

## Abstract

This research aimed to investigate factors affecting macrosomia in mothers with Gestational Diabetes Mellitus at Maharaj Nakorn Chiang Mai Hospital. A retrospective study was conducted utilizing machine learning-based data to predict large-for-gestational-age fetuses. The study population comprised 981 cases, including 96 mothers who delivered macrosomic infants and 885 mothers who delivered normal-weight infants, spanning from January 2011 to December 2021. Multiple logistic regression analysis was employed for statistical evaluation.

## Introduction

Macrosomia is defined as a newborn with a birth weight greater than or equal to 4,000 grams or a weight greater than the 90th percentile for gestational age. It is categorized into 3 risk groups: infants weighing 4,000-4,499 grams, 4,500-4,999 grams, and more than 5,000 grams. Infants weighing more than 5,000 grams have a higher mortality rate that increases proportionally with weight.

Currently, the incidence of macrosomic infants is increasing. Global statistics show rates ranging from 3.0-15.0%. Across 23 countries, the average rate is between 4.0-5.0%, while in developed countries, the incidence has increased significantly to 15.0-25.0%.

The most common problem associated with macrosomic infants is shoulder dystocia. The incidence of shoulder dystocia has been trending upward globally since the mid-20th century. The normal incidence rate is 0.5%, but currently ranges between 0.2-3.0%.

Gestational diabetes mellitus is an obstetric complication with increasing prevalence. In the United States, it affects approximately 7% of pregnancies or about 200,000 cases per year. In 2016, Thailand reported an incidence of 16.2%. Women who have experienced gestational diabetes have a 35-80% chance of recurrence in subsequent pregnancies.

Gestational diabetes poses potential dangers to both mother and infant. If maternal blood glucose levels remain uncontrolled, elevated glucose passes to the fetus, resulting in the fetus receiving glucose concentrations equivalent to the mother's. Poor glucose control in early pregnancy may increase the risk of congenital malformations.

## Objectives

This research aimed to investigate factors affecting macrosomia in mothers with Gestational Diabetes Mellitus at Maharaj Nakorn Chiang Mai Hospital

## Methodology



## Tools

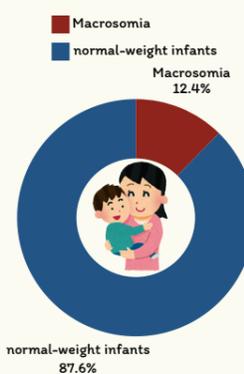
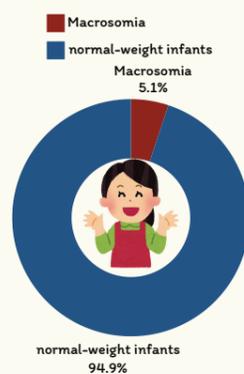
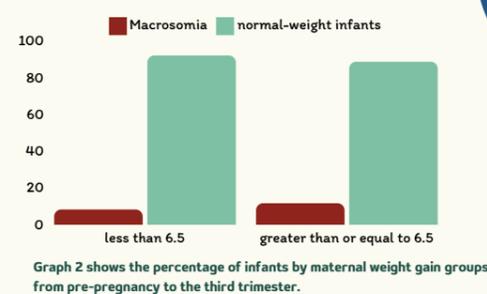
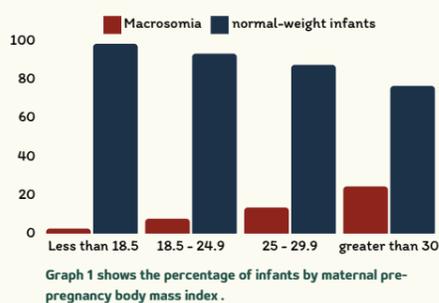


Microsoft Excel



RStudio

## Results



## Result: Multiple Logistic Regression

Variable	OR	(95% CI of OR)	P-value
<b>1. Mothers with a pre-pregnancy BMI</b>			
less than 24.9 kg/m <sup>2</sup>	1.00		
greater than or equal to 24.9 kg/m <sup>2</sup>	3.31	(2.09 - 5.26)	<0.01*
<b>2. history of previous childbirth</b>			
Never	1.00		
Ever	2.40	(1.43 - 4.24)	<0.01*
<b>3. Maternal weight in the 3rd trimester</b>			
Less than 6.5 kilograms	1.00		
greater than or equal to 6.5 kilograms	2.20	(1.39 - 3.52)	<0.01*

## Conclusion

The results of univariate logistic regression analysis showed that maternal pre-pregnancy body mass index (BMI), history of previous childbirth, gestational age at delivery, and maternal weight gain from pre-pregnancy to the third trimester were significantly associated with macrosomia. When these variables with P-values <0.05 were included in a multivariate logistic regression analysis, using maternal BMI as the main factor and other variables as covariates, with statistical significance set at P<0.05 and a 95% confidence interval, the following relationships with macrosomia were found: Mothers with a pre-pregnancy BMI greater than or equal to 24.9 kg/m<sup>2</sup> had a 3.31 times higher risk of delivering macrosomic infants compared to mothers with a BMI less than 24.9 kg/m<sup>2</sup> (P<0.01).

Mothers with a history of previous childbirth had a 2.40 times higher risk of delivering macrosomic infants compared to first-time mothers (P=0.01).

Mothers who gained weight greater than or equal to 6.5 kg from pre-pregnancy to the third trimester had a 2.20 times higher risk of delivering macrosomic infants compared to mothers who gained less than 6.5 kg (P<0.01).

Gestational age at delivery was not found to have a statistically significant relationship with macrosomia (P=0.14).

The study results demonstrate that pre-pregnancy BMI, history of previous childbirth, and weight gain during pregnancy are important factors contributing to macrosomia, with pre-pregnancy BMI greater than or equal to 24.9 kg/m<sup>2</sup> showing the strongest association with macrosomia.

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## References

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