Maternal Stress and Low Birth Weight in Baghdad, Iraq: a Preliminary Report

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Abstract:

Background: Several reports demonstrated a high prevalence rate of low birth weight in Iraq, which was attributed to sanctions. This study was carried out to report on the effect of maternal stress on birth weight.

Materials: A total of 400 singleton newborns delivered in Elwayia Maternity Teaching hospital and Al-Habibia Maternity and Paediatrics Teaching Hospital, in Baghdad City during the period 15th June to 15 Nov. 2003 were included in the study. Information regarding the mothers were collected by direct interview. Data requested were gestational age, social support, and psychological stress. Birth weight was taken from case records.

Results: Half of the neonates were born with low birth weight. A significant association between low birth weights and stress scale was noticed. A negative significant association between social support and rate of low birth weight was demonstrated.

Conclusions: The finding of the study suggests that support intervention may an effective approach in reducing the rate of low birth weight.

Keywords: stress, low birth weight, social support, Iraq

Introduction:

Iraq is a unique situation with infant mortality rate (IMR) that has shown an upward trend [1-4]. IMR is highly correlated with the proportion of low birth weight (LBW) in the community [5-7]. Several reports demonstrated a high prevalence of LBW in Iraq during the last tow decades [2-4,8-11], which was attributed to sanctions. The caloric intake of Iraqi population was decreased to 1000 calories per person per day [12] for the period 1990 to 1997 and increased to lastly to 2475 calories [9].

A number of prospective studies have examined the influence of social support during pregnancy on birth weight and length of gestation [13-15]. No previous report demonstrated the effect of maternal stress on birth weight in Iraq. Therefore, this work was carried out to report the effect of stress on birth weight.

Materials and Methods:

A total of 400 singleton newborns delivered in Elwayia Maternity Teaching Hospital and Al-Habibia Maternity and Paediatrics Teaching Hospital, in Baghdad city during the period 15th June to 15th Nov. 2003 were included in the study.

Information regarding the mothers was collected by direct interview. Data requested were gestational age, social support (family support [16], husband support [16] and interpersonal support [17]) and psychological stress which measured by interview using perceived stress scale (PSS) [18,19]. Birth weight was taken from case records.

Multiple logistic regression was used to examine the effect of social support and psychological stress on birth weight independently. Student's t test was used to examine the association of maternal stress

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(independent variable) with the birth weight (dependent variable). P value less than 0.05 was considered significant.

Results:

Half of the neonates were born with LBW. Psychological stress among women who delivered LBW infants (93.7 ± 15.2) was significantly higher than the scale among women who delivered infants with normal weight (86.6 ± 19.6) ($p < 0.05$) (Table 1).

Table 2 shows a negative significant association between social support with the prevalence of LBW ($p = 0.003$). Maternal stress was significantly associated with the prevalence of LBW ($p = 0.02$).

Table 1 Maternal psychological status according to the birth weight of their infants

Birth weight	Total No.	Maternal psychological status
		Mean ± SD
LBW	**200**	**93.7 ± 15.2**
Normal birth weight	**200**	**86.6 ± 16.9**

Table 2 Association of social support and stress with LBW

Variable	LBW		
	β	**SE**	**P value**
Social support	**- 1.2**	**1.8**	**0.003**
Stress	**0.8**	**0.5**	**0.02**

Discussion:

The finding that birth weight was significantly associated with maternal stress is consistent with that of other investigators [6,13-19]. They reported that maternal prenatal stress factors independent on biomedical risk are associated with infant birth weight and gestational age at birth. However, other workers [20] found that neonatal outcome did not deteriorate despite the women's impaired mental health during pregnancy. Prenatal obstetric risk assessments predict, at most, one third to two third of all poor birth outcomes [21,22].

To identify unknown medical and biological risk factors, attention was paid to potential role of maternal psychological factors on birth weight and length of gestation. Stress was associated with spontaneous preterm birth and LBW [19,23].

Recently, workers from Iraq reported a high prevalence of LBW [10,11] (51.8% and 50%, respectively) than that reported previously [24,25,9] (15%, 13.3% and 21%, respectively). The dramatic increase in the prevalence of LBW was attributed to low caloric intake of Iraqi population [12] during sanctions.

Low caloric intake leads to low pregnancy body mass index and low gestational body gain, which are the most important established determinants of restricted fetal growth [26,27]. Several workers documented a high maternal stress during gulf wars and sanctions [9,28,29].

Recent reports [10,11] out of Iraq demonstrated that 80% and 83%, respectively, of LBW were preterm, which are much higher than that reported by Stoll and Kleigman [30] in developing countries (30%). The association between maternal stress and preterm delivery is documented in medical literature [16-19,31,32]. High maternal stress during the last decades [27,28] may be attributed for this finding.

Researchers had suggested that responses of the endocrine axis to psychosocial factors during pregnancy may affect maternal nutrition, uteroplacental hemodynamics, endocrine alteration and placental pathophysiology, which in turn contribute to fetal growth restriction and low birth weight [33,34]. Elevated levels of hypothalamic pituitary, adrenal and placental stress hormones (e.g. corticotrophin releasing hormone and ACTH) have been implicated in LBW due to intrauterine growth retardation (IUGR) [33,34]. Similarly, vasoconstriction and hypoxia in response to activation of the sympathetic- adrenal medullar system decrease uteroplacental perfusion and may thereby contribute to fetal growth restriction and LBW [35]. Maternal plasma levels of the principle pituitary- adrenal stress hormones (ACTH, β-endorphin and cortisol) measured at the beginning of the third trimester of pregnancy have been correlated with prenatal stress, personality factors and social support [36].

In this study, a significant negative association of social support with LBW is in agreement with that of other workers [23,37,38]. Social support may influence etiological processes related to fetal growth by enhancing positive health behavior and promoting healthier life styles in pregnant women.

Behavioral risk factors linked to IUGR include inadequate nutrition, poor weight gain, smoking and substance abuse [38-40]. Nutritional deficiencies and smoking are the most important pathways examined that they

are the primary behavior predictors of IUGR[40]. Women who perceive that more support is available to her during pregnancy may also seek health related information and receive prenatal care earlier in their pregnancy [31].

The findings of this study may suggest that support intervention may be an effective approach to reducing the rate of LBW.

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