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Postpartum Weight Retention in Congolese Pregnant in Kinshasa

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ABSTRACT

Objectives: This study's objectives were to determine proportion of Congolese women with post-partum weight retention and its average level; to identify its risk factors; to determine the proportion of obese women 6 weeks after delivery.

Materials and Methods: A prospective study was conducted from 1st October 2012 to 30th June 2013. We followed up a cohort of 199 women, with a singleton pregnancy, recruited during antenatal care (which began at least at 20 weeks of gestation) in 2 maternity hospitals of Kinshasa. These women were also examined in the labor room and 6weeks after delivery. Our variables of interest were pre-gestational BMI, gestational weight gain and postpartum lifestyle. All data was analyzed using the SPSS 18.0 software.

Results: The mean post-partum weight retention was 3.14 kg with a median of 3kg and extremes ranging from -5 to 17 kg; 75.4% of women were affected by this weight retention. High economic status (p = 0.04) and GWG (p = 0.000) are the main factors associated with weight retention 6 weeks after childbirth. The proportion of obese women increased by 8%.

Conclusion: Our study found that majority of women had weight retention 6 weeks after delivery. They retained an average of 3.14 kg. Care providers should monitor the nutritional status (BMI) of postpartum women through lifestyle counseling.

Key Words: Gestational weight gain, Post-partum weight retention, Obesity

INTRODUCTION

Pregnancy is a period characterized by significant changes in the maternal organism (1). In addition to the effects produced by hormones of placental origin, there is a tissue neoformation mainly on the uterus, breasts and the extracellular fluid (1, 2). These modifications, associated with development of fetus, result in a gestational weight gain (GWG). After delivery the physiological return to non-pregnant state, of organs that have undergone changes during pregnancy, usually occurs around the 6th week of postpartum (3, 4). However, many women retain their GWG several months after childbirth (5-7). The difference between that weight retained and pre-gestational weight defines postpartum weight-retention (PPWR) (8, 9). This PPWR exposes affected women to an increased risk of obesity (6), chronic cardiovascular diseases (10) as well as certain very frequent pathologies during pregnancy, such as pre-eclampsia and gestational diabetes (5-7).

Obesity is spreading at an alarming rate, not only in industrialized countries, but also in developing countries (11). World Health Organization (WHO) estimates that one in 10 (1/10) people are obese worldwide and, according to its predictions, more than half of the adult population in the world will become obese or overweight by 2030 (11). At that time, 80% of obese people will live in developing countries (12).

Democratic Republic of Congo (DRC) is not spared of this world "pandemic". According to the survey of risk factors for non-communicable diseases in Kinshasa (DRC), the prevalence of obesity was 5.7% (2.6% for men and 7.7% for women) (13).

Women are the most affected by obesity worldwide (14) and a lot of studies (5-7) have highlighted pregnancy as a trigger for obesity.

So, to prevent obesity in women involves not only identification of people at risk and risk periods, but also detection and

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suppression of risk factors including PPWR.

This study's objectives will be to determine the frequency and the average of weight retention 6 weeks after delivery; to identify risk factors and behaviors associated with PPWR and determine the proportion of obese women 6 weeks after delivery in the study population.

MATERIAL AND METHODS

A cohort of 199 pregnant women with a single pregnancy, who started their prenatal care at least the 20th week of gestation, were followed from 1st October 2012 to 30th June 2013 in 2 maternities of Kinshasa (University Hospital of Kinshasa and Saint Joseph Hospital). These pregnant women were recruited during prenatal care, re-examined at the labor room and also at the 6th week post partum's appointment.

Pre-gestational weight was the one taken before the 20th week of pregnancy in accordance with a previous study which demonstrated the absence of significant weight change until the 20th week (26).

Maternal information collected were age, economic status, marital status, education level, pre-gestational weight, height, pre-gestational body mass index (BMI), gestational weight gain (GWG), parity, weight at term (at the end of pregnancy), mode of delivery. Maternal weight and type of breastfeeding was collected at the postpartum week six. The newborn information collected was birth weight.

The economic status was defined according to the ownership index of some household properties from which the mother was raised (tap water, electricity, personal toilet, radio set, television set, refrigerator and vehicle). This index distinguishes 4 categories, namely:

- *High level*: tap water, electricity, internal toilet, and each of four consumption materials (radio, television, refrigerator and vehicle);
- *Moderately high level* : any source of drinking other than surface water; internal toilet or not; electricity or not; at least two consumption materials;
- *Moderate level* : any combination of water source, toilet, electricity, consumption materials which is bigger than those defined by low level but smaller than those defined moderately high level;
- *Low level* : surface water is used neither as drinking and undrinkable water, no toilet, no electricity, nor any consumption materials.

Parity was the number of pregnancies which was at least 28 weeks irrespective of the outcome. According to the number of these pregnancies, the primiparas was the one that had one pregnancy while the multiparous had at least two.

Signed consent was also obtained from each participant and the information published anonymously.

STATISTICAL METHODS

The data was analyzed using SPSS 18.0 software. Proportions and confidence intervals was calculated for all categorical variables and the mean with standard deviation, as well as the median and extremes for quantitative variables.

Comparison of proportions was calculated using Pearson's chi-square test and comparison of mean was calculated using *Student* t-test and analysis of variance (One-way ANOVA); α =0.05 level, with a 95 % confidence interval.

RESULTS

1. Maternal and neonatal anthropometric parameters

GWG varied between -4 and 27 kg with a mean of 8.8 ± 3.9 kg; majority of pregnant women (58.8%) had a lower GWG than the IOM recommendations (Table I).

2. Frequency and average of weight retention at the 6th week postpartum

The proportion of women who retained weight 6 weeks after delivery was 75% (Fig. 1) with an average of 14 ± 3.597 kg and a median of 3kg (extremes from -5 to 17 kg) (Table I).

3. Factors and behaviors associated with weight retention at the 6th week postpartum

3.1. Sociodemographic characteristics

Only the economic status is significantly associated with weight retention 6 weeks after childbirth. Women with high economic status have a greater weight retention than those with lower status with a statistically significant difference between the high economic level and the middle one (α= 0.000) (Table II).

3.2. Obstetric Parameters

Six weeks after delivery, multiparous women had a higher weight retention than primiparas; Similarly, women who gave birth by caesarean section retained more weight than women who gave birth by vaginal mode; but the difference between these groups was not statistically significant (P value 0.67 for parity and 0.83 for delivery mode) (Table III).

3.3. Anthropometric parameters

We noted a statistically significant association (p = 0.000) between PPWR 6 weeks after delivery and GWG (Table IV).

3.4. Postpartum behaviors (lifestyle)

None of these factors were significantly associated with weight retention 6 weeks after delivery (Table V).

4. Evolution in BMI categories from pre-gestational period to the 6th week postpartum

The proportion of obese women (BMI ≥ 30 kg / m ^{2}) increased by 8%; from 21 (10, 6%) before pregnancy to 37 (18.6%) 6weeks after childbirth with a statistically significant difference (p = 0.03) (Table VI).

DISCUSSION

In this study, 75% of women had weight retention 6 weeks after delivery. This observation is close to those reported by Schauberger et al. (78%) (17) and Olsen et al. (72%) (18) in USA.

Six weeks seems to be a short period to allow the restoration of pre-gestational weight after childbirth not only in the Congolese women but also in USA (1, 18) and in Asia (19). This high frequency of PPWR at the 6th week postpartum can be explained by the weight loss model in the early postpartum period (20) which suggests that a woman with normal pre-gestational weight and optimal GWG (13.75 kg) can maintain about 4.75 kg during the first 2 weeks of postpartum after expulsion of the fetus (5 kg), loss of the first fluid and regression of non-fat tissue volume such as uterus (4kg) (17, 21, 22). The remaining weight is largely fat deposition (23). According to Lawrence et al. (21) loss of fat deposits in the first weeks of postpartum occurs at a rate of 0.25 kg per week. Therefore, it will take about 19 weeks to lose the 4.75 kg retained after delivery.

The mean of weight retention at the 6th week postpartum in our study population was 3.14 kg. In a meta-analysis conducted in Western countries (Europe and America) from 1986 to 2004, the mean of weight retention in the 6th postpartum week varied between 3-7 kg (24). A similar study conducted in Asia from 1990 to 2010 reported a mean of PPWR at the 6th week between 2.5 and 8.6 Kg (25). PPWR at week 6 among Congolese women is in the same range with those countries, in which obesity is currently a public health problem (23, 24% of women are obese in Western countries and 29% in Asia) (14). Congolese care providers should take preventive measures against PPWR and, in that way, be able to control in part the emerging problem of obesity (26).

In our study, gestational weight gain and economic status were significantly associated with the PPWR. Regarding GWG, it is the most important predictor of postpartum weight retention in the literature (24, 25).

The economic status is significantly associated to PPWR at the 6th week of post-partum (p <0.04). Existence of a disparity in the returning back to pre-gestational weight by economic status was also found among American women (20, 27) where low-income black women tended to have a high PPWR and developed obesity later. Unlike American studies, in our study, it is women with a higher economic status who were more likely to retain more weight. This difference could be explained by many factors (13) related to industrialization and modernization of cities in developing country-which lead to a change in lifestyle of high economic classes (unbalanced diet, stress, decreased physical activity) and favors the occurrence of obesity.

CONCLUSION

Postpartum weight retention is a new dimension in understanding the global "pandemic" of obesity. This study showed that, in Kinshasa, majority of women had weight retention at the end of the postpartum period (6th week). The main factors influencing that retention was GWG and high socio-economic level. The proportion of obese women increases in the postpartum week 6.

Perinatal care givers must place special emphasis on weight control for women both during pregnancy (to control GWG) and after childbirth. They should provide women with useful information on post-delivery behavior to avoid significant postpartum weight retention that can lead to obesity.

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Conflict of interest

The authors declare no conflict of interest.

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1. MATERNAL AND NEONATAL ANTHROPOMETRIC PARAMETERS

Table I. Maternal and neonatal anthropometric parameters

	n	%	Means ± SD	Max - Min
Pre-gestational weight (Kg)	199		64.6 ± 13.3	42-109
Weight at term (Kg)	199		73.4 ± 14.1	48-125
Height (m)	199		1.62 ± 0.06	1.47 to 1.81
Pre-gestat. BMI. (Kg / m ²)				15-40
<18.5 (thin)	11	5.5		
18.5-24.9 (normal)	111	55.8	24.3 ± 4.6	
25- 29.9 (overweight)	56	28.1		
≥ 30 (obese)	21	10.6		
GWG/IOM (Kg)	199			4 – 27
Insufficient	117	58.8		
Optimal	52	26.1	8.8 ± 3.9	

Excessive	30	15.1		
PPWR at 6 weeks	199		3.14 ± 3.597	-5- 17
New born birth weight (g)				
<2500 (SGA)	8	4		
2500 - 3999 (normal)	181	91	3219.4 ± 443.8	2000-4800
≥ 4000 (Macrosomia)	10	5		

IOM: Institute of Medicine, SGA: Small for gestational age

3. FACTORS ASSOCIATED WITH WEIGHT RETENTION AT THE 6TH WEEK POSTPARTUM

3.1. Sociodemographic characteristics

Table II. PPWR and socio-demographic characteristics

	n (case)	Median	Min.	Max.	p
Age (years old)					0.47
<20	8	1	-2	4	
20 – 29	92	3	-4	17	
30 – 39	90	2.35	-5	11	
≥ 40	9	3	-3	9	
Marital status					0.48
Married	167	3	-5	17	
Single	32	2	-4	15	
Economic status					0.04
High *	32	4.30	-2	11	
Moderately high	124	3	-5	17	
Middle *	42	2	-4	11	
low	1.00	.			

* Statistically significant difference between the high socio-economic level and the average level (0.000).

3.2. Obstetric Parameters

Table III. PPWR and obstetric parameters

	n	Mean ±SD	Median	p
Parity				0.67
Primiparous	75	2.76 ± 3.837	2	
multiparous	124	3.37 ± 3.438	3	
Delivery				0.83
Vaginal	142	3.11 ± 3.409	2.85	
caesarean	57	3.22 ± 4.058	3	

3.3. Anthropometric parameters

Table IV. Mean of PPWR and anthropometric parameters

	n	Mean ± SD	Median	p
pre gesta. BMI (Kg / m ²)				0.141
<18.5	11	2.15 ± 3.751	2	
18.5 - 24.9	111	3.34 ± 3.581	3	
25 - 29.9	56	2.94 ± 3.529	2.80	
≥ 30	21	3.16 ± 3.920	3	
GWG *				0,000
Insufficient	117	2.15 ± 2.032		
Optimal	52	4.15 ± 3.923		
Excessive GWG	30	5.26 ± 5.011		

* Statistically significant difference between GWG and PPWR at week 6 (0.000).

3.4. Postpartum lifestyle

Table V. Mean PPWR and postpartum lifestyle

	n	Mean± SD	Median	p
Exclusive Breastfeeding				0,260
Yes	113	2.89 ± 3.222	2.60	
No	86	3.47 ± 4.032	3	
Physical activity				0.682
No	91	3.03 ± 3.590		
Yes	108	3.24 ± 3.616		

4. EVOLUTION IN BMI CATEGORIES FROM PRE-GESTATIONAL PERIOD TO THE 6TH WEEK POSTPARTUM

Table VI. Evolution in BMI categories from pre-pregnancy period to the 6th week postpartum

BMI (Kg / m²)	Pre-gestational n (%)	6th week post-partum n (%)	p
<18.5	11 (5.5)	6 (3.0)	0.3
18.5-24.9	111 (55.8)	99 (49.7)	0.2
25- 29.9	56 (28.1)	57 (28.6)	0.9
≥ 30	21 (10.6)	37 (18.6)	0.03
TOTAL	199 (100)	199 (100)	

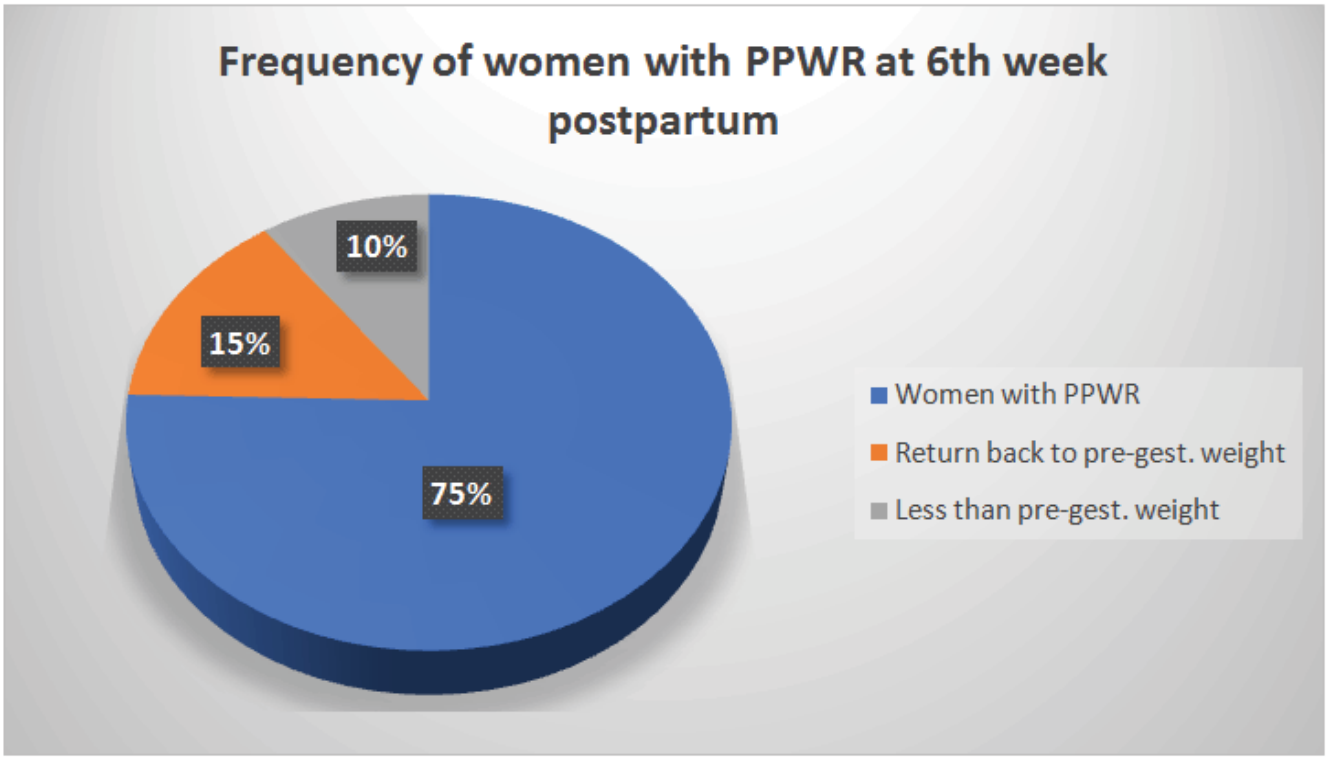

Figure 1: Frequency of women with PPWR at the 6th week