
OBSTETRICS

Postpartum Weight Retention in Thai Singleton Pregnant Women with Normal Pre-pregnancy Body Mass Index

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ABSTRACT

Objective: To determine the mean postpartum weight retention in Thai singleton pregnant women with normal pre-pregnancy body mass index (BMI) at sixth week postpartum period.

Study design: Descriptive study

Materials and Methods: Six weeks after delivery, 185 women who visited postpartum clinic and reached the inclusion criteria (Thai pregnancy with normal pre-pregnancy BMI (18.5-24.9 kg./m²), no medical or obstetric complications during pregnancy with term delivery and normal birth weight infant) were included. The questionnaires including age, parity, height, pre-pregnancy weight, gestational weight gain, body weight at postpartum visit, monthly income and the other factors (breastfeeding, nutritional status, physical activity) were recorded and further statistically analyzed.

Results: Mean weight retention at sixth weeks postpartum in Thai singleton pregnancy with normal pre-pregnancy BMI was 4.99 ± 4.03 kg. Nineteenth point four six (36/185) and zero point five four percent (1/185) of these women became overweight and obesity, respectively. Gestational weight gain, breastfeeding behavior and daily dietary composition during postpartum period were the significant factors ($P < 0.05$) which affected the postpartum weight retention.

Conclusion: Mean weight retention at sixth weeks postpartum in Thai singleton pregnancy with normal pre-pregnancy BMI was 4.99 ± 4.03 kg. The recommendation for the optimal gestational weight gain, absolute breastfeeding and the appropriate nutrition after delivery and the suggestion of weight reduction at postpartum visit are the important issues which the obstetricians should be concerned.

Keywords: postpartum weight retention, pre-pregnancy BMI, postpartum BMI

Introduction

Postpartum weight retention is the amount of weight gain during pregnancy that the woman has at a given time point postpartum.⁽¹⁾ In this study, we focus on postpartum weight retention at the end of

sixth weeks postpartum as this is the end point of maternal related care.

During the pregnancy, there are many factors which influence gestational weight gain such as hormonal changes, nutritional status of the mothers,

fetal weight, placenta weight and the amount of amniotic fluid. According to WHO recommendation, normal pre-pregnancy body mass index (BMI) for Asian populations should be 18.5 – 24.9 kg/m².⁽²⁾ The appropriate gestational weight gain for normal pre-pregnancy BMI mothers is 11.5 – 16 kg. according to the Institute of Medicine (IOM 1990) recommendation.⁽³⁾ The maternal weight should be declined their pre-pregnancy weights at sixth weeks postpartum.⁽⁴⁾ Nevertheless, previous studies showed that only 15-28% of pregnant women could resume their pre-pregnancy weight.⁽⁴⁻⁶⁾ The average postpartum weight retention was 3-7 kg. with no difference among races.⁽⁷⁾

The excess postpartum weight retention is the adverse effect causing obesity and metabolic syndrome in the later life. Obesity has been described in recent years as an important public health problem, its important determinant role in the occurrence of cardiovascular diseases, hypertension and diabetes. The reproductive cycle, and especially pregnancy and the subsequent postpartum months, is recognized as a risk period for the development of obesity, manifested principally as postpartum weight retention.⁽⁸⁾

Metabolic syndrome is also associated with diabetes mellitus and cardiovascular disease which are the major causes of death in adult.⁽⁹⁾

Furthermore, there are many factors affecting postpartum weight retention in the previous study of different countries, for example, gestational weight gain, parity, pre-pregnancy BMI, total family income, breastfeeding, diet control, and physical activities.^(8,10-17)

The purpose of this study is to determine the mean postpartum weight retention in Thai singleton pregnancy with normal pre-pregnancy body mass index at sixth week postpartum period.

Materials and Methods

This descriptive study was conducted at the Department of Obstetrics and Gynaecology, Siriraj Hospital with the approval of the Institution's Ethics Committee. One hundred and eighty five women

who consecutively attended postpartum clinic between May 2008 and July 2008 were included. The inclusion criteria were Thai pregnancy with normal pre-pregnancy BMI (18.5-24.9 kg./m²) with singleton term delivery (37-42 weeks gestation) and normal birth weight infant (2,500-4,000 g.). The studying cases were done at sixth week postpartum. Informed consents were obtained. Maternal pre-existing diseases, medical or obstetric complications during pregnancy, fetal anomalies, dead fetus and the subjects who could not remember their pre-pregnancy weight, were excluded.

The record form was completed by the officers at the postpartum clinic. The questionnaires included age, height, pre-pregnancy weight, gestational weight gain, body weight at postpartum visit, parity, monthly family income, breastfeeding behavior, postpartum daily diet and physical activity were recorded and then further statistically analyzed.

Pre-pregnancy weights and gestational weight gain were obtained by recalling of the mothers. Monthly family income used the cut-off of 15,000 baht. Whether absolute breastfeeding or not, more than 50% of favored daily diet (vegetarian, protein, carbohydrate and fat) and at least 1 time a weeks of physical activity (i.e. housework) were the factors of interest in this study.

Statistical analysis

Statistical analysis was performed by SPSS for windows, version 12. The results were reported as mean and standard deviation. The unpaired t-test and 1-way ANOVA, Pearson correlations were used to determine the factors which affected weight retention at 6th weeks postpartum. Statistical significance was considered if p-value < 0.05.

Results

The mean postpartum weight retention in Thai singleton pregnant women with normal pre-pregnancy BMI is 4.99 ± 4.03 kg. The numeric factors (age, height, pre-pregnancy weight, pre-pregnancy BMI, gestational weight gain and birth weight) are summarized in Table 1. Gestational

weight gain during pregnancy has a consistent positive relationship to postpartum weight retention ($P<0.05$), whereas maternal age, maternal height, pre-pregnancy weight, pre-pregnancy BMI and birth weight were unrelated to postpartum weight retention.

Table 2 showed the factors contributing to postpartum weight retention. Absolute breastfeeding and daily diet were the significant factors which

associated with postpartum weight retention ($P<0.05$). The vegetarian mothers had the lowest mean postpartum weight retention whereas the mothers who favored consuming fat caused highest weight retention.

Interestingly, the postpartum BMI at six weeks postpartum showed that 19.5% (36/185) and 0.5% (1/185) of the mothers became overweight and obesity, respectively as shown in Table 3.

Table 1. Characteristics of the study population (n = 185 cases)

	Mean	Min.	Max.	SD.	r	P-value
Postpartum weight retention (kg.)	4.99	-5.3	22	4.03	1	
Age (year)	27	16	41	5.42	0.04	0.63
Height (m.)	1.58	1.45	1.76	0.06	0.09	0.24
Pre-pregnancy weight (kg.)	52.93	40	75	6.38	0.003	0.97
Pre-pregnancy BMI (kg./m ²)	21.10	18.55	24.89	1.62	-0.07	0.37
Gestational weight gain (kg.)*	14.68	4	31	4.93	0.72	<0.01
Birth weight (g.)	3,090	2,500	4,000	364.43	0.14	0.07

* $P<0.05$ significant

Table 2. Factors contributing postpartum weight retention

		N (case)	Mean (kg.)	SD	P-value
Breast feeding*	Absolute breastfeeding	133	4.62	3.76	0.045
	Non-absolute breastfeeding	52	5.93	4.56	
Parity	Primiparous	139	5.19	4.06	0.234
	Multiparous	46	4.37	3.93	
Monthly family income (Baht)	≤ 15,000	147	4.74	3.57	0.208
	> 15,000	38	5.93	5.42	
Physical activity	≥ 1time/week	96	5.06	3.98	0.806
	< 1time/week	89	4.91	4.12	
Daily diet*	Vegetarian	64	3.12	2.82	<0.001
	Protein	76	5.23	3.89	
	Carbohydrate	38	7.16	4.59	
	Fat	7	7.63	4.58	

* $P<0.05$ significant

Table 3. Postpartum BMI of the studying group (N = 185)

Postpartum BMI	N	Percent
Underweight (BMI < 18.5 kg./m ²)	2	1.1
Normal (BMI 18.5-24.9 kg./m ²)	146	78.9
Overweight (BMI ≥ 25-29.9 kg./m ²)	36	19.5
Obesity (BMI ≥ 30kg./m ²)	1	0.5

Discussion

Postpartum weight retention is the amount of weight gain during pregnancy that the woman has at a given time point postpartum.⁽¹⁾ Excess retention of postpartum weight is one of the risk factors resulting medical diseases in the future especially obesity and metabolic syndrome, which consequently cause the adverse health problems such as diabetes mellitus and cardiovascular disease.^(8,9)

Mean postpartum weight retention from the previous studies had been varied country to country. The Chinese mothers whose average pre-pregnancy BMI of 20.4 kg./m². had the postpartum weight retention of 6.77 kg.,⁽¹⁸⁾ while those from the other study varied from 3-7 kg.⁽⁷⁾ Our study found that mean postpartum weight retention in Thai singleton pregnancy with normal pre-pregnancy BMI was 4.99 kg. which was in the same range as in the other studies

There are many different factors affecting on the postpartum weight retention. In 1998, Thorsdottir I, et al reported that gestational weight gain during pregnancy significantly affected weight retention at 18-24 months postpartum.⁽¹¹⁾ Behavior and duration of breastfeeding also affected postpartum weight retention.^(14,15) Furthermore, the other associated factors such as parity, pre-pregnancy BMI, socioeconomic status, diet control, increased physical activity were also reported.^(8,12,13,16,17)

Our study revealed three factors that significantly related to postpartum weight retention; gestational weight gain during current pregnancy, breast feeding behavior and daily dietary composition (P<0.05). More gestational weight gain caused more

postpartum weight retention. Absolute breastfeeding and vegetarian mothers had lesser postpartum weight retention than the others. It is the good clinical practice that obstetricians should recommend or advise appropriate gestational weight gain, absolute breastfeeding and appropriate diet to all pregnant women.

The previous studies showed that parity, pre-pregnancy weight/BMI, socioeconomic status and physical activity were associated with postpartum weight retention.^(8,12,13,16,17) The enrolled groups in our study were normal pre-pregnancy BMI. We found no association between postpartum weight retention and parity and monthly family income because most of our participants were primiparous (139/185) and had low income (147/185).

Concerning postpartum BMI in our study, we found that 19.5% (36/185) and 0.5% (1/185) of our subjects became overweight and obesity, respectively. Appropriate nutritional recommendation during postpartum period and even during pregnancy should be realized by the obstetricians for the maternal and fetal welfare. The underweight group was 1% (2/185) and was also the problem, for example, during breastfeeding.

There were some limitations in our study. Firstly, maternal pre-pregnancy weights and gestational weight gain came from self-recalling which may cause some error of the date. However, this is the best way to get information from all subjects who did not have any previous hospital records. Secondly, there was no standard questionnaire for this type of study therefore some data might be incomplete. Thirdly, exercise and dairy

diet were roughly evaluated. Furthermore these were still many other contributing factors that should be collected for analysis such as self baby care, weight reduction course.

However we hope that our data of the postpartum weight retention will lead to the future guideline of obstetricians to control the postpartum weight.

In conclusion, mean weight retention at sixth weeks postpartum in Thai singleton pregnancy with normal pre-pregnancy BMI was 4.99 ± 4.03 kg. The recommendation for the optimal gestational weight gain, absolute breastfeeding and the appropriate nutrition after delivery and the suggestion of weight reduction at postpartum visit is the important issues which the obstetricians should concern.

References

1. Institute of Medicine. Influence of pregnancy weight on maternal and child health. Workshop report. Washington DC: National Academy Press, 2007.
2. WHO expert consultation. Appropriate body mass index for Asian populations and its implications policy and intervention strategies. Lancet 2004;363:157-63.
3. Institute of Medicine. Committee on nutritional status during pregnancy and lactation, Food and Nutrition Board: Nutrition during pregnancy. Part 1, weight gain; Part II, nutrient supplements. Washington DC: National Academy Press, 1990.
4. Olsen LC., Mundt MH. Postpartum weight loss in a nurse-midwifery practice. J Nurse Midwifery 1986; 31:177-81.
5. Schauburger CW, Rooney BL, Brimer LM. Factors that influence weight loss in the puerperium. Obstet Gynecol 1992;79:424-9.
6. Walker LO, Timmerman GM, Sterling BS, Kim M, Dickson P. Do low income women attain their prepregnant weight by the 6th week of postpartum? Ethn Dis 2004;14:119-26.
7. Walker LO, Sterling BS, Timmerman GM. Retention of pregnancy-related weight in the early postpartum period: implications for women's health services. J Obstet Gynecol Neonatal Nurs 2005;34:418-27.
8. Kac G, Benício MH, Velásquez-Meléndez G, Valente JG. Nine months postpartum weight retention predictors for Brazilian women. Public Health Nutr 2004;7:621-8.
9. Bentley-Lewis R, Koruda K, Seely EW. The metabolic syndrome in women. Nat Clin Pract Endocrinol Metab 2007;3:696-704.
10. Keppel KG, Taffel SM. Pregnancy-related weight gain and retention: implications of the 1990 Institute of Medicine guidelines. Am J Public Health 1993;83: 1100-3.
11. Thorsdottir I, Birgisdottir BE. Different weight gain in women of normal weight before pregnancy: postpartum weight and birth weight. Obstet Gynecol 1998;92:377-83.
12. Coitinho DC, Sichieri R, Benicio MHDA. Obesity and weight change related to parity and breast-feeding among parous women in Brazil. Public health Nutr 2001;4:865-70.
13. Nohr EA, Vaeth M, Baker JL, Sorensen Tia, Olsen J, Rasmussen KM. Combined associations of prepregnancy body mass index and gestational weight gain with the outcome of pregnancy. Am J Clin Nutr 2008;87:1750-9.
14. Janney CA, Zhang D, Sowers M. Lactation and weight retention. Am J Clin Nutr 1997;66:1116-24.
15. Kac G, Benício MHDA, Velásquez-Meléndez G, Valente JG, Struchiner CJ. Breastfeeding and postpartum weight retention in a cohort of Brazilian women. Am J Clin Nutr 2004;79:487-93
16. Leermakers EA, Anglin K, Wing RR. Reducing postpartum weight retention through a correspondence intervention. Int J Obes Relat Metab Disord 1998;22:1103-9.
17. O'Toole ML, Sawicki MA, Artal R. Structured diet and physical activity prevent postpartum weight retention. J Women Health 2003;12:991-8.
18. To WW, Cheung W. The relationship between weight gain in pregnancy, birth-weight and postpartum weight retention. Aust NZ J Obstet Gynaecol 1998;38:2: 176-9.

น้ำหนักคงค้างหลังคลอดในหญิงตั้งครรภ์เดี่ยวชาวไทยที่มีดัชนีมวลกายปกติก่อนการตั้งครรภ์

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วัตถุประสงค์ : เพื่อหาค่าเฉลี่ยน้ำหนักคงค้างหลังคลอดของมารดาที่ระยะ 6 สัปดาห์หลังคลอดในหญิงตั้งครรภ์เดี่ยวปกติชาวไทยที่มีดัชนีมวลกายก่อนการตั้งครรภ์ปกติ

วิธีการศึกษา : การวิจัยเชิงพรรณนา

วัสดุและวิธีการ: ภายหลังจากคลอดบุตร 6 สัปดาห์ มารดา 185 คนที่มารับบริการที่คลินิกหลังคลอดและมีคุณสมบัติเข้าได้กับเกณฑ์การคัดเลือกประชากร (หญิงตั้งครรภ์เดี่ยวปกติเชื้อชาติไทยที่มีดัชนีมวลกายก่อนการตั้งครรภ์ปกติ เท่ากับ 18.5-24.9 กิโลกรัมต่อตารางเมตร, มีผลการตั้งครรภ์ปกติ คือ คลอดบุตรในช่วงอายุครรภ์ตั้งแต่ 37-42 สัปดาห์ คลอดบุตรปกติ น้ำหนักตัวระหว่าง 2,500-4,000 กรัม และไม่มีภาวะแทรกซ้อนทั้งทางอายุครรภ์และสูติกรรมขณะตั้งครรภ์, มารับการตรวจหลังคลอด, สมัครใจเข้าร่วมงานวิจัยและลงลายมือชื่อในหนังสือยินยอมเข้าร่วมงานโครงการวิจัย) จะทำการตอบแบบสอบถามที่ประกอบด้วย อายุ, จำนวนการตั้งครรภ์, ส่วนสูง, น้ำหนักตัวก่อนการตั้งครรภ์, น้ำหนักตัวที่เพิ่มขึ้นขณะตั้งครรภ์, น้ำหนักตัวเมื่อมารับบริการที่คลินิกหลังคลอด, รายได้ต่อเดือนและปัจจัยที่เกี่ยวข้อง ได้แก่ พฤติกรรมการให้นมบุตร, การรับประทานอาหารในแต่ละวันและกิจกรรมทางกาย ข้อมูลจะได้รับการบันทึกและวิเคราะห์ทางสถิติต่อไป

ผลการศึกษา : ค่าเฉลี่ยน้ำหนักคงค้างหลังคลอดที่ 6 สัปดาห์ของหญิงตั้งครรภ์เดี่ยวชาวไทยที่มีดัชนีมวลกายปกติก่อนการตั้งครรภ์เท่ากับ 4.99 ± 4.03 กิโลกรัม ร้อยละ 19.46 (36/185) และร้อยละ 0.54 (1/185) ของประชากรที่เข้ารับการศึกษาค้นพบว่ากลายเป็นหญิงที่มีน้ำหนักเกินและอ้วน ตามลำดับ การเพิ่มขึ้นของน้ำหนักตัวขณะตั้งครรภ์, การเลี้ยงลูกด้วยนมแม่และสัดส่วนอาหารที่รับประทานในแต่ละวันเป็นปัจจัยที่มีผลต่อน้ำหนักคงค้างหลังคลอด

สรุป : ค่าเฉลี่ยน้ำหนักคงค้างหลังคลอดที่ 6 สัปดาห์ของหญิงตั้งครรภ์เดี่ยวที่มีดัชนีมวลกายปกติก่อนการตั้งครรภ์ที่คลอดบุตรที่โรงพยาบาลศิริราช เท่ากับ 4.99 ± 4.03 กิโลกรัม คำแนะนำเพื่อให้หญิงตั้งครรภ์มีการเพิ่มขึ้นของน้ำหนักตัวขณะตั้งครรภ์ที่เหมาะสม การเลี้ยงลูกด้วยนมแม่เพียงอย่างเดียวและโภชนาการที่เหมาะสม รวมทั้งการลดน้ำหนักตัวให้อยู่ในเกณฑ์ที่เหมาะสมเมื่อมารดาตรวจหลังคลอดเป็นประเด็นที่สูติแพทย์ควรให้ความสำคัญเป็นอย่างยิ่ง
