

## Abstract

**Background:** Estimation of fetal weight is an important, challenging aspect of obstetric care. Even with advancements in antenatal ultrasonographic technology, estimation error continues to be a significant problem, especially for macrosomic infants of diabetic mothers.

### Aim of the work

The purpose of this study is to assess the accuracy of fetal weight estimation in macrosomic feti by sonographic measure of fetal cheek-to-cheek diameter.

**Methodology:** Value of fetal cheek- to- cheek diameter in estimation of fetal weight in macrosomic feti. Ain Shams University Maternity Hospital. Accuracy of fetal weight estimation in macrosomic feti by sonographic measure of fetal cheek-to-cheek diameter.

**Results:** The current study was conducted at Ain Shams University Maternity Hospital during the period between 4 January and 30 July 2016.A total of 100 pregnant women were included in the current study.

**Conclusion:** Macrosomic infants showed higher biometric measurements regarding the following: CCD, CCD/BPD, AC, EFW and actual body weight. Regarding infants of diabetic mothers, they had higher CCD, CCD/BPD, AC, EFW and actual body weight.Diabetic patients show higher rate of have macrosomic fetuses than non diabetic patients.

**Recommendations:** For ultrasonographic diagnosis and suspection of macrosomia, many serial scans should be done rather than only one scan. The results obtained in the diagnosis of macrosomia by CCD are discordant. We wait the results of the tridimensional ultrasonography and fetal magnetic resonance imaging (fMRI) in the estimation of fetal weight.

---

**Keywords:** Value of Fetal, Cheek Diameter, Estimation, Fetal Weight, Macrosomic Feti

# Contents

Subjects	Page
List of abbreviations.....	II
List of figures.....	IV
List of tables.....	VI
• <b>Introduction</b> .....	1
• <b>Aim of the Work</b> .....	5
• <b>Review of Literature</b>	
♦ <b>Chapter (1):</b> Pathophysiology of Fetal Overgrowth.....	6
♦ <b>Chapter (2):</b> Estimation of Fetal Weight.....	20
♦ <b>Chapter (3):</b> Fetal Macrosomia .....	44
♦ <b>Chapter (4):</b> Mode of Delivery .....	63
• <b>Patients and Methods</b> .....	73
• <b>Results</b> .....	80
• <b>Discussion</b> .....	93
• <b>Summary</b> .....	101
• <b>Conclusion</b> .....	104
• <b>Recommendations</b> .....	105
• <b>References</b> .....	106
• <b>Arabic Summary</b>	

## List of Abbreviations

Abbrev.	Meaning
AC	Abdominal Circumference
AUC (95% CI)	Area under the curve and its 95% confidence interval
BMI	Body mass index
BPD	Biparietal Diameter
C. S	Cesarean Section
CCD	Cheek to cheek diameter
CRL	Crown-rump length
EFW	Estimated fetal weight
FL	Femur length
g/cm <sup>3</sup>	Gram / cubic centimeter
H	Hour
HC	Head circumference
HL	Humerus length
IDDM	Insulin-dependent diabetes mellitus
IGFBP	Insulin-like growth factor binding protein
IGFs	Insulin-like growth factors
IQR	Interquartile range
IUGR	Intrauterine growth factors
LGA	Large-for-gestational age
LR+	Positive likelihood ratio
mg/dL	Milligram / deciliter
MPD (95% CI)	Mean paired difference and its 95% confidence interval

## *List of Abbreviations*

---

<b>Ng</b>	Nanogram
<b>NIDDM</b>	Noninsulin-dependent diabetes mellitus
<b>NPV</b>	Negative predictive value
<b>PPV</b>	Positive predictive value
<b>PGM</b>	Phosphoglucomutase
<b>ROC</b>	Receiver-operator characteristic
<b>SD</b>	Standard deviation
<b>SGA</b>	Small-for-gestational
<b>US</b>	Ultrasound

## List of Figures

<b><u>No.</u></b>	<b><u>Figure</u></b>	<b><u>Page</u></b>
<b><u>1</u></b>	Neonatal photograph of infant of a diabetic mother.	<b>43</b>
<b><u>2</u></b>	Cheek to cheek diameter	<b>77</b>
<b><u>3</u></b>	ROC Curves for Fetal Biometry and CCD as Predictors of Actual Macrosomia in Included Women.	<b>87</b>
<b><u>4</u></b>	ROC Curves for Fetal Biometry and CCD as Predictors of Birth Weight $\geq$ 90th Percentile in Included Women.	<b>89</b>
<b><u>5</u></b>	ROC Curves for Fetal Biometry and CCD as Predictors of Birth Weight $\geq$ 95th Percentile in Included Women.	<b>91</b>

## **List of Tables**

<b><u>No.</u></b>	<b><u>Table</u></b>	<b><u>Page</u></b>
<b><u>1</u></b>	Ultrasonographic Fetal Biometric Prediction Algorithms for Calculating Estimated fetal Weight	<b>38</b>
<b><u>2</u></b>	Comparison of Published Accuracy of Different Methods for the Prediction of Term Fetal Macrosomia of Greater Than 4000 Grams	<b>40</b>
<b><u>3</u></b>	Accuracy Of Clinical Palpation Versus Sonographic Fetal Biometry For Predicting Actual Birth Weight of Less Than 2500 grams, 2500 – 4000 grams, and Greater then 4000 grams	<b>41</b>
<b><u>4</u></b>	Comparison of Results for Different Methods of Predicting Term Birth Weight: Stud by of 44 Term Patients	<b>42</b>
<b><u>5</u></b>	Newborn and Maternal Complications Associated with Birth Weight of Greater than 4000 grams	<b>49</b>
<b><u>6</u></b>	Demographic Data of Included Women	<b>80</b>
<b><u>7</u></b>	Sonographic Fetal Biometry in Included Women	<b>81</b>
<b><u>8</u></b>	Comparison Regarding Mode of Delivery and Biometric Data of the women	<b>82</b>
<b><u>9</u></b>	Comparison Regarding Diabetic State and Biometric data of the women	<b>83</b>
<b><u>10</u></b>	CCD in Included Women	<b>84</b>
<b><u>11</u></b>	Paired Difference between EFW and Actual Birth Weight in Included Women	<b>84</b>

<b><u>No.</u></b>	<b><u>Table</u></b>	<b><u>Page</u></b>
<b><u>12</u></b>	Agreement between Sonographic Prediction of Macrosomia and Actual Macrosomia in Included Women	<b>85</b>
<b><u>13</u></b>	Correlation between Actual Birth Weight and Both Fetal Biometry and CCD in Included Women	<b>86</b>
<b><u>14</u></b>	Area under the ROC Curves for Fetal Biometry and CCD as Predictors of Actual Macrosomia in Included Women	<b>88</b>
<b><u>15</u></b>	Validity of Fetal Biometry and CCD as Predictors of Actual Macrosomia in Included Women	<b>88</b>
<b><u>16</u></b>	Area under the ROC Curves for Fetal Biometry and CCD as Predictors of Birth Weight $\geq$ 90th Percentile in Included Women	<b>90</b>
<b><u>17</u></b>	Validity of Fetal Biometry and CCD as Predictors of Birth Weight $\geq$ 90th Percentile in Included Women	<b>90</b>
<b><u>18</u></b>	Area under the ROC Curves for Fetal Biometry and CCD as Predictors of Birth Weight $\geq$ 95th Percentile in Included Women	<b>92</b>
<b><u>19</u></b>	Validity of Fetal Biometry and CCD as Predictors of Birth Weight $\geq$ 95th Percentile in Included Women	<b>92</b>



---

# Protocol

---







---

# Introduction

---





---

# **Aim of the Work**

---





---

# **Review of Literature**

---





---

## ***CHAPTER (I)***

# **Pathophysiology of Fetal Overgrowth**

---





---

## ***CHAPTER (II)***

# **Estimation of Fetal Weight**

---





---

## ***CHAPTER (III)***

# **Fetal Macrosomia**

---





---

## ***CHAPTER (IV)***

# **Mode of Delivery**

---

