MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2024.9.225.227

OPEN ACCESS

Key Words
Macrosomia, birth weight, complications

Corresponding Author
Koppala Bhavani,
Department of Obstetrics and Gynecology, ACSR Government Medical College, Nellore, Andhra Pradesh, India

Author Designation
[1]Assistant Professor
[2-4]Associate Professor

Received: 15 July 2024
Accepted: 13 August 2024
Published: 15 August 2024

Citation: Nayanamgari Mounika, Kavitha Mettu, Uriti Sujatha Patnaik and Koppala Bhavani, 2024. A Study on Prevalence and Risk Factors of Macrosomia in A Tertiary Care Centre. Res. J. Med. Sci., 18: 225-227, doi: 10.36478/makrjms. 2024.9.225.227

A Study on Prevalence and Risk Factors of Macrosomia in A Tertiary Care Centre

[1]Nayanamgari Mounika, [2]Kavitha Mettu, [3]Uriti Sujatha Patnaik and [4]Koppala Bhavani

[1-4]Department of Obstetrics and Gynecology, ACSR Government Medical College, Nellore, Andhra Pradesh, India

ABSTRACT

Macrosomia is defined as birth weight of >4000g irrespective of gestational age. It is associated with maternal and foetal complications like Cephalo Pelvic Disproportion, PROM, Prolonged Labour, Shoulder Dystocia, Operative Delivery, Perineal Trauma, Post Partum Hemorrhage, and Birth Trauma like Obstetric Brachial Plexus Injury, Birth Fracture of Humerus or Clavicle and Birth Asphyxia. To study the Prevalence and Risk Factors of Macrosomia. This was a retrospective study of the mothers with neonates (birth weight of >4000 g) in Government General Hospital, Nellore for a period of one year. 35 babies were found to be macrosomic per 2500 deliveries. Prevalence was 1.4%. Younger age group were associated with Macrosomia (17-25 yrs) in this study. The gestational age >40 weeks were associated with Macrosomia. BMI $\geq$30 Kg/m^2 was associated with Macrosomia in 5.71% of cases. Previous history of Macrosomia was seen in 11.42% of cases. Males were being macrosomic by more than 2 times than female sex. Gestational diabetes was a risk factor seen in 14.28% of cases. Preeclampsia was a risk factor seen in 14.28% of cases. Rh negative pregnancy was a risk factor in 8.57% of cases. Polyhydramnios was associated with 11.42% of cases. The prevalence of Macrosomia was 1.4% and the risk factors associated with Macrosomia were age (17-25 yr), Maternal Obesity, >40 weeks GA, Multiparity, history of Macrosomia, Gestational Diabetes, Rh negative pregnancy, Polyhydramnios, Hypothyroidism and Male sex. Early detection and management of these mothers prevents the maternal and neonatal complications of Macrosomia.

INTRODUCTION

Macrosomia is defined as the birth-weight of >90th percentile for a given gestational age or a birth weight of >4000g irrespective of gestational age. Macrosomia is a common problem due to its increasing prevalence. It is associated with maternal and foetal complications like Cephalo Pelvic Disproportion, PROM, Prolonged Labour, Shoulder Dystocia, Operative Delivery, Perineal Trauma, Post Partum Hemorrhage and Birth Trauma like Obstetric Brachial Plexus Injury, Birth Fracture of Humerus or Clavicle and Birth Asphyxia.

Aim of the Study: To study the prevalence and risk factors of Macrosomia

MATERIALS AND METHODS

A retrospective study of the mothers with neonates (birth weight of >4000 g) in Government General Hospital, Nellore for a period of one year. The parameters studied were Macrosomia, Maternal age, Parity, Gestational age, BMI, Foetal biometry, Previous history of Macrosomia, Associated factors like GDM, Preeclampsia, Polyhydramnios, Hypothyroidism, Rh negative pregnancy, Sex of the neonate.

RESULTS AND DISCUSSIONS

35 babies were found to be Macrosomic per 2500 deliveries. Prevalence was 1.4%

This study was aimed to assess the prevalence and associated factors of Macrosomia among neonates delivered in the ACSR Government General Hospital, Nellore.

The Prevalence in this study was 1.4%. In a study by Koyanagi *et al,* the 90th percentile of birth weight was 3250g in India and the prevalence of a birth weight of 4kg or greater was 0.5%[1]. Younger age group were associated with Macrosomia (17-25 yrs) in this study, but Rajaee[2] in their study reported that mothers aged >35 years had higher chances of delivering a macrosomic baby (35-39 years: 1.8% and >40 years: 1.2%) when compared to those aged <35 years (1.1%). Kenny[3] also observed that the risk of Macrosomia increased significantly with advancing maternal age. The gestational age >40 weeks were associated with Macrosomia (due to continued growth process in utero). In a study conducted by Chervenak *et al* the incidence of Macrosomia at 41 weeks gestation was 25.5%[4].

BMI ≥30 Kg/m2 was associated with Macrosomia in 5.71% of cases. In a study conducted by Gaudet *et al* on Maternal obesity and occurrence of fetal Macrosomia in their systematic review and meta-analysis confirms that maternal obesity is associated with fetal overgrowth[5].

Among the Primigravida 31.42% cases-previous history of Macrosomia was seen in 11.42 % of cases. In a study conducted by Mahin Najafian and Maria Cheraghi, multiparity was significantly associated with Macrosomia group compared to control group (81% versus 34%, P<0.05) which was comparable with (13.2% versus 9.5%, P<0.0001)[6]. There was significant positive association with male sex. Males were being macrosomic by more than 2 times than female sex[7].

Gestational diabetes was a risk factor seen in 14.28% of cases explained by the pederson's hypothesis. Xiong et al revealed that infants born to mothers with GDM had 1.12 higher odds [aOR: 1.12 (1.07-1.17)] of delivering a macrosomic baby[8]. A study conducted by Lawlor *et al* revealed an adjusted odds ratio for Macrosomia of 5.50 (95% CI, 1.18-10.30) in mothers with GDM.

Preeclampsia was a risk factor seen in 14.28% of cases. Gestational diabetes with preeclampsia was seen in 3% cases and gestational diabetes and obesity was seen is 4% of cases. Sachdeva[9] and Zareen[10] had reported it as 15% and 14.8% respectively among rural women in hospital based studies.

Rh negative pregnancy was a risk factor in 8.57% of cases. In a study conducted by Gloria Bottini *et al* foetal Macrosomia was associated with two specific genomic sites: phosphoglucomutase locus 1 (PGM1)-Rhesus blood group (Rh) linkage group (chromosome 1) and Hind III restriction fragment length polymorphism (RFLP) linked to insulin-like growth factor 1 (IGF1) (chromosome 12). In PGM (1)2-1 mothers carrying the E allele, there is a proportion of 8.7% of macrosomic newborns as compared with 39.6% in mothers with other genotypes[11].

Polyhydramnios was associated with 11.42% of cases. Polyhydramnios with GDM was seen in 5% of cases. In a study conducted by R Sohaey *et al* Idiopathic polyhydramnios was associated with large for

Table 1: Variables that were assessed during study

Variable	Category	Frequency(n)	Percentage %
35 neonates with	4-4.5	34	97.14
>4000 g B.wt	4.5 -5	1	2.85
Mode of delivery	Normal vaginal delivery	11 Primi-5 Para 1 - 6	31.42
	Caesarean section	24	68.57
Age	17 -25 Yrs	32	91.42
	25-35 Yrs	3	8.57
Parity	Primi	11	31.42
	Para-1	15	42.85
	Para-2	8	22.85
	Para - 3	1	2.85
Gestational age	> 40 Weeks	10	28.57
BMI	≥30 Kg/m^2	2	5.71
Foetal Biometry	AC > 90th percentile	21	60
Previous history of macrosomia	-	4	11.42
Sex of neonate	Male	23	65.71
	Female	12	34.28
Gestational Diabetes Mellitus		5	14.28
Preeclampsia		5	14.28
Polyhydramnios		4	11.42
Rh negative mother		3	8.57
Hypothyroidism		2	5.71
PROM		3	8.57
Anaemia		1	2.85

gestational age foetuses and Macrosomia independent of maternal diabetes. The addition of polyhydramnios to accelerated foetal growth significantly enhances the risk of Macrosomia.

Hypothyroidism was a risk factor in 5.71% of cases in a study conducted by Vrijkotte *et al* Maternal subclinical hypothyroidism in early pregnancy (TSH >2.5 mU/L, 7.3%) was associated with increased odds for LGA in male sex[12].

8.57% of cases presented to OP day with premature rupture of membranes. In a study conducted by Bhat *et al* on outcome of gestational diabetes, 15.6 % had PROM[13].

In this study, caesarean sections were more due to Macrosomia. The department fairly strictly adheres to the Cochrane recommendation of not inducing early for macrosomia[14]

CONCLUSION

The prevalence of Macrosomia was 1.4% and the risk factors associated with Macrosomia were age (17 -25yr), maternal obesity, >40 weeks GA, multiparity, history of Macrosomia, gestational diabetes, Rh negative pregnancy, polyhydramnios, hypothyroidism and male sex. Early detection and management of these mothers prevents the maternal and neonatal complications of Macrosomia.

REFERENCES

1. Koyanagi, A., J. Zhang, A. Dagvadorj, F. Hirayama and K. Shibuya, *et al*., 2013. Macrosomia in 23 developing countries: An analysis of a multicountry, facility-based, cross-sectional survey. Lancet, 381: 476-483.
2. Rajaee, M., S. Amirzadeh, F. Mirblook and M.A. Soltani, 2010. 1. The Effect of Maternal Age on Pregnancy Outcome. Asian J Medi Scie., 2: 159-162.
3. Kenny, L.C., T. Lavender, R. McNamee, S.M. O'Neill, T. Mills and A.S. Khashan, 2013. Advanced maternal age and adverse pregnancy outcome: Evidence from a large contemporary cohort. PLoS ONE, 8: 1-9.
4. Chervenak, J.L., M.Y. Divon, J. Hirsch, B.A. Girz and O. Langer, 1989. Macrosomia in the postdate pregnancy: Is routine ultrasonographic screening indicated? Am. J. Obstet. Gynecol., 161: 753-756.
5. Gaudet, L., Z.M. Ferraro, S.W. Wen and M. Walker, 2014. Maternal obesity and occurrence of fetal macrosomia: A systematic review and meta-analysis. BioMed Res. Int., Vol. 2014 .10.1155/2014/640291.
6. Najafian, M. and M. Cheraghi, 2012. Occurrence of fetal macrosomia rate and its maternal and neonatal complications: A 5-year cohort study. ISRN Obstet. Gynecol., Vol. 2012 .10.5402/ 2012/353791.
7. Acharya, P. and S. Singh, 2019. A case of foetal macrosomia. Int. J. Rep., Contr, Obs. Gyn., 8: 3801-3804.
8. Xiong, X., L.D. Saunders, F.L. Wang and N.N. Demianczuk, 2001. Gestational diabetes mellitus: Prevalence, risk factors, maternal and infant outcomes. Int. J. Gyne. amp Obstet., 75: 221-228.
9. Mehta, B., V. Kumar, S. Chawla, S. Sachdeva and D. Mahopatra, 2015. Hypertension in pregnancy: A community-based study. Indian J. Comm Med., 40: 273-278.
10. Zareen, N., S. Naqvi, N. Majid and H. Fatima, 2009. 1. Perinatal outcome in high risk pregnancies. J Coll Phys Surg Pak., 19: 432-435.
11. Gloria, B.F., G. Gerlini, N. Lucarini, A. Amante, P. Lucarelli,et al., 1994. Both maternal and foetal genetic factors contribute to macrosomia of diabetic pregnancy. Hum. Heredity, 44: 24-30.
12. Vrijkotte, T.G.M., E.J. Hrudey and M.B. Twickler, 2017. Early maternal thyroid function during gestation is associated with fetal growth, particularly in male newborns. J. Clin. Endo. amp Metab., 102: 1059-1066.
13. Bhat, M., K.N. Ramesha, S.P. Sarma, S. Menon and S.G. Kumar, 2012. Outcome of gestational diabetes mellitus from a tertiary referral center in south India: A case–control study. J. Obstet. Gyne. India, 62: 644-649.
14. Irion, O. and M. Boulvain, 2000. Induction of labour for suspected fetal macrosomia. Coch Data Syst Rev., Vol. 2.