Original Articles

Comparison of the Accuracy of Fetal Weight Estimation Using Clinical and Sonographic Methods

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Objectives : *1. To compare the accuracy of clinical and sonographic estimations of fetal weight in pregnant women.*
2. To determine the contributing factors that may affect the accuracy of these two methods.
Study design : *Prospective study.*
Material and Method : *297 pregnant women who were admitted at labor room, Siriraj Hospital during the period of January 6 to February 26, 2004 were enrolled. The fetal weight was estimated clinically by the physicians, then blindly followed by sonographic estimation within 24 hours before delivery. The mean absolute error was calculated from the absolute of the difference between the estimated fetal weight and the actual birth weight of each method. Main outcome measurements were simple error, absolute error, absolute percentage error, and accuracy within 10% of actual birth weight.*
Results : *The accuracy of clinical estimation of fetal weight was similar to sonographic estimation. The accuracy within 10% of both methods were 66.7 (95%CI 61.3, 72.0) and 65.3 (95%CI 60.1, 71.0), respectively. The estimation by both methods tend to be underestimated with the mean of absolute error 264.7 $\pm$ 299.6 and 265.0 $\pm$ 236.3 grams,respectively, and the mean of percentage error 9.0 $\pm$ 9.7 and 8.6 $\pm$ 6.9 % of actual birth weight. The accuracy amongst possible contributing factors were compared and analyzed. The only one factor effect the accuracy significantly was actual birth weight < 2,500 grams in clinical estimation ($P < 0.05$). Sensitivity and specificity for prediction of birth weight lower than 2,500 grams was 82.6, 94.2% by clinical and 64.4, 97.6% by sonographic estimation. The positive predictive value and negative predictive value of both methods were 54.3, 98.5% and 82.9, 93.9%, respectively, while the efficacy was 93.3 and 92.6%.*
Conclusions : *Intrapartum clinical estimation of fetal weight was accurate as sonographic estimation, while the mean of error in grams or in percentage of birth weight were indifferent. The low-birth weight influenced the accuracy of clinical estimation significantly. However, clinical estimation is good enough for screening of the low-birth weight because of its high sensitivity and negative predictive value.*

Keywords : *Estimated fetal weight,Clinical estimation of fetal weight, Sonographic estimation of fetal weight.*

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Intrapartum estimation of fetal weight is still the topics of interest because abnormalities of labor and neonatal complications may be associated with different size of birth weight. Perinatal mortality, an important indicator in obstetric care, is the result of stillbirths and neonatal deaths. The low-birth weight is a major cause of neonatal death and poor neonatal outcomes. Accurate estimated fetal weight (EFW) will be helpful in planning of management, counseling on the likelihood of survival, optimal route of delivery, or level of hospital where the delivery should be occurred.

The two main methods for predicting birth weight (BW)[1-9] are clinical and sonographic estimations with different accuracy. The clinical estimation [1-11], based on abdominal palpating of fetal parts and fundal height, although easy and inexpensive that more helpful in developing countries but subjectively and no standard technique. The sonographic estimation[1-9,12-16], measurement of various fetal dimensions particularly biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC), femur

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length (FL), then calculated by various equations, superior to clinical estimation in detecting abnormalities of fetus, amniotic fluid, and placenta but still needs instruments and well trained physicians.

The previous study in Thailand[4,12,16] comparing accuracy of clinical and sonographic estimations concluded that accuracy of clinical EFW by residents was not different from sonographic EFW but significantly more accurate than clinical estimation by externs. If we concentrated to birth weight especially in low weight group it had been found that when clinical estimation was less than 2,500 grams, sonographic estimation should be performed for increasing accuracy. There were also many other contributing factors that may effect accuracy of estimation, for example: maternal body mass index (BMI), rupture of membranes, placental site or amniotic fluid volume which were also been studied by several investigators but the results were still inconclusive[2-4,6-9].

The objective of this prospective study was 1) to compare the accuracy of clinical and sonagraphic EFW in intrapartum patients. 2) to determine the contributing factors that may effect the accuracy of these two methods.

Material and Method

(The sample size was calculated by 60 cases pilot study: Accuracy of clinical estimation was 69.9% VS 63.0% by sonographically, equivalence limit 10%, type I error 0.01, power 95%, n = 245, lost data 20%, total ~ 294).

This prospective study consisted of two hundred ninety-seven women admitted for delivery in labor room, Department of Obstetrics and Gynecologists, Siriraj Hospital, Mahidol University, from January 6 to February 26, 2004 with the approval of the institutional ethic committee. The inclusion criteria were 1) singleton pregnancy 2) admission for planned delivery or in early labour 3) gestational age beyond 28 complete weeks by last menstrual period or sonographic dating. The exclusion criteria were 1) intrauterine fetal death 2) known fetal anomaly and 3) pregnancy with uterine or adnexal pathology. After the patients were enrolled, their characteristic data were recorded. The admitting physician from one of the five researchers (3 externs and 2 residents) made a clinical estimation of fetal weight (expressed in grams). The clinical weight estimation was based on palpation of the fetal parts through the maternal abdomen using the Leopold maneuver alone. The measurement was recorded on a research card, which was not kept with the subject's chart. In addition, standard sonographic measurement of BPD, HC, AC and FL, using TOSHIBA model USBO 221A / S1A with 3.75 MHz convex probe, was performed by one of the another two well trained residents and the estimated fetal weight using Shepard' equation was recorded. These two residents had no record of the former clinical estimated weight and every methods of estimation were blinded from each other. The two assessments of birth weight were not compared during the study period.

All neonates were weighed within 30 minutes after delivery on the same metric scale, and infant weight was recorded to the nearest grams (g). Those who were not delivered within 24 hours after estimation were not included for analysis.

Statistical analysis

After completion of the study, continuous data were analyzed and presented as mean (standard deviation), and categorical variables were presented as count and percentage. The clinical and sonographic EFW were compared with the actual weight with respected to the followings: 1) mean of simple error (EFW-BW), 2) mean of absolute error (absolute value of [EFW-BW]), 3) mean of absolute percentage error (%) (absolute value of [EFW-BW] x 100/BW), and 4) ratio (%) of estimates within 10% of actual birth weight (true when absolute percentage error was not more than 10%). Statistical analysis was performed using Chi Square test and McNemar test. $P < 0.05$ was considered significant.

Results

Two hundred and ninety-seven from three hundred and five pregnant women were studied. The rest were excluded because of non delivery within twenty four hours and missing data.

The characteristics of 297 patients were shown in Table 1. The mean age was 26.4 $\pm$ 8.2 years, gestational age (GA) 38.5 $\pm$ 2.5 weeks (wks) and 82.5 percent of cases were term pregnancy. The parous and non-parous groups were found in the similar number. The mean BMI was 26.6 $\pm$ 3.7, the percentages of under weight (<19.8), normal weight (19.8-26), overweight (26.1-29.0), and obese groups (>29) were 1.0, 47.2, 31.6, and 20.2, respectively.

The fetus with head presentation was found in 96% and 70.7% had already engaged. Sixty six percent was in latent phase. The percentage of intact membranes and normal AFI were 75.1 and 90.9, respectively. The mean actual birth weight was 2,979.9 $\pm$ 471.3

Table 1. The demographic data of studying population (297 cases)

	Mean ± SD	Range	Group	Numbers	%
Age	26.4 ± 8.2	15-42	≤17	15	5.1
(years)			18-34	254	85.5
			≥35	28	9.4
Gravida	1.7 ± 1.0	1-5	0	152	51.2
			≥1	145	48.8
Para	0.6 ± 0.8	0-4	0	177	59.6
			≥1	120	40.4
BMI	26.6 ± 3.7	18.4-38.8	<19.8	3	1.0
			19.8-26.0	140	47.2
			26.1-29.0	94	31.6
			>29	60	20.2
GA	38.5 ± 2.5	28-42	<37	52	17.5
(weeks)			≥37	245	82.5

g. (range 1,340-4,240 g.) and 90.9% were within normal birth weight range (Table 2).

On estimating the fetal weight by clinic and sonography, it was found that the mean (SD) of simple error were -31.7 (398.8 g) and -152.7 (320.8 g), respectively. It meant that the estimations by each method seemed to be in the underestimated direction (negative value). The mean of absolute error were 264.7 (299.6 g) and 265.0 (236.3 g), respectively. The mean of absolute percentage error were 9.0 (9.7)% and 8.6 (6.9)%, respectively. The accuracy within 10% of actual birth weight in both methods were 66.7 (95% CI 61.3, 72.0) and 65.3% (95% CI 60.1, 71.0) (Table 3).

There were many contributing factors affecting fetal weight estimation (Table 4,5) e.g. maternal age, number of pregnancy, BMI, gestational age, presenting part, stage of labor, status of membranes, AFI, placental site, or physician's experience. Although some factors such as engagement (only in sonographic estimated method), gestational age lesser than 37 wks (only in clinical estimated method), or low-birth weight group that might be the possible related factors, but only birth weight of lower than 2,500 g (estimated by clinical method) was significant ($P < 0.05$) while the others were not ($P = 0.082, 0.094$).

In low-birth weight group, accuracy within 10% of actual BW in clinical EFW was 48.6% (95%CI 32.0, 65.1) compared with 60.0% (95%CI 43.8, 76.2) in sonographic EFW ($P = 0.424$).

The clinical prediction in the low-birth weight group (<2,500 g) was usually lower than actual weight. As shown in Table 6, it was found that the sensitivity and specificity of the clinical and ultrasonographic estimations were 82.6, 94.2% and 64.4, 97.6%, respectively. The positive predictive value (PPV) and negative predictive value (NPV) of both methods were 54.3, 98.5% and 82.9, 93.9%, respectively, while the efficiency was 93.3 and 92.6%.

Discussion

The estimation of intrauterine fetal weight is the vital component of important correlated factors

Table 2. Obstetric data of studying population (297 cases)

	Group	Numbers	%
Presentation	head	285	96.0
	others	12	4.0
Position	left	230	77.4
	right	67	22.6
Engagement	no	87	29.3
	yes	210	70.7
Dilatation (cm.)	0-2	196	66.0
	3-4	86	29.0
	4-6	15	5.0
Station (-3 to +3)	-3 to -1	14	4.7
	0	62	20.9
	+1 to +2	221	74.4
Membranes	intact	223	75.1
	ruptured	74	24.9
Placenta	anterior	169	56.9
	posterior	101	34.0
	lateral	27	9.1
AFI	oligohydramnios	27	9.1
	normal	270	90.9
Sex	female	173	58.2
	male	124	41.8
Physicians	extern	145	48.8
	resident	152	51.2
Birth Weight (grams)	<2,500	23	7.7
2,979.9 ± 471.3	2,500-4,000	270	90.9
(1,340-4,240)*	>4,000	4	1.4

* mean ± SD (range)

Table 3. Relative accuracy of clinical and sonographic estimates birth weight

	Clinical estimation Mean (SD)	Sonographic estimation Mean (SD)
Simple error (grams)	-31.7 (398.8)	-152.7 (320.8)
Absolute error (grams)	264.7 (299.6)	265.0 (236.3)
Absolute percentage error (%)	9.0 (9.7)	8.6 (6.9)
Accuracy within 10% of actual BW	66.7 (95%CI 61.3,72.0)	65.3 (95%CI 60.1,71.0)*

* P = 0.771 (McNemar test) no statistically significant

Table 4. Accuracy within 10% of actual BW in subset of possible contributing factors in clinical estimation

		Numbers	Clinical accuracy	P-value
Age (yrs)	≤17	15	80.0	0.431
	18-34	254	65.4	
	≥35	28	71.4	
Gravida	0	152	66.4	1.000
	≥1	145	66.9	
Parity	0	177	67.2	0.900
	≥1	120	65.8	
BMI	<19.8	3	33.3	0.380
	19.8-26.0	140	66.4	
	26.1-29.0	94	71.3	
	>29	60	61.7	
GA (wks)	<37	52	55.8	0.094
	≥37	245	69.0	
Presentation	head	285	67.0	0.755
	others	12	58.3	
Position	left	230	65.2	0.404
	right	67	71.6	
Engagement	no	87	63.2	0.499
	yes	210	68.1	
Dilatation	0-2	196	69.4	0.217
	3-4	86	59.3	
	>4	15	73.3	
Station	-3 to -1	14	71.4	0.869
	0	62	64.5	
	+1 to +2	221	67.0	
Membranes	intact	223	62.2	0.420
	ruptured	74	68.2	
Placenta	anterior	169	66.3	0.860
	posterior	101	68.3	
	lateral	27	63.0	
AFI	Oligo.	27	63.0	0.830
	normal	270	67.0	
Physicians	extern	145	60.0	0.391
	resident	152	67.9	
Sex	female	173	66.5	1.000
	male	124	66.9	
Birth weight (grams)	<2,500	23	48.6	0.026*
	≥2,500	274	69.1	*P<0.05

Table 5. Accuracy within 10% of actual BW in subset of possible contributing factors in sonographic estimation

		Numbers	Sonographic accuracy	P-value
Age (yrs)	≤17	15	53.3	0.207
	18-34	254	64.8	
	≥35	28	78.6	
Gravida	0	152	69.7	0.150
	≥1	145	61.1	
Parity	0	177	67.2	0.534
	≥1	120	63.0	
BMI	<19.8	3	66.7	0.999
	19.8-26.0	140	65.7	
	26.1-29.0	94	64.9	
	>29	60	66.1	
GA (wks)	<37	52	61.5	0.611
	≥37	245	66.4	
Presentation	head	285	65.5	1.000
	others	12	66.7	
Position	left	230	73.6	0.864
	right	67	62.2	
Engagement	no	87	65.1	0.082
	yes	210	67.2	
Dilatation	0-2	196	65.1	0.809
	3-4	86	65.1	
	>4	15	73.3	
Station	-3 to -1	14	50.0	0.311
	0	62	71.0	
	+1 to +2	221	65.0	
Membranes	intact	223	67.1	0.852
	ruptured	74	65.0	
Placenta	anterior	169	61.9	0.321
	posterior	101	70.3	
	lateral	27	70.4	
AFI	Oligo.	27	66.7	1.000
	normal	270	65.4	
Sex	female	173	68.0	0.350
	male	124	62.1	
Birth Weight (grams)	<2,500	23	60.0	0.586
	≥2,500	274	66.3	

for the management of labor and delivery and many decisions are influenced by this measurement, especially those involving fetuses in breech presentation or suspicious of having macrosomia. As fetal weight cannot be measured directly, it must be estimated from fetal or maternal anatomic characteristics and until now the clinical and sonographic estimations[1-9] are only two worldwide methods used in many centers.

Clinical estimation[1-11] by external palpation of fetal parts and uterine contour is easy to practice, inexpensive and reliable so that 69% of estimation falls within 10% of actual birth weight. There are many clinical methods, such as symphysis-fundal height or abdominal girth, but no supported data of any superior techniques over abdominal palpation using Leopold maneuver[10,11].

Sonographic estimation, although is widely used[1-9,12-16] but sometime inconvenient because of the cost, acquirement of instrument and well trained physicians. Many different formulas for predicting fetal weight[12-16] were used and there are many studies comparing accuracy of those formulas but it is still inconclusive. In this study, Shepard formula was chosen because of its popularity in Thailand and similar accuracy as Hadlock formula[4,14,16].

Although the results of this study (Table 3) revealed that the accuracy within 10% of actual BW in clinical estimated fetal weight (EFW) was slightly higher than sonographic EFW (66.7 and 65.5%) but the difference of the accuracy was insignificant. The prediction of birth weight of both methods seemed to be underestimated. The mean error of both methods were about 265 g. (264.7 and 265.0 g.) or ~9% of the actual weight which were also similar to the other studies[1-5]. So it may conclude that the accuracy of estimation using instrument was not better than simple abdominal palpation and errors were also indifferent. In developing country, clinical estimation is still useful and should be done first and limit sonographic study only in cases with another indications.

The possible factors that may affect EFW [2-4,6-9], e.g. maternal age, number of pregnancy, BMI, presenting part, stage of labor, status of membranes, site of placental implantation, AFI, fetal sex, even experience of physicians were insignificant factors that effected errors of estimations in both clinical and sonographic EFW (Table 4,5).

Normally, clinical EFW should be done easily and with good accuracy in parous from relaxation of abdominal wall. Insignificant result in this study was because of lack of grand multiparity in this study population (Table 4).

In patients with higher BMI, clinical estimation was uneasy because fetal parts may be palpated with difficulty. Sonographic EFW may has more accurate because it was not influenced by BMI[6,7]. The result in this study revealed that BMI had no effect on EFW, even BMI > 29, accuracy within 10% of clinical EFW was about 61.7% (Table 4,5).

In preterm group, clinical EFW may have lower accuracy because of small fetal parts and large amount of amniotic fluid. Even this study revealed that the accuracy within 10% of clinical EFW in preterm group (55.8%) was still lower than those of term group (69.0%) but without statistical significant. Further study with larger population should be done for more information (Table 4).

Status of membranes[8,9] and engagement of presenting part may affect EFW because it is difficult to palpate or measure fetal parts. The study revealed that they were insignificant factors. Remarking that when estimate sonographically, the accuracy within 10% in unengaged group (73.6%) was higher than engaged group (62.2%) (Table 4,5).

Anterior placental implantation may cause difficulty in palpating the fetal parts in clinical EFW but the result was insignificant. Polyhydramnios may also affect clinical EFW but there were no such cases in this study (Table 4).

The experience of physicians in clinical estimation should be the important factor contributing accuracy within 10% of clinical EFW[4,5], but was not true in this study. The possible reason was depended on the individual experience of the researchers. Even limited researchers in this study, but the uncontrolled intraobserver and interobserver variations may also affect accuracy of EFW. This may be the weakest point of this study. The further larger population should be performed before conclusion.

Only one significant factor of using abdominal palpation that reduced its accuracy is actual birth weight in low weight group. The accuracy within 10% of sonographic estimation was 60.0% (95%CI 43.8, 76.2) which was better than that of clinical estimation (48.6% [95%CI 32.0, 65.1]), but the sample size was too small to be concluded (P = 0.424). The results are the same as the other studies[2-4]. Further study with larger population should be done for more information. The accuracy in the groups that birth weight more than 4,000 g. not been yet concluded because of not enough cases.

Efficiencies for detection of low actual birth weight of both methods were similar (Table 6). Clinical estimation has more percentages of sensitivity and negative predictive value while specificity and positive predictive value is lower. It means that clinical estimation in screening for low actual birth weight is better. Higher NPV means that in cases of clinical EFW more than 2,500 g, chance of delivery of infants with birth weight less than 2,500 g is low. However, in suspicious cases combination of sonographic measurement may helpful for increasing of the specificity and PPV.

Clinical estimation of fetal weight was as accurate as sonographic estimation, while the mean of error in grams or in percentage of birth weight were

Table 6. Efficiency of Clinical and Sonographic Estimations in Prediction of Birth Weight < 2,500 g

	Clinical estimation	Sonographic estimation
Sensitivity	82.6	64.4
Specificity	94.2	97.6
Positive predictive value	54.3	82.9
Negative predictive value	98.5	93.9
Test efficiency	93.3	92.6

indifferent. The low-birth weight influenced the accuracy within 10% of clinical estimation significantly. Beside this, clinical estimation is good enough for screening of the low-birth weight from its high sensitivity and negative predictive value.

Conclusion

Clinical estimation of fetal weight is one of important and necessary skills in management of obstetric patients because of its simplicity. This method is as accurate as sonographic measurement in intrapartum patients (66.7% [95% CI 61.3, 72.0]) vs 65.3% [95% CI 60.1, 71.0]) and also good enough for screening of the low-birth weight from its high sensitivity and negative predictive value.

References

1. Chauhan SP, Lutton PM, Bailey KJ, Guerrieri JP, Morrison JC. Intrapartum clinical, sonographic, and parous patients' estimates of newborn birth weight. Obstet Gynecol 1992; 79: 956-8.
2. Sherman DJ, Arieli S, Tovbin J, Siegel G, Caspi E, Bukovsky I. A comparison of clinical and ultrasonic estimation of fetal weight. Obstet Gynecol 1998; 91: 212-7.
3. Chauhan SP, Hendrix NW, Magann EF, Morrison JC, Kenney SP, Devoe LD. Limitations of clinical and sonographic estimates of birth weight: experience with 1034 parturients. Obstet Gynecol 1998; 91: 72-7.
4. Titapant V, Chawanpaiboon S, Mingmitpatanakul K. A comparison of clinical and ultrasound estimation of fetal weight. J Med Assoc Thai 2001; 84: 1251-7.
5. Baum JD, Gussman D, Wirth JC III. Clinical and patient estimation of fetal weight vs. ultrasound estimation. J Reprod Med 2002; 47: 194-8.
6. Field NT, Piper JM, Langer O. The effect of maternal obesity on the accuracy of fetal weight estimation. Obstet Gynecol 1995; 86: 102-7.
7. Farrell T, Holmes R, Stone P. The effect of body mass index on three methods of fetal weight estimation. Br J Obstet Gynecol 2002; 109: 651-7.
8. Barnhard Y, Bar-Hava I, Divon MY. Accuracy of intrapartum estimates of fetal weight. effect of oligohydramnios. Reprod Med 1996; 41: 907-10.
9. Blann DW, Prien SD. Estimation of fetal weight before and after amniotomy in the laboring gravid woman. Am J Obstet Gynecol 2000; 182: 1117-20.
10. Kenneth RN, Vincent JC, Russel JC. Estimation of birth weight by quantified external uterine measurement. Obstet Gynecol 1970; 36: 294-8.
11. Mongelli M. Fetal weight estimation by symphysis-undal height and gestational age. Gynecol Obstet Invest 1997; 43: 20-4.
12. Tongsong T, Piyamongkol W, Sreshthaputra O. Accuracy of ultrasonic fetal weight estimation: a comparison of three equations employed for imating fetal weight. J Med Assoc Thai 1994; 77: 373-6.
13. McLaren RA, Puckett JL, Chauhan SP. Estimators of birth weight in pregnant women requiring insulin: a comparison of seven sonographic models. Obstet Gynecol 1995; 85: 565-9.
14. Chien PF, Owen P, Khan KS. Validity of ultrasound estimation of fetal weight. Obstet Gynecol 2000; 95: 856-60.
15. Venkat A, Chinnaiya A, Gopal M, Mongelli JM. Sonographic fetal weight estimation in a south-east Asian population. J Obstet Gynecol Res 2001; 27: 275-9.
16. Ratanasiri T, Somboonporn W, Patumnakul P, Jirapornkul S, Seejorn K. Comparison of the accuracy of ultrasonic fetal weight estimation by using the various equations. J Med Assoc Thai 2002; 85: 962-6.

การเปรียบเทียบความแม่นยำในการคะเนน้ำหนักทารกในครรภ์ด้วยการตรวจทางคลินิกและการตรวจด้วยเครื่องอัลตราซาวนด์

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วัตถุประสงค์ *: 1. เพื่อเปรียบเทียบความถูกต้องในการคะเนน้ำหนักทารกในครรภ์ด้วยการตรวจทางคลินิกและการตรวจ ด้วยเครื่องอัลตราซาวนด์*

2. เพื่อศึกษาปัจจัยที่อาจมีผลต่อความถูกต้องของการคะเนน้ำหนักทารกโดยวิธีดังกล่าว

ชนิดของการวิจัย *: การวิจัยชนิดติดตามผล (โปรเสปคทีฟ)*

วัสดุและวิธีดำเนินการวิจัย *: กลุ่มศึกษาคือสตรีตั้งครรภ์จำนวน 297 ราย ที่รับไว้ในห้องคลอด โรงพยาบาลศิริราช ตั้งแต่วันที่ 6 มกราคม ถึงวันที่ 26 กุมภาพันธ์ พ.ศ. 2547 โดยสตรีตั้งครรภ์เหล่านั้นจะได้รับการคะเนน้ำหนักทารกในครรภ์ด้วยการตรวจทางคลินิกโดยแพทย์ และโดยใช้เครื่องอัลตราซาวนด์ ในระยะเวลาไม่เกิน 24 ชั่วโมงก่อนคลอดโดยแพทย์อีกคนหนึ่ง ทั้งนี้แพทย์ผู้ตรวจทุกคนจะไม่ทราบผลการคะเนน้ำหนักทารกในครรภ์ของอีกวิธีเลย และเปรียบเทียบน้ำหนักที่คะเนไว้กับน้ำหนักแรกคลอดของทารกคนนั้น นำไปคำนวณหาค่ากลางสมบูรณ์ของแต่ละวิธี หาค่าความผิดพลาดและความผิดพลาดสมบูรณ์ในการคะเนน้ำหนักทารกในครรภ์, ร้อยละของความผิดพลาดและสัดส่วนของการคะเนน้ำหนักทารกในครรภ์ที่ถูกต้องภายในร้อยละ 10 ของน้ำหนักแรกเกิด*

ผลการวิจัย *: การคะเนน้ำหนักทารกในครรภ์โดยการตรวจทางคลินิกมีความแม่นยำใกล้เคียงกับการตรวจด้วยเครื่องอัลตราซาวนด์ โดยมีความถูกต้องร้อยละ 66.7 (ช่วงความเชื่อมั่นร้อยละ 95 61.3, 72.0) และ 65.3 (ช่วงความเชื่อมั่นร้อยละ 95 60.1, 71.0) ตามลำดับ การคะเนน้ำหนักทั้งสองวิธีมีแนวโน้มที่จะคะเนต่ำกว่าน้ำหนักจริง โดยมีความผิดพลาดโดยเฉลี่ย 264.7 $\pm$ 299.6 และ 265.0 $\pm$ 236.3 กรัมตามลำดับ หรือเทียบได้กับร้อยละ 9.0 $\pm$ 9.7 และร้อยละ 8.6 $\pm$ 6.9 ของน้ำหนักแรกเกิด เมื่อได้เปรียบเทียบในกลุ่มปัจจัยต่างๆ ที่อาจมีผลต่อความแม่นยำในการคะเนแล้ว ในกลุ่มที่มีน้ำหนักแรกเกิดต่ำกว่า 2,500 กรัม การคะเนน้ำหนักทารกด้วยการตรวจทางคลินิกมีความแม่นยำลดลงอย่างมีนัยสำคัญ (ค่าพี น้อยกว่า 0.05) ในการคะเนน้ำหนักแรกเกิดต่ำกว่า 2,500 กรัมด้วยการคะเนน้ำหนักทารกพบว่ามีความไวและความจำเพาะร้อยละ 82.6 และ ร้อยละ 94.2 โดยการตรวจทางคลินิก ร้อยละ 64.4 และร้อยละ 97.6 โดยการตรวจด้วยเครื่องอัลตราซาวนด์ ค่าการพยากรณ์บวกและลบเท่ากับร้อยละ 54.3 และ ร้อยละ 98.5 โดยการตรวจทางคลินิก เท่ากับร้อยละ 82.9 และร้อยละ 93.9 หากตรวจด้วยเครื่องอัลตราซาวนด์ โดยมีประสิทธิผลเป็นร้อยละ 93.3 และร้อยละ 92.6 ตามลำดับ*

สรุป *: การคะเนน้ำหนักทารกโดยการตรวจทางคลินิกในผู้ป่วยระยะคลอด มีความแม่นยำใกล้เคียงกับการตรวจด้วยเครื่องอัลตราซาวนด์ โดยมีความผิดพลาดเฉลี่ยใกล้เคียงกันทั้งน้ำหนักค่ากลางเป็นกรัม หรือร้อยละของน้ำหนักแรกเกิด การคะเนน้ำหนักทารกโดยการตรวจทางคลินิกในกลุ่มที่มีน้ำหนักแรกเกิดต่ำกว่า 2,500 กรัม มีความแม่นยำลดลงอย่างมีนัยสำคัญ (ค่าพีน้อยกว่า 0.05) อย่างไรก็ตาม การคะเนน้ำหนักทารกโดยการตรวจทางคลินิกมีความแม่นยำในการคัดกรองภาวะน้ำหนักแรกเกิดต่ำ เนื่องจากค่าความไวและค่าการพยากรณ์บวกสูงกว่าการตรวจด้วยเครื่องอัลตราซาวนด์*