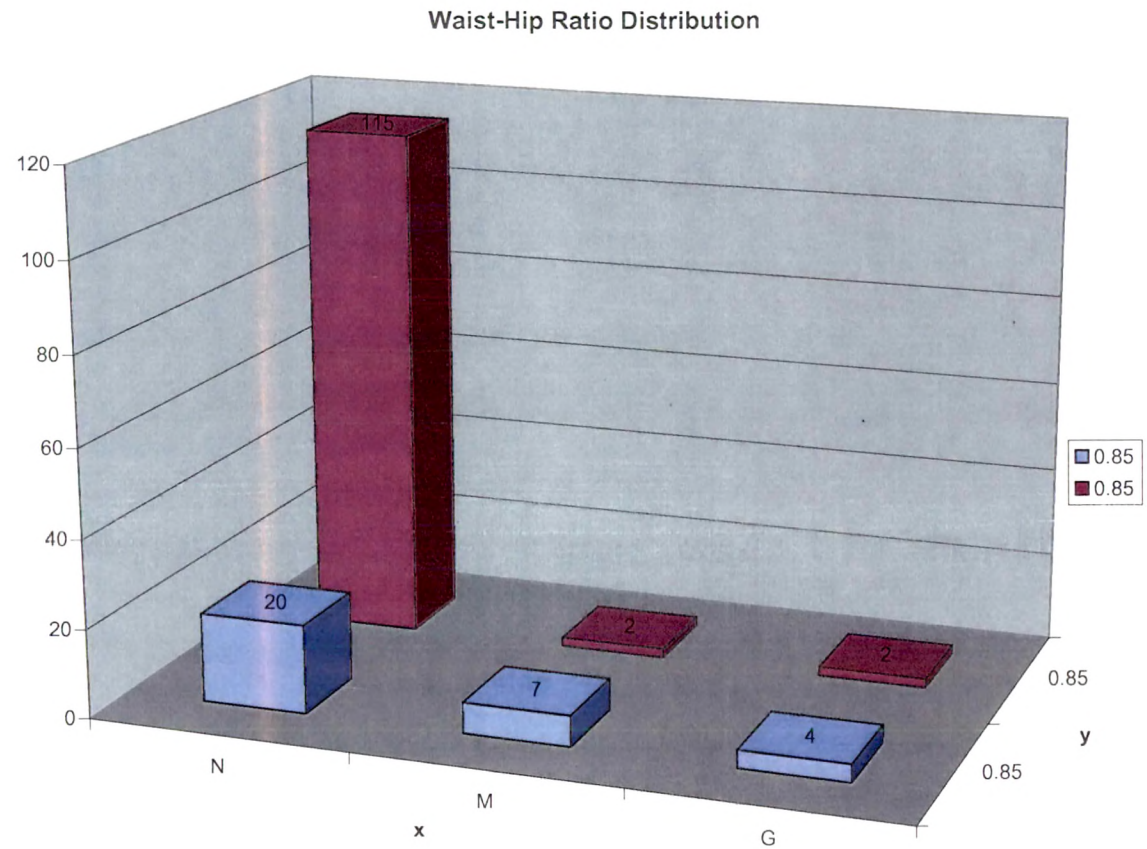
Waist-Hip Ratio Distribution
120
100
80
60
40
20
0
115
20
2
7
2
4
N
M
G
x
0.85
0.85
y
0.85
0.85

Table: 7 ASSOCIATED COMPLICATION

Associated Compli.	*Normal n=135*	*MGH n=9*	*GDM n=6*
PIH	5 (3.70)	2 (22.22)	2 (33.33)
APH	4 (2.98)	3 (33.33)	1 (16.67)
Pre Term	6 (4.44)	1 (11.11)	0
IUGR	5 (3.70)	0	0
Chronic HT	3 (2.22)	0	3 (50)
No Compli.	112 (82.96)	3 (33.34)	0

$\Rightarrow \chi^2=39.11$

$\Rightarrow$ At degree of freedom=10 and p=0.05

$\chi^2=18.31$

So, the difference is significant at 5% level.

Table 7 shows the distribution of associated complications; such as pregnancy induced hypertension (PIH), abruptio placentae, placenta previa, pre-term birth, intrauterine growth retardation and chronic hypertension. In the normal GCT group 23 (17.04%) subjects had an associated complication, whereas 112 (82.96%) women had no associated complication 6 (66.67%) women in MGH group had an associated complication and in the GDM group all 6 subjects had the same. These observations were statistically significant.

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Careful monitoring of blood pressure, weight gain and urinary protein excretion is recommended, particularly during the second half of gestation.

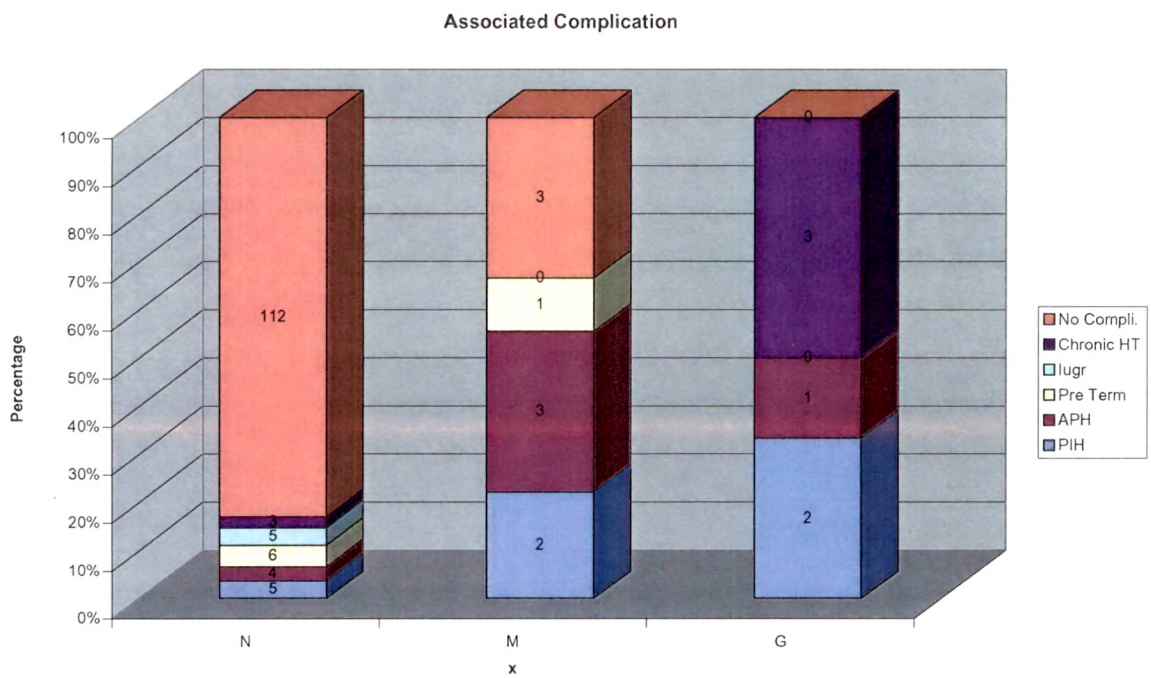

Table: 8 DISTRIBUTION OF BLOOD GLUCOSE LEVEL FOLLOWING GCT

Blood Glucose	*n=150 No.(%)*
<100 mg%	33 (22)
101-120 mg%	55 (36.67)
121-140 mg%	47 (31.33)
>140 mg%	15 (10)

Table 8 shows the distribution of blood glucose level following GCT. 47 (31.33%) women had a blood glucose level between 121-140 mg%.

In this study, we have been unable to document the time interval between screening and previous meal or snack. Although current guidelines state that fasting is unnecessary before the GCT, results do vary with the length of time since the last meal or snack.

Naylor et al had found that the specificity of the test had improved, with minimal loss of sensitivity by changing the single threshold of 140 mg% to threshold of 148, 142 and 150 mg% for post-prandial times of less than 2 hours, 2-3 hours and more than 3 hours respectively.

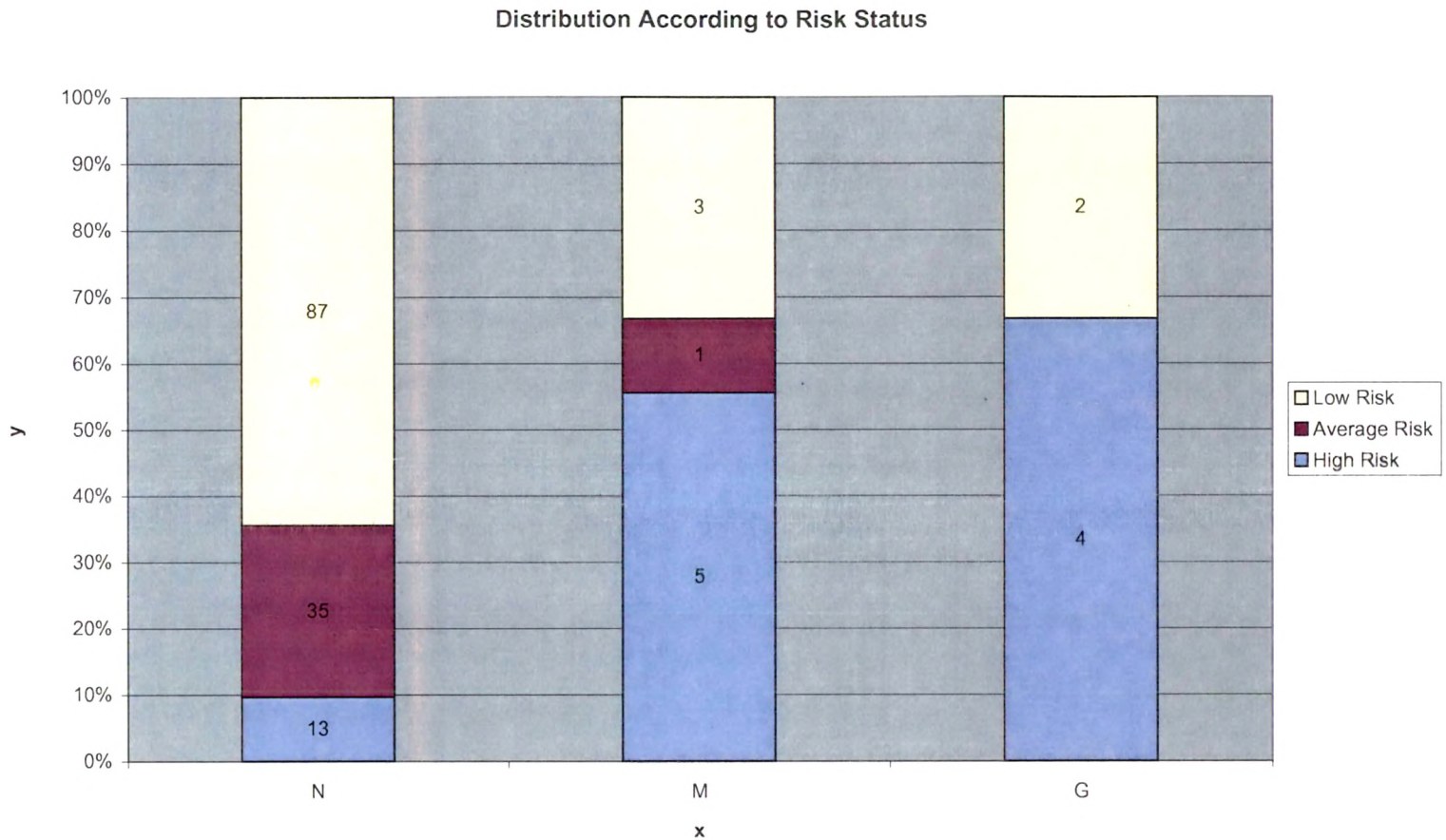
Distribution According to Risk Status
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
y
87
35
13
3
1
5
2
4
N
M
G
x
Low Risk
Average Risk
High Risk

Table: 9 DISTRIBUTION ACCORDING TO RISK STATUS

Risk Status	*Normal n=135*	*MGH n=9*	*GDM n=6*
High Risk	13 (9.63)	5 (55.55)	4 (66.67)
Average Risk	35 (25.93)	1 (11.11)	\
Low Risk	87 (64.44)	3 (33.33)	2 (33.33)

=> χ^2= 30.42

=> At degree of freedom=4 and p=0.05

χ^2=9.49

So, the difference is highly significant at 5% level.

Table 9 shows the distribution of subjects according to risk status as defined by Metzger et al.

In the normal GCT group, 13 (9.63%) subjects were in the high-risk category and 35 (25.93%) were in the average risk category. In the MGH group, 6 (66.67%) women were in high/average risk category and in the GDM group 4 (66.67%) were in the high-risk category. These observations are statistically significant for all three groups.

The Fourth International Workshop Conference on GDM has suggested an approach of screening for GDM, which should include an assessment of the clinical characteristics of all women. Pregnant women with high-risk clinical characteristics should then be given the 50 gm

assessment of the clinical characteristics of all women. Pregnant women with high-risk clinical characteristics should then be given the 50 gm OGTT. Women who are found to be average / low clinical risk should be reassessed at 24-28 weeks visit. At this time women with low risk clinical characteristics do not need further testing, since the risk in these women is low, whereas women with characteristics placing them at average or high risk should undergo glucose testing.

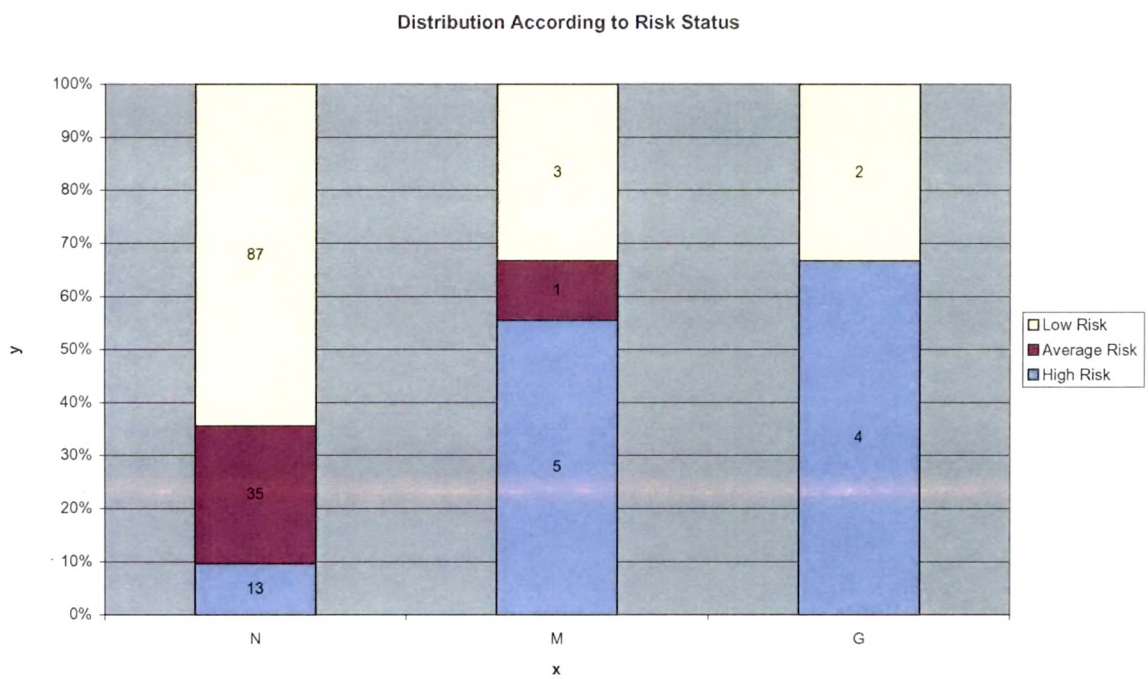

Table: 10 MODE OF DELIVERY

MOD	*Normal n=135*	*MGH n=9*	*GDM n=6*
LSCS	20 (14.81)	1 (11.11)	3 (50)
SVD	94 (69.63)	6 (66.67)	2 (33.33)
IVD	21 (15.56)	2 (22.22)	1 (16.67)

=> χ^2=23.32

=> At degree of freedom=4 and p=0.05

χ^2=9.49

So, the difference is significant at 5% level.

Table shows the distribution of mode of delivery. In the normal GCT group 20 (14.81%) women; in the MGH group 1 (11.11%) and in the GDM group 3 (50%) women were delivered by LSCS. Spontaneous vaginal deliveries were 94 (69.63%) in normal GCT group, 6 (66.67%) in MGH group and 2 (33.33%) in GDM group. In the normal group, 21 (15.56%) women, in MGH group 2 (22.22%) women and in GDM group 1 (16.67%) women were delivered by instrumental vaginal delivery. To minimise iatrogenic morbidity, it has been suggested that the route of delivery in well-controlled women should be based on the same maternal and fetal consideration that apply to non-diabetic women.

Gestational diabetes is not in itself an indication for LSCS. Nevertheless, the rates of caesarean delivery among the women in GDM are more than those for non-diabetic women.

Table: 11 BIRTH WEIGHT DISTRIBUTION

Birth weight (kg)	*Normal n=135*	*MGH n=9*	*GDM n=6*
≤2	24 (17.78)	2 (22.22)	\
2.1-2.5	42 (31.11)	3 (33.33)	\
2.6-3.0	47 (34.81)	1 (11.11)	1 (16.67)
3.1-3.5	17 (12.60)	2 (22.22)	3 (50)
>3.5	2 (1.50)	1 (11.11)	2 (33.33)

=> χ^2=28.41

=> At degree of freedom=8 and p=0.05

χ^2=15.51

So, the difference is significant at 5% level.

Table 11 shows the distribution of birth weight 147 neonates born in all three groups. In normal GCT group, 66 (48.89%) babies had a birth-weight <2.5 kg; in the MGH group/ GDM group 5 (33.33%) babies had a birth-weight <2.5 kg. In the normal GCT group, 2 (1.50%) babies had a birth-weight >3.5 kg, and in the MGH/GDM group 3 (20%) had the same. These observations were statistically significant for babies weighing >3 kg.

Macrosomia has been reported with varying frequency in infants of women with GDM. A simplistic view of macrosomia is that it results from the delivery of the excess glucose to the fetus as a consequence of maternal hyperglycemia. Maternal hyperglycemia accounts for only a

Macrosomia has been reported with varying frequency in infants of women with GDM. A simplistic view of macrosomia is that it results from the delivery of the excess glucose to the fetus as a consequence of maternal hyperglycemia. Maternal hyperglycemia accounts for only a small fraction of variants with a birth-weight of the infants of mothers with GDM, with factors such as obesity, high serum concentration of amino acids and lipids being other contributing factors.

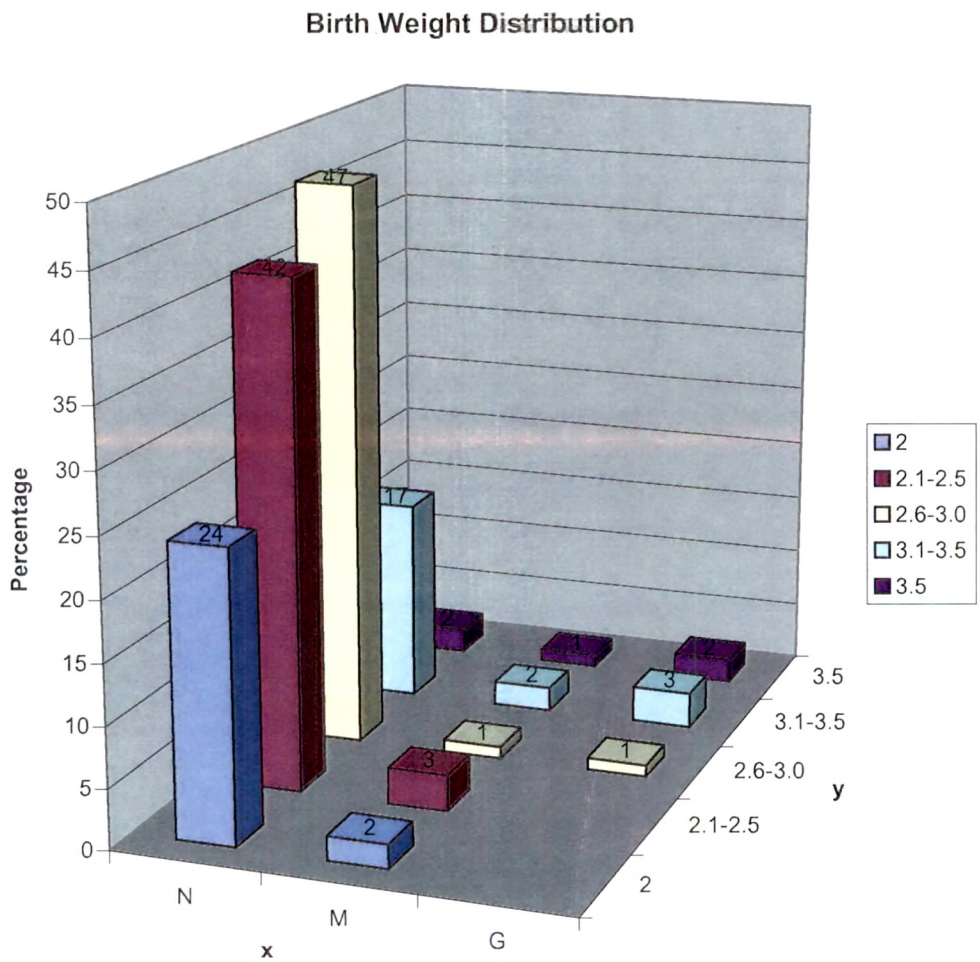

Table: 12 NEONATAL COMPLICATIONS

Neonatal complications	*Normal n=135*	*MGH n=9*	*GDM n=6*
Birth Asphyxia	13 (9.64)	1 (11.11)	1 (16.67)
Hypoglycemia	1 (0.74)	1 (11.11)	1 (16.67)
Hyperbilirubinemia requiring phototherapy	2 (1.48)	2 (22.22)	\
Congenital Anomalies	1 (0.74)	\	\
IUGR	2 (1.48)	\	\
Stillbirth	3 (2.22)	\	\
No complication	113 (83.70)	5 (55.56)	4 (66.66)

Table 12 shows distribution of neonatal morbidity. In the normal GCT group 22 (16.30%) babies had various neonatal complications such as birth asphyxia, hypoglycemia, hyperbilirubinemia requiring phototherapy, congenital malformations, IUGR and stillbirth. The corresponding figures in MGH/GDM group were 6 (40%). Hypoglycemia, jaundice, respiratory distress syndrome (RDS), polycythemia have been reported with varying frequency in infants of women with GDM.

Insulin therapy decreases the frequency of fetal macrosomia and perinatal morbidity. Optimal insulin regimens have not been determined and tailoring of regimens to achieve blood glucose targets in individual patients is recommended.

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