

Assessment of Birth Weight and Its Related Factors among Infants Born in the Hospitals of Ahwaz Jondishapour University

Shiva Faghih¹,
Ehsan Hejazi²

¹Department of Community Nutrition, School of Nutrition and Food Sciences, Shiraz University of Medical Sciences, Shiraz, Iran;

²Department of Clinical Nutrition, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Correspondence:

Shiva Faghih, Ph.D.,

Department of Community Nutrition, School of Nutrition and Food Sciences, Shiraz University of Medical Sciences, Shiraz, Iran

Tel: +98-711-7251001

Fax: +98-711-7251001

Email: sh_faghih@sums.ac.ir

Received: 25 August 2013

Revised: 27 October 2013

Accepted: 8 November 2013

Abstract

Background: Given the importance of birth weight and the effects of anthropometric indices and socioeconomic status on it, this study was conducted to assess birth weight and its related factors among infants born in the hospitals of Ahwaz Jondishapour University.

Methods: This cross-sectional study was carried out on 269 newly born babies and their mothers in hospitals of Ahwaz Jondishapour University during 2009. Neonate anthropometric measures were obtained from hospital reports. The mothers were asked about their weight before pregnancy, their weight gain and demographic and socioeconomic data. SPSS software version 16 was used to analyze the data. Relationships among infants and mothers' anthropometric indices were assessed using bivariate correlation.

Results: 86.8% of the infants were normal as to weight, 8.7% were underweight, and 4.5% overweight. Mothers' weight gain during pregnancy and BMI before pregnancy were 12.18 ± 5.18 (kg) and 24.75 ± 4.78 (kg/m²), respectively. There was a significant correlation between infant's birth weight and mother's weight, height and weight gain during pregnancy.

Discussion: Results of this study showed that mothers' weight before pregnancy and their pregnancy weight gain have a key role in infant birth weight, so controlling the mother's weight gain according to recommendation has a great effect on infant's health.

Please cite this article as: Faghih Sh, Hejazi E. Assessment of Birth Weight and Its Related Factors among Infants Born in the Hospitals of Ahwaz Jondishapour University. *J Health Sci Surveillance Sys*. 2014;2(1):26-29.

Keywords: Birth Weight; Pregnancy; Weight Gain

Introduction

Birth weight is one of the important determinants of health.¹ Low birth weight (LBW) is related to neonatal mortality.^{2,3} In fact, LBW endangers health for the whole life and causes growth and development retardation, and even medical impairments during adulthood.^{2,4} Moreover, compared to normal weight infants, the risk of metabolic syndrome in adulthood is more among LBW infants.⁴

On the other hand, giving birth to overweight infant is related to obstetric complications and birth weight is an index for predicting the risk of obesity, diabetes and

cardiovascular diseases in adulthood.¹ Many factors can affect birth weight including the mother's weight, height,⁵ BMI before pregnancy,^{6,7} mother's weight gain during gestation,^{5,7} mother's nutritional status, socioeconomic status, and genetics.^{8,9}

Some studies indicate that among the mentioned factors mother's weight gain during pregnancy and her BMI before pregnancy are the best predictors of infant birth weight.^{10,11}

Regarding the mentioned issues, we decided to assess the prevalence of low birth weight and its related factors among infants born in the hospitals of Ahwaz Jondishapour University.

Materials and Methods

This cross-sectional study was carried out on 269 neonates and their mothers in the hospitals of Ahwaz Jondishapour University during autumn 2009. Data were collected on mother's weight, height and BMI before pregnancy, neonate's weight and height, mother's weight gain during pregnancy, and demographic and socioeconomic status. Neonates' anthropometric measures were obtained from hospital reports. Mother's height was measured bare foot using a Seca stadiometer to the nearest 0.1 Cm. Mothers' weight before pregnancy, mothers' weight gain and demographic and socioeconomic questions were recorded. SPSS version 16 was used to analyze the data. Normality of variables was assessed using Kolmogorov-Smirnov test. Association between mothers'

anthropometric indices, mothers' weight gain and infants' anthropometric measures was obtained using bivariate correlation.

Results

We assessed 269 infants consisting of 118(43.9%) girls and 115(56.1%) boys. Mean±SD of birth weight, infant height and head circumference were 3167.85±530.47(gr), 51.05±3.89(Cm) and 34.75±2.08(Cm), respectively. 8.6% of the infants were LBW(Table 1).

Mean and standard deviation of mothers' age were 26.26±5.80(year), height 161.09±6.72(Cm), pregnancy weight gain 12.18±5.18(Kg) and BMI before pregnancy 24.75±4.78(Kg/m²). Mothers' socioeconomic status and anthropometric indices are presented in Table 2.

Table 1: Frequency of anthropometric indices and gender of the infants

Infant characteristics	Frequency		mean±SD	Range
	Number	Percent		
<u>Gender</u>				
Girl	118	43.9		
boy	151	56.1		
<u>Weight(gr)</u>			3167.85±530.47	1400-6100
2500	23	8.6		
2500-3999	231	86.8		
4000 <	12	4.5		
<u>Height(Cm)</u>			51.05±3.89	39-74
Head circumference(Cm)			34.75±2.08	29-55

Table 2: Socioeconomic status and anthropometric indices of the mothers

Mother's characteristics	Frequency		mean±SD	Range
	Number	Percent		
<u>Age(year)</u>			26.26±5.80	15-43
≤18	15	5.6		
19-35	241	89.6		
≥36	13	4.8		
<u>BMI(kg/m²)</u>			24.75±4.78	16.20-42.97
18.5	37	14.1		
18.5-24.9	132	49.0		
≥25	88	36.9		
<u>Pregnancy weight gain(kg)</u>			12.18±5.18	2-25
Less than recommended	94	34.8		
Equal recommended	84	31.6		
More than recommended	89	33.7		
<u>Height(Cm)</u>			161.09±6.72	130-180
155	40	15.8		
≥155	226	84.2		
<u>Weight(kg)</u>			64.56±11.49	42-110
<u>Education</u>				
Illiterate	44	16.4		
Primary	103	38.3		
Diploma	103	38.3		
Academic	19	7.1		
<u>Parity</u>			2.09±1.35	1-9
1	117	44.7		
2	109	41.6		
≥3	36	13.7		
<u>Duration since previous pregnancy(year)</u>			4.86±3.52	1-20
2	70	26.5		
3-4	89	32.7		
≥5	110	40.8		

The results of Pearson correlation test showed that there were significant correlations between infants' birth weight and mothers' weight, height, and pregnancy weight gain. Also, there were significant correlations between infants' height and head circumference and mothers' height (Table 3). No significant correlations were found among infants' anthropometric indices and mothers' education, parity or pregnancy intervals (Table 4).

Discussion

Results of our study indicated that 86.8% of the neonates were normal in weight, 8.7% were underweight and 4.5% overweight. Gashtasbi et al in a study in 2009 reported that 2.2% of infants born in Mahdieh and Lolagar hospitals in Tehran were LBW and 4.7% were overweight.⁹ Also Fallah et al reported 9.35% LBW among the newborn infants in Yazd in 2007.¹²

In the present study there was a correlation between infant's birth weight and mother's weight, height and weight gain during pregnancy. Also we found a significant correlation between the infant's height and head circumference and mother's height. In agreement with our findings, Delaram et al.¹³ also Zohur et al.¹⁴ found that infant's birth weight was correlated to mother's weight before pregnancy. It seems that taller mothers with larger size had bigger placenta so they gave birth to heavier infants. Besides, giving birth to LBW infants is more probable in underweight mothers due to their small placenta.¹⁵

Tabandeh et al.¹⁶ and Carneran et al.¹⁷ reported that mother's weight gain was significantly correlated to infant's birth weight; this is in agreement with our results. Some of the studies indicated that among the infant's birth weight factors, mother's weight gain was more important than other factors.¹⁰ Mother's weight gain during pregnancy is closely correlated to the intake of energy and nutrients, which in turn result in more appropriate intrauterine growth.⁹

In spite of the results of several studies which showed infant's birth weight was correlated to mother's education and socioeconomic status, we did not find such a correlation which could be explained by the participants' homogeneity with regard to education and socioeconomic status.

The main limitation of our study was relying on the memory of participants for values of mother's weight gain and their weight before pregnancy; it was inevitable as it was a cross-sectional study. In order to obtain more accurate results, cohort studies are recommended.

In conclusion, the results of our study indicate that mother's weight before pregnancy and pregnancy weight gain have a key role in infant's birth weight. So, according to recommendations of the institute of medicine, controlling the mother's weight gain during pregnancy can lead to giving birth to healthier infant.

Acknowledgments

We thank all of the participants for their cooperation.

Table 3: Correlation of mothers' and infants' anthropometric indices

Anthropometric indices	Infant's weight	Infant's height	Infant's head circumference
Mother height	r=0.14 P=0.027	r=0.15 P=0.022	r=0.18 P=0.006
Mother weight	r=0.23 P=0.001	NS	NS
Pregnancy weight gain	r=0.13 P=0.043	NS	NS

Pearson correlation has been done for all; NS: Not significant

Table 4: Relationship of mothers' characteristics and infants' anthropometric indices

Anthropometric indices	Infant's weight(gr)	P	Infant's height(cm)	P
Mother's characteristics				
Education				
Illiterate	3120±475		50.68±3.88	
Primary	3160±542	NS	51.32±3.27	NS
Diploma	3150±471		50.29±3.30	
Academic	3300±461		50.44±2.17	
Parity				
1	3090±517	NS	50.85±3.40	NS
2	3180±547		50.83±4.19	
≥3	3310±507		52.22±4.18	
Duration since pervious pregnancy(year)				
2	3340±679		51.50±3.58	
3-4	3180±513		51.32±5.55	
≥5	3150±471	NS	50.98±3.44	NS

ANOVA has been done for all; NS: Not significant

Conflict of Interest: None declared

References

- 1 Farah N, Stuart B, Donnelly V, Kennelly MM, Turner MJ. The influence of maternal body composition on birth weight. *European Journal of Obstetrics & Gynecology and Reproductive Biology* 2011; 157: 14-17.
- 2 Vahdaninia M, Tavafian S, Montazeri A. Correlates of low birth weight in term pregnancies: a retrospective study from Iran. *BMC Pregnancy and Childbirth* 2008; 8: 12.
- 3 Jahanian Sh, Ziaei S, Kazem nejhada A. Correlation of mother body mass index and weight gain during pregnancy and intra uterine growth retardation. *Scientific journal of Hamadan nursing and midwifery school* 2009; 7: 67-720.
- 4 Maddah M, Karandish M, Mohammadpour-Ahranjani B, Neyestani TR, Vafa R, Rashidi A. Social factors and pregnancy weight gain in relation to infant birth weight: a study in public health centers in Rasht, Iran. *Eur J Clin Nutr* 2005; 59: 1208-12.
- 5 Nahar S, Taylor CG, Begum HA. Maternal anthropometry as a predictor of birth weight. *Public Health Nutr* 2006; 10(7): 965-70.
- 6 Ay L, Kruithof CJ, Bakker R, Steegers EA, Witteman JC, Moll HA, et al. Maternal anthropometrics are associated with fetal size in different periods of pregnancy and at birth. *The Generation R Study. BJOG* 2009; 116(7): 953-63.
- 7 Nemat, A, Refahi S, Berak M, Jafari M, Etehad G. Correlation of mother anthropometric indices and infant birth weight in Alavi hospital of Ardebil. *Scientific journal of Ardebil university of medical sciences* 2007; 7(1): 84-9.
- 8 Jansena PW, Tiemeier H, Loomanb CW, Jaddoea VW, Hofmand A, Molle HA. Explaining educational inequalities in birthweight: the Generation R Study. *Paediatr Perinat Epidemiol* 2009; 23: 216-28.
- 9 Goshtasebi A, Banaem L, Alizadeh Rodbary M, Bakouei S. The Association Between Preconception Body Mass Index and Pregnancy Weight gain on Birth Weight. *Journal of Mazandaran university of medical sciences* 2011; 21(84): 81-5.
- 10 Moghaddam F, Saraswathi G. Maternal anthropometric measurements and other factors: relation with birth weight of neonates. *Nutr Res Pract* 2012; 6(2): 132-7.
- 11 Rodrigues PL, Oliveira LC, Santos Brito A, Kac G. Determinant factors of insufficient and excessive gestational weight gain and maternal-child adverse outcomes. *Nutrition* 2010; 26: 617-23.
- 12 Fallah MH, Afrouz GA, Heidari GA. Examining the Factors Effective on Birth Weight among Babies of Yazd Province in 2007. *Journal of Yazd health school* 2008; 7: 65-75.
- 13 Delaram M, Akbari N. Correlation of mother weight gain during pregnancy and infant birth weight. *Journal of Knowledge and health* 2008; 3(2): 39-43.
- 14 Zohour A. Correlation of first pregnancy weight gain and infant birth weight. *Journal of fertility and infertility* 2002: 33-9.
- 15 Erick M, Nutrition during pregnancy and lactation In: Mahan LK, Escott- stomp S. Krause s food and nutrition therapy. 12th edition, 2008, Saunders, USA, P: 163.
- 16 Tabande A, Kashani A. Correlation of mother body mass index and pregnancy weight gain and mother and infant complications. *Journal of Gorgan university of medical sciences* 2007; 9(1): 20-4.
- 17 Carnero AM, Meji CR, Garcı PJ. Rate of gestational weight gain, pre-pregnancy body mass index and preterm birth subtypes: a retrospective cohort study from Peru. *BJOG* 2012; 119: 924-35.