

Post Partum Depression and Thyroid Function

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Objective: Risk of depression is particularly high for women during the prenatal period. Various investigators have attempted to establish a link between thyroid function and post partum depression. This study aimed to investigate whether thyroid function differs in women with postpartum depression compared to a control group.

Methods: In this case-control study, subjects were selected from Obstetrics & Gynecology and Psychiatric clinics of Kermanshah University of Medical Sciences. Forty eight patients suffering from postpartum depression according to Diagnostic and Statistical Manual of Mental Disorders, fourth edition totally revised (DSM-IV-TR), and 65 normal controls underwent diagnostic evaluation by one trained psychiatrist using Structured Clinical Interview for DSM-IV-TR. Then, the demographic questionnaire and the Persian version of Edinburgh Postnatal Depression Scale (EPDS) were completed by the participants. Finally, their thyroid functions were assessed. Data analyses were done using the SPSS program 13.

Results: No statistically significant differences were observed between thyroid function tests and postpartum depression. According to multiple regression analysis with stepwise method, subjects with lower serum TSH, T3RU, T3 levels, younger age and longer period after delivery tended to have higher EPDS scores (P-value=0.008).

Conclusion: The present study reports that those women with postpartum depression had a no greater prevalence of thyroid dysfunction than the control subjects. It seems that thyroid dysfunction should be considered in women with postpartum depression individually, but the role of thyroid as an important cause of this condition is not yet established. This suggests that future studies should concentrate on this concept in postpartum depression.

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Risk of depression is particularly high for women during the prenatal period, with 10 to 15 percent of postpartum women experiencing a major depressive episode during this time (1). According to the Diagnostic and Statistical Manual of Mental Disorders, fourth edition totally revised (DSM-IV-TR), (2) an episode of depression is considered to have postpartum onset if it begins within four weeks after delivery. However, onset within three months after delivery is the time frame commonly used by investigators on the basis of epidemiologic studies (3). It may have a deleterious effect on the woman's social and personal adjustment, her marital relationship, and the mother infant interaction.(4) Furthermore, maternal depression early in the infant's life may affect the child's psychological development with significant intellectual deficits as a result.(5-7) Various explanatory models on the etiology have been proposed; probably

postpartum depression is a result of an interaction between genetic vulnerability, hormonal changes, and major life events.(8,9). Psychosocial stressors, prenatal risk factors, previous psychiatric history, complications during pregnancy, delivery, and the prenatal period are associated with an increased risk of postpartum depression. (10) Thyroid function is known to be affected during pregnancy (11), while the pathogenesis of postpartum mood disturbances remains unclear. However, various investigators have attempted to establish a link between thyroid function, usually accompanied by autoimmune thyroiditis, with postpartum mood disorders (12-14). Furthermore, both hypothyroidism and hyperthyroidism, even subclinical, may lead to depressive symptomatology (15, 16). This study aimed to investigate whether thyroid function differs in women with postpartum depression compared to a control group.

Materials and Method

We conducted a case-control study to assess thyroid function in postpartum depression. Forty eight patients suffering from postpartum depression according to DSM-IV-TR, and sixty five normal controls entered the study. Subjects were selected from Obstetrics & Gynecology and Psychiatric clinics of Kermanshah University of Medical Sciences from November 2010 to May 2011. Patients and controls were free of any medication and were physically healthy with no previous history of thyroid & mental disorders according to past medical history. Subjects were eligible if they were in 30-90 days after delivery. The written informed consent was obtained from each subject, and they underwent diagnostic evaluation by one trained psychiatrist using Structured Clinical Interview for DSM-IV-TR ; then they completed the demographic questionnaire and the Persian version of Edinburgh Postnatal Depression Scale (EPDS). Finally their thyroid functions were assessed.

The Edinburgh Postnatal Depression Scale is a 10-item self-report scale, specifically designed to screen for postpartum depression in community samples (17). Each item is scored on a 4-point scale (0–3), the minimum and maximum total score ranging from 0 to 30, respectively. The EPDS has been translated into Persian and validated in Iranian people (18). The EPDS cannot confirm a diagnosis of depressive illness, but when selecting this threshold, the sensitivity for the detection of major depression was almost 100% and the specificity was 82%.33. The EPDS is easy to administer, takes only a few minutes to complete, and is well accepted by the women and the staff.

T3 was assessed by Radio Immuno Assay (RIA) kit . Normal values are 1.25-2.50 nmol/L. T4 was assessed by Radio Immuno Assay (RIA) kit . Normal values are 65-138 nmol/L. The Thyroid Stimulation Hormone (TSH) was assessed by Radio Immuno Assay (RIA). Normal values are 0.36–3.98 mIU/L. T3 resin uptake (T3RU) assessed by Radio Immuno Assay (RIA). Normal values are 30-40%. Normal values of FTI are 5-11. All analyses were done using the SPSS program 13. Statistical significance was defined as two-sided

P values using a significance level of 0.05. Differences were tested with Student t-test for normally distributed continuous variables. Chi square tests were used for categorical variables. Multiple regression with stepwise method was used when multiple variables were considered simultaneously.

Results

In this study, 185 women were selected from Gynecology& Obstetric and Psychiatric clinics in their postpartum period and were assessed with Structured Clinical Interview for DSM-IV-TR, the demographic questionnaire and EPDS. Of them, 72 refused to participate in thyroid function testing.

Table 1. The results of thyroid function in postpartum depression and control group

Variables	Postpartum depression	Mean	t-test p-value
T3 RIA nmol/lit	yes	1.73	0.19
	no	1.78	
T4 RIA nmol/lit	yes	93.71	0.24
	no	90.31	
TSH IRMA mIU/lit	yes	2.33	0.16
	no	2.69	
T3RU RIA %	yes	33.43	0.18
	no	34.07	
FTI	yes	7.17	0.53
	no	6.99	

Table 2. Postpartum Depression by Subjects Characteristic: Results of χ^2 Test Analysis

Variables	Number	Postpartum depression		P-value
		YES	NO	
Thyroid function				
Euthyroid	113	48	65	0.97
Hypothyroid	90	38(79.2%)	52(80%)	
Subclinical hypothyroid	5	2(4.2%)	3(4.6%)	
	18	8(16.7%)	10(15.4%)	
Parity				
One	113	48	65	0.005
Two	47	20(41.7%)	27(41.5%)	
Three	26	18(37.5%)	8(12.3%)	
Four and more	30	8(16.7%)	22(33.8%)	
	10	2(4.2%)	8(12.3%)	
Infant feeding				
Breast feeding	113	48	65	0.43
Formula	77	30(62.5%)	47(72.3%)	
Both	18	10(15.4%)	8(16.7%)	
	18	8(12.3%)	10(20.8%)	
Occupation				
Housewife	113	48	65	0.97
Others	99	42(87.5%)	57(87.7%)	
	14	6(12.5%)	8(12.3%)	
Education				
Elementary school	113	48	65	0.65
High school	38	16(33.3%)	22(33.8%)	
Academic	57	26(54.2%)	31(47.7%)	
	18	6(12.5%)	12(18.5%)	
Type of delivery				
Natural delivery	113	48	65	0.26
Cesarean	45	22(54.8%)	23(35.5%)	
	68	26(54.2%)	42(64.6%)	
Desired Pregnancy				
Yes	113	48	65	0.07
No	85	32(66.6%)	53(18.5%)	
	28	16(33.3%)	12(18.5%)	
Child gender				
Male	113	48	65	0.16
Female	51	18(37.5%)	33(50.8%)	
	62	30(62.5%)	32(49.2%)	
Postpartum hemorrhage				
Yes	113	48	65	0.054
No	8	6(12.5%)	2(3.1%)	
	105	42(87.5%)	63(96.9%)	

Of the other 113 subjects, 48 were in depression group and 65 in control group.

Participants in this study had an age range of 19 to 41 years with a mean of 26.88 and 29.12 years in case and control group respectively (P-value <0.05). EPDS scores ranged from 1 to 12 in case and 14 to 30 in control group with a mean of 6.34 & 21.02 respectively (P-value <0.05). No statistically significant differences were observed between thyroid function tests and postpartum depression (Table 1). In addition, no correlation was found between postpartum depression and thyroid dysfunction.

According to chi square test analysis of subjects' characteristics (Table 2), only parity had significant relation with postpartum depression (P-value <0.05). According to multiple regression analysis with stepwise method, subjects with lower serum TSH, T3RU, T3 levels, younger age and longer period after delivery tended to have higher EPDS scores (P-value=0.008). The correlation co-efficient (r) was 0.58. The co-efficient of determination, r^2 , was 0.34. In other words, about 34% of the variability of EPDS scores is associated with these variables.

Discussion

In our study, information regarding a wide range of potential risk factors was collected. Younger age and parity were two risk factors which had significant relation with postpartum depression (PPD). Studies looking at the possible effect of number of parities on PPD are controversial. One study reported no difference in PPD between primipara and multipara women, but reported a two-fold increase in the incidence of postpartum psychosis, with no age correlation (19). Some studies have shown a possible association between the first childbirth and PPD (20) and others did not find an association between the number of deliveries and PPD (21). According to our results other demographic and obstetric factors had no significant relationship with postpartum depression. However, a potential weakness of this study might be a smaller sample size compared to other epidemiological studies.

The present study reports that those women with postpartum depression had a no greater prevalence of thyroid dysfunction than control subjects, and mean thyroid function indexes (T4, T3, TSH, T3RU, FTI levels) had no significant differences between two groups. There are several papers suggesting that the thyroid function of depressed patients is within the normal range (22-27).

On the other hand, some studies showed a relation between thyroid dysfunction and postpartum depression. Thyroid antibody-positive women are prone to hypothyroidism, which is often preceded by transient hyperthyroidism after delivery (28). In addition, lower range total and free thyroxine concentrations during late pregnancy may be related to postpartum depressive symptoms (29). The presence of abnormal thyroid function tests is not related with a

distinct clinical picture (30). However, again, the literature is split and the results are inconclusive (31-33).

Our findings showed that T3, TSH and T3RU levels correlated negatively with EPDS scores. One study suggests that women with T4 and FT4 in the lower euthyroid range and higher T3RU had higher EPDS ratings (34); another study suggests that subjects with higher serum TSH tended to have higher EPDS scores (35).

Overall, the review of the literature suggests that there are no conclusive data on the role of thyroid function in postpartum depression. It seems that thyroid dysfunction should be considered in women with postpartum depression individually, but the role of thyroid as an important cause of this condition is not yet established.

The main limitations of this study are the small sample size and lack of thyroid autoimmune assessment. We suggest that studies with larger sample sizes be conducted to further evaluate thyroid autoimmune tests to clarify the role of thyroid function in postpartum depression.

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