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Original Research Article

Maternal factors associated with large for gestational age babies and its outcome when compared with those of appropriate for gestational age

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ABSTRACT

Background: Large for gestational age (LGA) babies are known to have a higher incidence of birth trauma, difficult delivery and Caesarean sections. Knowledge about maternal factors associated with this can help in prediction and prevention of complications.

Methods: Maternal factors in 112 cases of LGA babies was studied along with its outcome and compared with an equal number of controls.

Results: 0.05% deliveries resulted in LGA babies. Age and parity were not significantly different in the two groups and so were the associated medical disorders of hypothyroidism and gestational hypertension. Significant association was found with post-dated pregnancies ($p=0.04$) and gestational diabetes mellitus ($p=0.05$). Also, higher number of primary Caesarean sections resulted in the case group.

Conclusions: Post dated pregnancies and gestational diabetes were maternal factors associated with LGA babies and higher number of primary Caesarean sections resulted in these cases.

Keywords: Large for gestational age, Maternal factors, Outcome

INTRODUCTION

Foetal macrosomia is a common obstetrical problem affecting 20% babies born at term.¹ Conventionally babies with birth weight more than 90th percentile is considered to be large for gestational age and those between 5th and 90th percentile as appropriate for gestational age. The birth weight cut-off may be based on absolute birth weight or greater than a particular percentile for the babies of that gestational age.² Large for gestational age babies can lead to complications during delivery like prolonged labour, shoulder dystocia, birth injuries, post-partum haemorrhage, increased need for caesarean sections for cephalopelvic disproportion, anaesthetic complications and thromboembolic events.³ Also neonatal adverse outcomes of hypoglycemia,

hypomagnesemia and hyperbilirubinemia are more common in these babies.⁴ Antenatal detection of large for gestational age foetus will be helpful in anticipating these complications. This study is undertaken to determine the maternal factors associated with this condition so that the complications can be anticipated and managed in a better manner if not prevented.

METHODS

This study was conducted in a tertiary care center based on collection of retrospective data about large for gestational age (LGA) babies born over a period of one year. The inclusion criteria were singleton pregnancies which resulted in LGA babies over this period of time. All the mothers who delivered babies who were large for

gestational age were categorized as the case group. The control group consisted of an equal number of women who delivered singleton babies over the same time period who were considered to be appropriate for gestational age. Large for gestational age was taken to be a birth weight cut-off of more than 90th percentile for the gestational age.

Appropriate for gestational age was considered to be birth weights between 5th and 90th percentile for the gestational age.

The maternal factors associated with these pregnancies were recorded which were age, parity, gestational age at

delivery, associated medical complications like gestational diabetes mellitus, gestational hypertension and hypothyroidism. Delivery outcomes studied were the mode of delivery, baby birth weight and need for neonatal intensive care. The above parameters in the case group were then compared with the control group and statistical analysis was done for the data.

RESULTS

A total number of 112 cases were recorded over a period of one year which constituted 0.05% of the deliveries and named as the case group. The control group consisted of equal number of patients who delivered AGA babies.

Table 1: Age distribution of mothers with LGA babies.

Obs.	Sum	Mean(years)	Variance	Std Dev	(95% CI mean)	Std Err
112	2973.00	26.54	13.28	3.64	25.86 - 27.23	0.34

Table 2: Order of pregnancy in the case group.

Gravida	n	%
1	40	35.7
2	46	41.1
3	19	17.0
4	04	3.6
5	02	1.8
6	01	0.9
Total	112	100

The mean age of the mothers in case group was 26.5 years (Table 1) and 41.1% were 2nd gravida (Table 2). 42% cases delivered between 39 to 40 completed weeks compared to 36.6% in control group (Table 3). The median weight of the LGA babies was 3.7 kgs (Table 4). There was a significantly higher number of post-dated pregnancies in the case group ($p=0.04$) (Table 5).

Table 3: Gestational age at delivery of case and control groups.

Gestational age(weeks)	LGA	%	AGA	%
37-38	7	6.3	25	22.3
38-39	31	27.7	31	27.7
39-40	47	42.0	41	36.6
40-41	27	24.1	15	13.4
Total	112	100	112	100

The existence of associated medical disorders like gestational diabetes mellitus, hypothyroidism and gestational hypertension in the case and control groups were 15.2%, 7.1%, 6.3% and 7.1%, 8.9% and 4.5% respectively. Significant statistical association was found with gestational diabetes mellitus ($p=0.05$) and LGA babies (Table 5).

Table 4: Birth weight of LGA babies.

Obs.	Sum	Mean (kgs)	Variance	Std Dev	(95% CI mean)	Std Err
112	425.90	3.80	0.0531	0.230	3.76- 3.85	0.02

Table 5: Comparison of maternal factors and outcome in LGA and AGA babies.

Parameter	LGA (n=112)	AGA (n=112)	Chi ²	P value
Multi gravida	72	62	1.85	0.17
Post-dated gestation	27	15	4.2	0.04
Gestational diabetes	17	08	3.65	0.05
Hypothyroidism	08	10	0.24	0.60
Gestational hypertension	07	05	0.35	0.50
Primary LSCS	41	26	4.8	0.02

Regarding delivery outcomes, 61.2% cases required emergency Caesarean section and 29.4% babies needed neonatal intensive care in the case group.

The need for emergency Caesarean sections were significantly more in the case group when compared with the control ($p=0.02$) (Table 5). 2 (1.8%) babies had shoulder dystocia in the study group.

DISCUSSION

Advanced maternal age was not found to be associated with LGA babies in a study by Khalil et al when the data was adjusted for potential confounding variables for pregnancy and maternal factors and similar results were obtained in the present study.⁵ In a Danish study by Lan-Pidhainy et al, multiparous women were found to be at an increased risk for delivering LGA babies whereas the present study does not show such an association.⁶ Post-dated pregnancies had an association with LGA babies in the present study ($p=0.04$).

Maternal overweight/obesity had a population attributing factor of 15.3% in case of LGA babies in a study in Amsterdam.⁷ Increasing gestational weight gain was shown to be associated with LGA babies and Caesarean section in the Danish study.⁶ Chung et al studied the adverse effects of increased gestational weight gain among 1950 pregnant women based on their pre-pregnancy body mass index and found that LGA infants and Caesarean deliveries were higher in that group.⁸ In their study by Mc Innis et al significant reduction of incidence of LGA babies were seen if the women achieved normal body weight pre pregnancy or lose 10 % of their body weight.⁹ On the contrary Averett et al found no association of maternal obesity and LGA babies.¹⁰ However, since the present study was a retrospective analysis of hospital data, information regarding pre pregnancy body mass index and gestational weight gain was not available.

Brankica et al in their study showed a significant association of LGA babies with mothers having gestational diabetes mellitus and commented that fasting and 1st hour plasma glucose levels from oral glucose tolerance test may predict LGA babies in pregnancies associated with this medical disorder.¹¹ Abdalrahman et al have concluded from their study that gestational diabetes mellitus, even when controlled also can lead to higher number of LGA babies.¹² In our current study also there was a significant association of LGA babies in pregnant women with gestational diabetes ($p=0.05$).

Clinical hypothyroidism was not found to be associated with LGA baby's in their studies by Kumru et al in Turkey and Nazarpour et al in Iran.^{13,14} Similar results were found in the present study also.

Regarding mode of delivery, both Lan-Pidhainy et al and Chung et al found an increased number of Caesarean

sections in LGA babies.^{6,8} Person et al also inferred from their study that disproportionate LGA babies had a higher incidence of Caesarean sections and composite neonatal morbidities like birth trauma, low Apgar score, hypoglycemia and respiratory disorders.¹⁵ In this present study also there was a significant association of primary Caesarean section with LGA babies ($p=0.02$).

CONCLUSION

Maternal factors associated with large for gestational age babies were post-dated pregnancies and gestational diabetes mellitus. LGA babies were associated with more number of primary Caesarean sections.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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