Fetal Biometry Charts for Normal Pregnant Women in Northeastern Thailand

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Objectives: *1) To construct normal fetal biometry charts of fetal biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC), and femur length (FL) from 14 to 41 weeks of gestation in northeastern Thailand. 2) To compare the results with other studies.*
Study design: *A cross sectional descriptive study.*
Setting: *Division of Fetal Diagnosis and Therapy, Department of Obstetrics and Gynecology, Faculty of Medicine, Srinagarind Hospital, Khon Kaen University.*
Material and Method: *The fetuses of 635 pregnant women with an uncomplicated singleton pregnancy between 14 and 41 weeks of gestation in northeastern Thailand from 1 October 2005 to 31 December 2006. All recruited pregnant women enrolled had an abdominal ultrasonography for fetal biometry and the results were compared with other studies using student's T distribution.*
Main outcome measures: *Fetal biometry charts for normal pregnant women between 14 and 41 weeks of gestation in northeastern Thailand.*
Results: *Six hundred and twenty eight normal fetuses from 635 pregnant women were measured for fetal biometry charts. The comparison of the presented charts with others was significantly larger than the North in all parameters (except AC), but was consistent to those from the South (only BPD and FL). However, when the authors compared then with central Thailand and Western countries, there were only significant differences in some gestational ages.*
Conclusion: *The authors established normal fetal biometry charts for northeastern Thai pregnant women that could be implemented in the population of this region.*

Keywords: *Ultrasound, Fetal biometry, Northeastern Thailand*

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In obstetric practice, there is no doubt that an accurate gestational age of the fetuses will favorably influence management, perinatal mortality, and morbidity. Ultrasound has been proven useful and accurate in determining gestational age of the fetus[1-3].

Many of the existing reference ranges for fetal biparietal diameter (BPD), head circumference (HC), abdominal circumference (AC) and femur length (FL) had been reported by a number of investigators but the results showed biological variation in different populations[4]. In addition, only a little comparable information using statistics has been published[5].

Taksaphan et al[6] compared birth weight in Northeast with those who lived in Bangkok Thailand and found that birth weight in Northeast was lower than those in Bangkok. According to the results of that study, the authors assumed that fetal parameters of northeastern Thailand might be different from other regions of Thailand.

The objectives of the present study were to construct normal fetal biometry charts of fetal biparietal

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Table 1. Mean, standard deviation and percentile for gestational age of northeastern Thai fetal biparietal diameter

GA (wks)	Sample size (n)	Mean BPD (mm)	SD	Percentile				
				5th	10th	50th	90th	95th
14	12	28.75	0.95	27.39	27.72	28.90	29.96	30.00
15	11	32.09	2.06	29.15	29.60	32.00	33.30	34.80
16	11	34.85	3.04	29.40	29.50	35.90	37.10	37.90
17	13	39.96	3.51	34.42	36.32	40.60	43.16	43.52
18	16	42.00	1.73	39.60	40.00	41.70	44.45	44.85
19	20	43.69	3.46	38.26	40.30	44.05	47.61	47.72
20	14	48.86	2.40	46.31	46.90	48.05	52.59	53.47
21	11	50.09	3.24	45.95	46.20	49.80	53.60	55.00
22	12	53.25	2.09	50.29	51.11	53.30	55.08	56.05
23	15	56.53	3.14	51.88	52.48	57.10	60.34	61.42
24	13	59.05	2.55	55.52	55.90	59.40	60.98	62.56
25	15	64.98	4.97	60.77	61.78	63.90	67.06	71.21
26	20	63.66	3.79	58.02	58.37	63.40	68.45	68.98
27	19	67.81	2.71	64.31	64.64	67.20	71.66	72.36
28	23	71.25	4.61	64.25	65.38	72.00	76.14	76.49
29	23	73.52	2.68	69.54	70.82	74.90	76.08	76.46
30	26	77.93	3.79	71.38	72.10	78.00	81.95	82.68
31	29	79.38	3.98	72.04	73.84	79.90	84.26	84.56
32	31	81.58	3.91	73.80	78.20	82.10	86.10	87.20
33	32	82.31	2.66	79.33	79.91	82.50	86.08	86.52
34	31	84.02	3.77	79.90	80.00	81.80	89.40	89.50
35	33	87.50	2.26	84.52	85.10	88.20	90.08	90.10
36	31	88.34	2.69	84.40	84.50	89.60	91.00	91.10
37	29	88.81	3.09	84.68	85.58	88.10	92.86	93.28
38	31	90.31	2.87	86.70	87.40	89.70	93.60	95.45
39	35	91.63	3.46	87.05	87.60	90.90	95.72	96.47
40	35	95.29	4.34	88.80	89.90	94.60	100.46	101.13
41	37	92.70	3.04	88.92	89.82	93.00	96.08	96.60

diameter (BPD), head circumference (HC), abdominal circumference (AC), and femur length (FL) from 14 to 41 weeks of gestation in northeastern Thailand and to compare these values with values from other parts of the country and Western countries.

Material and Method

The present study was a cross sectional with prospective data collection of uncomplicated pregnant women between 14 and 41 weeks of gestation who attended the antenatal care clinic from 1 October 2005 to 31 December 2006 at Srinagarind Hospital, Department of Obstetrics and Gynecology, Faculty of Medicine, Khon Kaen University. Each pregnancy was singleton. The history of regular menstruation, with the exact date of the last menstrual period or first trimester ultrasound examination, was also noted to confirm the actual gestational age. The authors excluded pregnancies complicated by hypertension, pre-eclampsia, thyrotoxicosis, or diabetes mellitus, pregnancies involving fetuses with congenital malformation, chromosomal abnormality, or intrauterine growth restriction, and fetuses which, after birth, were small or large based on gestational age.

The present study was approved by the Khon Kaen University Ethics Committee for Human Research. The date of ultrasonographic measurement was randomly assigned so that approximately equal numbers were measured at each week of gestation. Written informed consent was obtained from all participants. Participants were interviewed to assess maternal age, address, the last menstrual period, contraception, underlying disease, ultrasound in the first trimester, and factors that might cause abnormal fetal growth.

The authors used a convex, 3.5 MHz abdominal transducer of Logic 5 Expert ultrasound machine at the Division of Fetal Diagnosis and Therapy, Department of Obstetrics and Gynecology. Fetal biparietal diameter(BPD), head circumference (HC), abdominal circumference(AC) and femur length(FL) were measured by conventional standard methods[2,3,7].

All measurements were done once, by one operator, to avoid the possible effect of interobserver

Table 2. Mean, standard deviation and percentile for gestational age of northeastern Thai fetal head circumference

GA (wks)	Sample size (n)	Mean HC (mm)	SD	Percentile				
				5th	10th	50th	90th	95th
14	12	105.65	5.55	97.66	98.70	106.55	111.59	112.19
15	11	122.46	9.28	112.65	115.60	124.10	128.50	129.50
16	11	127.81	9.36	112.00	114.60	128.60	135.40	138.30
17	13	148.04	14.11	129.44	135.46	149.10	163.62	164.80
18	16	157.36	5.77	148.65	149.95	156.10	165.60	168.60
19	20	160.78	15.47	131.42	138.21	165.00	172.32	174.11
20	14	181.71	12.26	166.76	168.55	181.55	197.12	199.76
21	11	191.85	13.75	174.85	179.30	189.70	210.80	211.90
22	12	197.88	5.48	189.24	190.98	197.50	204.14	207.84
23	15	210.15	8.38	195.13	197.60	213.60	219.64	221.53
24	13	224.50	8.43	212.44	212.98	226.60	233.38	235.08
25	15	240.85	18.56	222.65	225.10	240.20	249.54	266.93
26	20	238.66	10.39	224.99	227.31	240.70	251.41	251.55
27	19	253.75	8.46	245.21	247.54	253.80	259.74	262.35
28	23	260.09	12.69	238.83	249.14	257.10	277.34	281.60
29	23	263.07	7.58	251.61	253.08	263.90	272.16	273.39
30	26	281.50	13.03	259.35	263.50	285.00	295.90	299.20
31	29	290.46	9.54	276.48	276.84	292.00	300.72	301.74
32	31	292.56	11.19	274.60	277.20	293.90	302.10	303.80
33	32	294.75	7.86	282.25	284.35	294.40	304.09	305.85
34	31	297.98	9.66	284.30	285.50	297.90	310.20	311.70
35	33	312.65	7.07	302.10	303.50	315.10	319.90	320.62
36	31	316.19	10.20	301.80	303.60	317.80	330.20	331.50
37	29	318.26	10.71	302.06	305.76	318.90	333.54	335.54
38	31	324.01	8.98	309.05	315.70	323.10	334.50	338.75
39	35	326.54	7.41	314.78	316.24	326.60	334.58	335.62
40	35	335.48	13.56	319.69	322.24	332.50	354.88	362.88
41	37	344.23	11.43	328.72	338.88	345.60	354.88	356.64

bias. After delivery, birth weight was recorded and those who were small or large for gestational age (< 10th percentile or > 90th percentile of their gestations, respectively) were excluded to make sure that all fetuses in the study represented the normal population. Mean, standard deviation (SD), 5th, 10th, 50th, 90th, and 95th percentile of each week of gestation were calculated for the values obtained. Statistical calculations were done by using student's T distribution. A p-value of less than 0.05 was statistical significance.

Results

Six Hundred and thirty five eligible cases were used for the present study. At the end of the study, seven cases were excluded due to hydrops fetalis, fetal death, fetal macrosomia, and intrauterine growth restriction. The mean, standard deviation, 5th, 10th, 50th, 90th, and 95thpercentile at each gestational age for BPD, HC, AC, and FL are shown in Table 1, 2, 3, and 4, respectively in all 628 cases. Fetal parameters from the present study are compared to the other studies using means $\pm$ SD for statistical calculations.

For BPD, means $\pm$ SD were statistically significant ($p < 0.05$) higher than Tongsong et al[8] in the northern part of Thailand and in most of the gestations except in 19, 21, 23, 26, 27, 29, and 34 weeks. They were also statistically significant ($p < 0.05$) higher than Charoenvidhya et al[9] in the central part of Thailand and Chitty et al[10] in the Western data at 14, 15, 17, 18, 20, 35, and 36 weeks. There were not statistically different from Koranantakul et al[11] in the southern part of Thailand, except in 26 and 40 weeks.

For HC, means $\pm$ SD were statistically significant ($p < 0.05$) higher than Tongsong et al[12] in the northern part of Thailand, in most of the gestations except in 14, 19, 26, 28, 33, 34, 35, 36 and 38 weeks. They were statistically significant ($p < 0.05$) lower than Chitty et al[10] for Western data except in 14, 16, 19, 21-24 and 27 weeks.

For AC, means $\pm$ SD were not statistically significant different from Tongsong et al[13] in the northern part of Thailand in most of the gestations,

Table 3. Mean, standard deviation and percentile for gestational age of northeastern Thai fetal abdominal circumference

GA (wks)	Sample size (n)	Mean AC (mm)	SD	Percentile				
				5th	10th	50th	90th	95th
14	12	88.67	3.80	84.18	84.46	89.30	91.96	93.85
15	11	101.10	8.48	88.20	94.30	103.60	108.00	108.70
16	11	106.80	10.59	87.75	89.80	108.60	118.50	118.75
17	13	122.87	14.15	102.94	104.30	125.10	137.26	140.22
18	16	130.51	7.12	118.00	119.75	130.90	137.70	145.55
19	20	140.71	13.23	124.24	126.88	140.15	155.20	162.63
20	14	155.14	13.93	142.15	143.74	150.45	175.09	179.99
21	11	165.42	11.38	152.55	156.00	162.20	181.10	183.00
22	12	176.31	8.42	164.64	165.34	172.80	191.24	195.58
23	15	184.65	10.32	170.04	171.72	183.50	201.00	203.07
24	13	193.93	12.80	177.58	180.48	196.50	208.14	212.30
25	15	218.59	18.76	203.77	205.96	215.80	224.78	242.96
26	20	210.96	10.95	194.94	197.88	208.90	224.91	226.98
27	19	227.32	9.72	216.73	219.00	226.10	236.54	241.52
28	23	237.48	14.44	209.53	221.66	239.10	254.76	257.72
29	23	242.67	10.57	220.95	226.50	245.60	251.12	252.91
30	26	259.38	13.08	243.60	245.55	258.75	277.80	282.60
31	29	277.21	16.06	254.68	256.12	272.60	299.78	301.70
32	31	279.07	10.49	258.05	262.30	281.80	289.50	291.35
33	32	284.74	6.94	272.09	278.24	284.05	291.09	295.04
34	31	293.91	9.83	276.95	283.30	295.90	304.50	304.85
35	33	305.71	12.17	290.70	294.50	302.60	329.20	329.68
36	31	311.34	9.55	295.80	296.60	312.50	322.70	324.10
37	29	321.01	20.32	297.24	299.54	317.90	346.94	366.20
38	31	324.17	13.26	308.15	309.90	320.40	342.00	351.10
39	35	333.58	19.38	314.50	315.14	330.20	351.72	359.99
40	35	350.17	19.27	320.20	322.46	348.50	366.08	378.32
41	37	345.31	12.36	324.46	325.52	347.20	356.80	357.00

except in 15, 17, 18, 20, 22, 28 and 32 weeks and from Uerpairojkit et al[14] in the central part of Thailand, except in 25, 26, 31 and 40 weeks, and from the Western data of Chitty et al[15], except in 15, 25, 29 and 34 weeks.

For FL, means $\pm$ SD were statistically significant ($p < 0.05$) longer than Tongsong et al[16] in the northern part of Thailand, in most of the gestations except in 14, 15 and 28 weeks. They were not statistically different from Koranantakul et al[17], in the southern part of Thailand, except in 14, 25 and 32 weeks, and from the Western data of Chitty et al[18], except in 32, 33, 34 and 37 weeks.

The regression equations between fetal parameter and gestational age were formulated using linear regression model as:

1. Equation of mean BPD = $-0.0017GA^3 + 0.0949GA^2 + 1.358GA - 3.7437$, $R^2 = 0.996$
2. Equation of mean HC = $-0.00005GA^3 - 0.1799GA^2 + 18.666GA - 120.73$, $R^2 = 0.997$
3. Equation of mean AC = $-0.0033GA^3 + 0.1937GA^2 + 7.1602GA - 40.448$, $R^2 = 0.998$
4. Equation of mean FL = $-0.0012GA^3 + 0.0616GA^2 + 1.6763GA - 17.585$, $R^2 = 0.965$

Abbreviations: BPD = biparietal diameter (mm), HC = head circumference (mm),AC = abdominal circumference (mm), FL = femur length (mm), GA= gestational age (weeks)

Discussion

Fetal biometry charts in uncomplicated pregnancies have been previously reported. However, the authors needed to establish fetal biometry chart for the authors own antenatal population. When the authors compared fetal bipariatal diameter (BPD) with those from other parts of the country, the authors means of BPD were significant higher statistically than Tongsong et al[8], the northern part of Thailand, but not really different from Koranantakul et al[11], in the southern part of Thailand. Anyway, they were significant higher statistically in the means of BPD especially in the first half of pregnancy than Charoenvidhya et al[9], the central part of Thailand and Western data, Chitty et al[10].

Table 4. Mean, standard deviation and percentile for gestational age of northeastern Thai fetal femur length

GA (wks)	Sample size (n)	Mean FL (mm)	SD	Percentile				
				5th	10th	50th	90th	95th
14	12	13.28	1.02	11.55	12.09	13.50	14.18	14.34
15	11	18.29	2.01	16.45	16.50	18.40	20.00	20.30
16	11	18.87	2.94	13.90	13.90	19.80	22.20	22.45
17	13	24.16	3.43	19.14	20.98	24.70	27.64	27.88
18	16	26.51	2.00	23.73	23.95	26.65	29.20	30.08
19	20	28.35	2.82	24.81	25.28	29.35	30.64	31.01
20	14	32.61	3.40	28.53	28.94	32.05	36.71	38.51
21	11	34.85	2.49	31.05	31.10	34.60	37.60	38.20
22	12	36.61	3.05	32.76	32.90	36.40	39.38	41.12
23	15	40.21	2.80	36.01	36.30	40.80	43.44	44.02
24	13	42.22	1.71	39.22	39.64	42.50	44.16	44.24
25	15	47.00	5.88	42.22	43.52	45.60	49.10	54.52
26	20	46.00	2.65	41.59	41.96	46.15	48.64	49.03
27	19	49.01	2.01	46.70	47.20	48.40	51.46	51.98
28	23	50.11	5.92	46.02	46.38	51.10	54.48	54.95
29	23	53.60	2.02	49.80	51.70	53.80	56.16	56.48
30	26	56.25	2.45	52.03	53.80	56.10	59.05	59.33
31	29	59.44	2.62	55.00	56.76	59.60	62.50	62.86
32	31	58.85	2.26	55.30	55.70	59.10	61.50	61.80
33	32	60.71	2.43	55.81	57.97	64.33	64.33	64.59
34	31	62.16	2.91	57.25	58.90	62.60	64.60	65.55
35	33	65.22	2.07	61.98	63.52	65.20	67.56	68.78
36	31	67.57	1.89	64.35	65.90	67.60	69.10	70.50
37	29	68.36	1.89	65.18	65.86	68.20	70.58	71.02
38	31	69.86	3.43	65.55	66.70	69.90	75.10	75.20
39	35	71.09	3.46	65.41	67.38	71.50	73.66	74.35
40	35	73.50	4.34	69.47	70.60	74.20	75.00	75.93
41	37	73.67	3.04	68.66	70.68	74.00	76.14	76.34

For fetal head circumference (HC), the presented fetal HC growth patterns were significant higher statistically in the 1st and 2nd trimester but not in the 3rd trimester when the authors compared with Tongsong et al[12], the northern part of Thailand. Conversely, when compared with Chitty et al[10], the authors means of HC were significantly lower statistically in the 3rd trimester but not in the 1st and 2nd trimester.

It is surprising that the presented fetal abdominal circumference (AC) growth patterns were not so different statistically when compared with all those from Tongsong et al[13], the northern part of Thailand, Uerpairojkit et al[14], the central part of Thailand and from Western countries, Chitty et al[15].

Lastly, for fetal femur length (FL), the presented data show that the means of FL were statistically significant longer in every trimester than Tongsong et al[16], the northern part of Thailand but not different from Kor-anantakul et al[17], the southern part of Thailand and Chitty et al[18].

The differences of races, region, the resolution and magnification of the ultrasound machine, the year the ultrasound machine used in the research was produced will be the reasons why the presented data is different from the others [5]. Unequal sample size for each parameter had no effect on the presented data because the highest sample size of each parameter at each gestation was used to make sure that the authors got the adequate sample size.

The strengths of the present study were firstly an adequate sample size. Secondly, the authors were able to exclude the fetuses which, after birth, were small or large base on gestational age. Thirdly, the authors used one operator to avoid interobserver variation. Fourthly, the authors used only one ultrasound machine and one abdominal transducer to avoid equipment variation. However, the authors studied in cross sectional rather than longitudinal measurements due to time limitation. The authors think a longitudinal study may be considered necessary if it is possible.

In conclusion, normal fetal biometry charts were established for pregnant, northeastern Thai women

and could be used as the reference in the authors antenatal care clinic.

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References

1. Okupe RF, Coker OO, Gbajumo SA. Assessment of fetal biparietal diameter during normal pregnancy by ultrasound in Nigerian women. Br J Obstet Gynaecol 1984; 91: 629-31.
2. Chudleigh T, Thilaganathan B. Routine second trimester screening-assessing gestational age. In: Chudleigh T, Thilaganathan B, editors. Obstetric ultrasound. 3rd ed. London: Elsevier Churchill Livingstone; 2004: 95-112.
3. Jeanty P, Romero R. Obstetric ultrasound. New York: McGraw-Hill; 1986: 183-7.
4. Siwadune T, Sunsaneevithayakul P, Titapant V, Boriboonhirunsarn D, Kanokpongsakdi S. Charts of Thai fetal bio-metries: 2. Biparietal diameter. J Med Assoc Thai 2000; 83: 292-8.
5. Werawatakul Y, Sakondhavat C, Panamonta O, Panthongviriyakul C. The normal fetal biparietal diameter against week of gestation in normal pregnant women at Srinagarind hospital. Srinagarind Hosp Med J 1991; 5: 247-58.
6. Taksaphan S, Pengsaa K, Lerdsukpresert S, Kuslerdjariya S, Voramongkol N, Harnpinijsak S, et al. Intrauterine growth of northeastern Thai infants. J Pediatr Soc Thai 1990; 29: 42-53.
7. Campbell S, Thomus A. Ultrasound measurement of the fetal head to abdomen circumference ratio in the assessment of growth retardation. Br J Obstet Gynaecol 1977; 84: 165-74.
8. Tongsong T, Wanapirak C, Yampochai A. Ultrasonic measurements of fetal biparietal diameter in normal pregnant Northern Thai women. Thai J Obstet Gynaecol 1990; 2: 73-9.
9. Charoenvidhya D, Sangkhavasi K, Witoonpanish P, Waiquamdee P. Growth of fetal biparietal diameter during normal pregnancy. Chula Med J 1986; 30: 849-56.
10. Chitty LS, Altman DG, Henderson A, Campbell S. Charts of fetal size: 2. Head measurements. Br J Obstet Gynaecol 1994; 101: 35-43.
11. Koranantakul O, Rattanapreuksachart R, Chanvita P. Fetal biparietal diameters in normal pregnant southern Thai women. Thai J Obstet Gynaecol 1991; 3: 71-7.
12. Tongsong T, Wanapirak C. Correlation between gestational age and ultrasonic head circumference. Chula Med J 1991; 35: 265-71.
13. Tongsong T, Wanapirak C, Takapijitra A. Ultrasonographic fetal abdominal circumference in normal pregnant northern Thai women. Thai J Obstet Gynaecol 1990; 2: 81-6.
14. Uerpairojkit B, Manotaya S, Tanawattanachareon S, Tannirundorn Y, Charoenvidhya D. Fetal abdominal circumference (AC) in normal pregnancy: Chulalongkorn population. Chula Med J 1997; 4: 823-32.
15. Chitty LS, Altman DG, Henderson A, Campbell S. Charts of fetal size: 3. Abdominal measurements. Br J Obstet Gynaecol 1994; 101: 125-31.
16. Tongsong T, Wanapirak C, Takapijitra A. Ultrasound fetal femur length in normal pregnant Northern Thai women. Thai J Obstet Gynaecol 1991; 3: 79-83.
17. Kor-anantakul O, Rattanapreuksachart R. Ultrasonic measurement of the fetal femur length in normal pregnant Southern Thai women. Songklanakarine Med J 1993; 11: 1-8.
18. Chitty LS, Altman DG, Henderson A, Campbell S. Charts of fetal size: 4. Femur length. Br J Obstet Gynaecol 1994; 101: 132-5.

ตารางอ้างอิงขนาดทารกในครรภ์สำหรับสตรีไทยที่ตั้งครรภ์ปกติ ในภาคตะวันออกเฉียงเหนือ

ปิยะมาศ ศักดิ์ศิริวุฒโฒ, ถวัลย์วงค์ รัตนสิริ, รัตนา คำวิลัยศักดิ์

วัตถุประสงค์: *เพื่อสร้างตารางอ้างอิงแสดงค่าปกติ ของเส้นผ่านศูนย์กลางศีรษะ เส้นรอบวงศีรษะ เส้นรอบวงท้องและความยาวกระดูกต้นขา ของกลุ่มทารกในครรภ์ปกติ ที่มีอายุครรภ์ตั้งแต่ 14-41 สัปดาห์ ในภาคตะวันออกเฉียงเหนือของประเทศไทย และเปรียบเทียบค่าดังกล่าวกับการศึกษาอื่น ๆ*

ชนิดของการวิจัย: *การวิจัยเชิงพรรณนาแบบตัดขวาง*

สถานที่ที่ทำวิจัย: *สาขาวินิจฉัยและรักษาทารกในครรภ์ ภาควิชาสูติศาสตร์และนรีเวชวิทยา คณะแพทยศาสตร์โรงพยาบาลศรีนครินทร์ มหาวิทยาลัยขอนแก่น*

วัสดุและวิธีการ: *สตรีไทย ตั้งครรภ์เดี่ยวปกติ ที่มีภูมิลำเนาอยู่ในภาคตะวันออกเฉียงเหนือ จำนวน 635 ราย อายุครรภ์ตั้งแต่ 14-41 สัปดาห์ ระหว่างวันที่ 1 ตุลาคม พ.ศ. 2548 ถึง วันที่ 31 ธันวาคม พ.ศ. 2549 นำสตรีตั้งครรภ์ที่มีลักษณะตามเกณฑ์ เข้ารับการตรวจคลื่นเสียงความถี่สูงทางหน้าท้อง เพื่อวัดขนาดของทารกในครรภ์ และเปรียบเทียบค่าดังกล่าวกับการศึกษาอื่น ๆ โดยใช้ student's T distribution*

ตัววัดที่สำคัญ: *ตารางอ้างอิงขนาดทารกในครรภ์สำหรับสตรีไทยที่ตั้งครรภ์ปกติ ในภาคตะวันออกเฉียงเหนือ ที่มีอายุครรภ์ตั้งแต่ 14-41 สัปดาห์*

ผลการศึกษา: *ขนาดทารกในครรภ์ปกติ จำนวน 628 ราย จาก 635 ราย ได้ถูกนำมาสร้างตารางอ้างอิง เมื่อนำมาเปรียบเทียบกับภาคต่าง ๆ และต่างประเทศพบว่า มีขนาดใหญ่ทุกส่วน (ยกเว้นเส้นรอบวงท้อง) อย่างมีนัยสำคัญทางสถิติเมื่อเทียบกับทารกในครรภ์ในภาคเหนือ แต่มีขนาดใกล้เคียงกับทารกในครรภ์ในภาคใต้ (เฉพาะเส้นผ่านศูนย์กลางศีรษะและความยาวกระดูกต้นขา) อย่างไรก็ตาม เมื่อเทียบกับภาคกลางและการศึกษาจากต่างประเทศพบว่า มีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติเพียงบางอายุครรภ์*

สรุป: *ได้ตารางอ้างอิงขนาดทารกในครรภ์ปกติของภาคตะวันออกเฉียงเหนือ เมื่อเปรียบเทียบกับการศึกษาอื่น ๆ ตารางอ้างอิงที่ได้สามารถนำมาใช้ในประชากรของภาคนี้ได้*