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ZINC DEFICIENCY IN PREGNANCY AND POSTPARTUM DEPRESSIN

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Abstract

Maternal zinc deficiency during pregnancy has been related to adverse pregnancy outcome. Recently, zinc deficiency has been on the focus as causing depression. The study was conducted to the determine the relation between zinc deficiency in pregnancy and postpartum depression. This prospective describe-analytical study was conducted on the population of women admitted to Fatemmie hospital in Hamedan city in west of Iran in 2011 .The study sample included 132 normal (non depressed confirmed by the beck test) pregnant woman who were selected by convenient non-probability methods. Blood sample were collected from pregnant cases in 38-40 weeks and serum zinc was assessed by Enzymatic technique. Standard values under 85 mg/dl were defined zinc deficiency. In 28th days after delivery, they completed the Edinburgh Questionnaire. The relation between their postpartum depression and zinc deficiency was assessed. There was no significant difference in demographic in the between two groups. The results showed that zinc deficiency had increased the chance of postpartum depression (p<0.001).

***Keywords**: zinc deficiency, postpartum depression*

1. Introduction

Women, especially women of child-bearing age, are at high risk of depression (Escriba`-Agu¨ir & Artazcoz 2011). PPD is a condition occurring in the post-natal period characterized by depressed mood, lack of energy, disruptions of sleep and appetite, loss of interest in previously enjoyable activities, (Crayton & Walsh, 2007); irritability, excessive physical complaints, lack of libido (Zauderer, 2009), (Gjerdingen et al, 2009). Women with PPD may also have recurrent thoughts of death or suicidal ideation, or recurrent thoughts about harming the baby. The onset of PPD may be as early as 4 weeks but is most commonly diagnosed between 6 and 12 weeks postpartum (Posmontier 2008). Postpartum depression (PPD) is a significant public health concern. (Krause et al 2009) Maternal depression is very common globally, the prevalence of which ranges from 15% in the United States to 35% in low-income. Furthermore, the average prevalence of maternal postpartum depression within 6–8 wk after childbirth is 13% in the general population. (DiGirolamo & Ramirez-Zea 2009) Postpartum depression is a mood disorder that has harmful effects on mothers, infants, family and relationships (Nikseresht, 2010) The consequences of postnatal depression on child development in early infancy, later infancy and early childhood have been the focus of a number of studies, with cognitive, emotional and social development potentially affected. (Leigh & Milgrom, 2008). Therefore, identifying and treating depression early is a well recognized, public health priority

(Segre et al, 2010) Furthermore, depression appears to be more severe in postpartum women and has an increased risk of recurrence. (Krause et al, 2009) Screening for depression in postpartum women is strongly encouraged. (Segre et al, 2010) Given the high prevalence and serious consequences of postnatal depression, efforts have been made to identify risk factors to assist in prevention, identification and treatment. (Leigh & Milgrom, 2008). Most observers consider a history of depression, antenatal depression (Posmontier, 2008), stressful life events, low social support, marital problems (Escriba`-Agu¨ir & Artazcoz, 2011) antenatal anxiety, negative cognitive attributional style, low self-esteem, and low income Other risk factors for postnatal depression cited in the literature include young age, fewer years of education, a history of miscarriage and pregnancy termination and a history of childhood sexual abuse (Leigh & Milgrom, 2008) to be implicated in the development of depression, but there is little information available about biological factors.

Zinc, one of the biological factors. The importance of zinc was first documented for Aspergillus niger. It took over 75 years to realize that zinc is also an essential trace element for rats and an additional 30 years went by before it was recognized that this was also true for humans. (Hasse et al, 2008) Zinc is one of the most important micronutrient with essential role in biochemical regulation of the body functions (Arast, 2009) Zinc is a cofactor for polymerases and proteases involved in many cellular functions (e.g., wound repair, intestinal epithelial cell regeneration). Zinc has antioxidant properties and may protect against macular degeneration from oxidative stress (Saper & Rash, 2009) Due to the wide prevalence of zinc deficiency and the multitude of zinc's essential biological functions, nutritional correction of zinc deficiency may have a significant impact on different aspects of human health. (Hasse et al, 2008). The prevalence of zinc deficiency is estimated to be high, with billions of people at risk, in particular in the developing world (Saper & Rash, 2009) The importance of zinc in pregnancy period was widely studied in various countries. Variation in zinc plasma levels during pregnancy needs more investigation, because maternal zinc deficiencies may cause some severe abnormalities in the fetus (arast 2009) The first clinical findings published by Hansen et al. indicated low serum zinc levels in treatment resistant depressed patients. Low serum zinc level was late found in major depressed and minor depressed subjects. (Szewczyk et al, 2010) Siwek and associated in 2010 suggest that Recurrent major depression is associated with decreased blood zinc concentrations that may be increased by effective antidepressant therapy. Given the negative implications of postpartum depression on health and wellbeing of mother and child, the current study aimed to examine prospectively the relationships among zinc deficiency and symptom of depression in Fattemieh hospital in city of Hamedan in west of Iran.

Method

This prospective describe-analytical study was conducted on the population of pregnant women (mean gestation weeks = 38-40) admitted to the maternity hospital of Fatemieh in city of Hamedan in west of iran during 9-month period in years of 2011 .The sample consisted of 132 normal pregnant women (non depressed confirmed by the beck test) ranging in age from 20 to 35 years who were selected by convenient non-probability method.

Our exclusion criteria were as follow : gestational diabetes, thyroid disorder, preeclampsia, history of infertility and stillbirth, unplanned pregnancy and history of depression .

All the subjects were explained about the purpose of the study and were ensured strict confidentiality. Written informed consents were taken from each of women.

All participants also reported their age, parity status, level of education, annual household income, marital status and history of abortion. Following University ethics approval, women currently 38 to40 weeks pregnant were invited to participate in a study. Blood samples were collected from pregnant cases and serum zinc was assessed by Enzymatic technique. Standard values under 85 mg/dl were defined zinc deficiency.

At this time, They were divided into two groups of Zinc deficiency (n= 68) and normal zinc (n = 64) by their zinc levels. They were homogenized as for the confounders.

On the 28th days after delivery ,they completed the Edinburgh questionnaire.

We assessed depression with the 10-item Edinburgh Postnatal Depression Scale (EPDS), a widely used self-report screening measure, at postpartum. We chose the EPDS because it has been validated for postpartum use and does not include somatic items, such as weight change, loss of energy, and tiredness that may be misleading as indicators of depression in the puerperal period. A score >12 indicates probable depression. Validation of the scale against diagnostic clinical interviews indicated a specificity of 78% and a sensitivity of 86% for all forms of depression. (Herring et al 2008)

The relationship between their depression and zinc deficiency in 38-40 was assessed. SPSS (SPSS Inc., Chicago IL) statistical software was used for data analysis. All hypothesis tests were two-sided and P-values<.05 were considered statistically significant.x^2, t-test ,mann Whitney, v-cramer and relative risk were used to analyze the obatained data.

Results

No statistically significant difference was noted in duration of marriage (4.27 ± 2.21 and 3.90 ± 1.53) ,socioeconomic (0.05 ± 1.02 and 0.05 ± 0/98), granida (60.9% and 61.8% no delivery), history of abortion (10/9 % and 7.4 %)and satisfaction of marriage (69.24 ±10.88 and 70.84 ± 10.47) between normal zinc and zinc deficiency groups ,respectively.

Participants' age ranged from 20 to 35 years (M=26.97 years, SD=3.75 and M=26.51 years, SD=4.31) in normal zinc and zinc deficiency groups ,respectively.

At 38-40 weeks of pregnancy 68 women were placed in zinc deficiency and 64 women in normal zinc. 14.1% of the normal zinc and 38.2% of the zinc deficiency were found depressed on the 28th day after delivery and zinc deficiency had increased the chances of postpartum depression by 3.78 times.(p<0.001). It seems that zinc deficiency during pregnancy can increase the likehood of postpartum depression.

Table 1: Comparison of depression on normal and zinc deficiency groups

Postpartum depression	Zinc deficiency	Normal zinc	
n	%	n	%
No	42	61.8	55 85.9
Yes	26	38.2	9 14.1
	68	100	64 100

Conclusion

The results indicated that zinc deficiency at 38-40 weeks gestation predicted, prospectively, increased depressive symptoms at 28 days after delivery.

This supported the proposed hypotheses and extended findings of our previous research suggesting that women's experiences of zinc deficiency may have clinical implications for the development of postpartum depression.

Musavi and associated in 2006 expressed that major depressed subjects show significantly lowered serum zinc concentration. Results of this study, according to our study. DiGirolamo and associated in 2009 expressed similar results .Siwek and associated in 2010 expressed that Serum zinc is a state marker of depression.

Szewczyk in 2010 showed that IRS activation is accompanied by a decrease in serum zinc level. In fact, in patients with major depression, a low zinc serum level correlated with an increase in the activation of markers of the immune system. Thus, these findings raise the hypothesis that the lower serum zinc observed in depressed patients may, in part, result from a depression-related alteration in the immune-inflammatory system. The other data supporting an important role of zinc in depression comes from the findings that the lower serum zinc level observed in depressed patients could be normalized by successful antidepressant therapy.

However so further well-designed, adequately powered research is required .Lai and associated in 2012 suggest that potential benefits of zinc supplementation as a stand-alone intervention or as an adjunct to conventional antidepressant drug therapy for depression. Given symptoms of antenatal and postnatal depression are highly correlated, further research should evaluate the impact of antenatal experiences of zinc deficiency and indirectly via postpartum depression.

Zinc deficiency in third trimester of gestation could be due to malnourishment or other conditions such as plasma expansion during pregnancy. Enhancing the daily uptake of zinc at the third trimester could be supportive.(arast et al 2009)Zinc can improve depressive symptoms by nitrergic pathway. This element as supplement compounds could be alternatives for antidepressants in postpartum period. (Nickseresht 2010)

The findings are limited as the relationships of earlier zinc deficiency with postpartum depressive symptom. Our findings indicate the importance of screening for the possible impact of zinc deficiency in earlier stages, to enable early treatment and even prevention of the development of antenatal and postpartum depression.

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