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DEPRESSION: AN UNDERESTIMATED EFFECT OF INFANTILE COLIC ON MOTHERS

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ABSTRACT

Objective: To measure the psychosocial status of mothers who had babies with infantile colic (IC) in a prospective-design study.

Methods: This prospective, randomized and controlled study was conducted between April 2013 and October 2013 in the Istanbul Medipol Hospital. Mothers and their newborns were stratified into two groups as Group A (colicky infant mother dyad [n: 47]) and Group B (non-colicky infant-mother dyad [n: 48]). Maternal symptoms of depression and anxiety were assessed using the Beck Depression Inventory Test (BDI). Test results were graded by the observing psychologist. Age, education level, number of siblings, dietary habits, and active work life status information were also compared between the groups.

Results: Mean BDI score in Group A (14.7 ± 12.9) was significantly higher than in Group B (7.7 ± 5.5) ($p=0.001$). The depression scores were lower in mothers with active work lives than housewives ($p < 0.001$) and in mothers of breastfed babies than for those of formula-fed babies ($p < 0.05$).

Conclusion: Infantile colic (IC) was associated with higher maternal depression symptom scores. As such, we think that mothers of babies with infantile colic might have higher tendencies toward depression, and therefore, infantile colic's secondary effects must be taken seriously.

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INTRODUCTION

Infantile colic (IC) is a common but poorly understood problem during infancy (Akhnikh *et al.*, 2014). Despite plenty of researches the cause of infant colic remains unsolvable. IC is often defined by the Wessel's criteria of severe sobbing fits lasting more than 3 weeks, occurring at least 3 days in a week, continuing more than 3 hours (Waddell, 2013 and Chinawa *et al.*, 2013). Although the etiology of IC is not exactly known, some medical hypotheses such as food hypersensitivity and allergy, immaturity of gut function and dysmotility, inadequate maternal-infant interaction have been reported (Abaci *et al.*, 2013). Psychosocial hypotheses include poor maternal-infant interactions and maternal anxiety and depression. The effect of maternal depression on IC remains as a dilemma. Even though some authors stated IC as a result of maternal depression, a number of authors expressed an opposite opinion about this topic. According to second opinion maternal depression may be related to IC (Vik *et al.*, 2009; Akman *et al.*, 2006; Mhaske *et al.*, 2012; Savino, 2007; Rao *et al.*, 2004 and Radesky *et al.*, 2013).

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In addition maternal depression may lead to further psychotic state in some patients, and minority of cases may end up with suicide. This study has a purpose to investigate the relationship between maternal depression and IC by using Beck's Depression Inventory, and also to correlate the changes in Beck's Depression Inventory with sociodemographic factors in our territory

MATERIALS AND METHODS

A cross sectional survey of 96 mothers seen at the Pediatric Clinic of Medipol University Hospital, between 04 and 10 October 2013 was done. Forty-seven mothers who have 30–90-day-old babies diagnosed with IC according to Wessel's definition and 46 mothers who have children without any health problems at the same age were enrolled to this study. Exclusion criteria, which were applied to mothers for both groups were; providing care for a chronically ill family member; carrying for another child younger than 18 months; needs special health care and having chronic health problems (physical and/or psychological). Also babies with any inborn or acquired illnesses or anomalies were not included in this study. Among these, mothers of 47 babies with infantile colic were assigned to the study group (SG), and those mothers of

48 babies who did not suffer from infantile colic were assigned to a control group (CG). At this stage, mothers were given a questionnaire called the 'Beck Depression Scale' under the scrutiny of a clinical psychologist.

Table 1. Evaluation of Beck Depression Scale

Points	Classification
0–9	Normal
10–18	Mild Depression
19–29	Moderate Depression
30–63	Severe Depression

The Beck Depression Scale is a self-evaluation scale used to determine the risk of depression and to measure the level of depressive symptoms and shifts in severity. It consists of 21 items with responses on a 4-point Likert scale. Each item is given points between 0 and 3. The highest amount of points achievable is 63. Higher total scores indicate more severe depression (Beck *et al.*, 1990). Evaluation of the results was carried out as in Table 1. Test results were graded by the observing psychologist. This study was conducted with the highest respect for the Declaration of Helsinki and relevant laws/regulations. Written informed consent was obtained from the mothers on their own behalf, and from both parents on behalf of each child. The study protocol was approved by the Ethics Committee of Medipol University.

Analyses were performed using the Statistical Package for the Social Sciences (SPSS) v.17.0 for Windows (SPSS Inc., Chicago, IL). Numerical variables are expressed as mean \pm SD. Categorical variables are shown as number and percentage. Variables were compared using the t-test, chi-square (χ^2) test, and linear regression test. Statistical significance was set at $p < 0.05$

RESULTS

Infant and mothers characteristics are shown in Table I. There were no significant differences in age, education, employment, number of siblings, mode of the nutrition between the mothers in Groups 1 and 2. Mothers of 47 babies with infantile colic scored, on average 13.12 ± 4.06 points on the Beck depression scale while mothers with babies without infantile colic scored on average 7.85 ± 2.65 points. There was a significant difference between these Figures. In the groups, it was observed that the SG's average score on Beck's depression test was significantly higher than that of the CG ($p < 0.001$). The SG participants' age, education level, number of siblings, dietary habits, and active work life status information can be found in Table 2. In Table 3, the patients in the SG and CG are compared according to both demographic characteristics and Beck depression scale ratios.

Table 2. Regression analysis of the study subgroup parameters and Beck Scores

Parameter	SubGroups		Beck score	P†
Maternal age (y)	<20	3 (6%)	12.32 \pm 2.65	0.000
	20–25	14 (31%)	10.22 \pm 2.14	
	25–30	20 (42%)	9.65 \pm 2.3	
	≥ 30	10 (21%)	7.75 \pm 2.24	
Maternal education	Primary school	5 (10%)	8.5 \pm 2.2	0.01
	High school	25 (54%)	10.7 \pm 3.5	
	University and postgraduate	17 (36%)	12.55 \pm 3.4	
Number of siblings(n)	0	7 (15%)	11.45 \pm 2.33	0.01
	1	26 (55%)	10.4 \pm 2.4	
	2	8 (17%)	8.8 \pm 2.7	
	≥ 3	6 (13%)	7.5 \pm 1.7	
Working mother	Yes	17 (36%)	8.65 \pm 2.5	0.001
	No	30 (64%)	10.85 \pm 2.7	
Nutrition	Breastfeeding	14 (30%)	8 \pm 2.7	0.001
	Formula	33 (70%)	12 \pm 2.4	

† Linear Regression Analysis

Table 3. Demographic characteristics and Beck depression scale ratios

Parameter	Subgroups	Infantile Colic Yes N (%)	Infantile Colic No N (%)	p
Maternal Education	Primary	5 (10%)	8 (16%)	0.676
	High-school	25 (54%)	24 (51%)	
	University and postgraduate	17 (36%)	16 (33%)	
Number of siblings	0	7 (15%)	6 (12.5%)	0.274
	1	26 (55%)	25 (52%)	
	2	8 (17%)	10 (21%)	
	≥ 3	6 (13%)	7 (14.5%)	
Working mother	Yes	17 (36%)	20 (42%)	0.542
	No	30 (64%)	28 (58%)	
Maternal age	<20	7 (15%)	2 (4%)	0.428
	20–25	17 (36%)	17 (36%)	
	25–30	20 (42%)	22 (45%)	
	30	3 (6%)	7 (15%)	
Nutrition	Breastfeeding	14 (30%)	30 (62.5%)	0.005
	Formula	33 (70%)	18 (37.5%)	
Beck Scores		13,12 \pm 4,06	7,85 \pm 2,65	0.001

‡ chi-square (χ^2) test

When data between the two groups were compared, a significant difference was observed between the children who were breastfed only and those who were formula-fed. It was observed that breastfeeding significantly decreased the frequency of infantile colic. The SG was classified with sub-categories according to age, education levels, number of siblings, and having active work life or not. When the correlation between the mother's age and Beck depression score was examined, it was observed that the lower the mother's age, the higher the depression score; on the other hand, the higher the education level, the higher the depression score. When the regression between the number of siblings in the SG and Beck depression score was considered, the higher the number of siblings was, the lower the depression score was (Table 2). It was also found that the depression score was lower for mothers with active work lives and quick return to work during the postpartum period than for housewives ($p < 0.001$). The depression score was lower for the mothers of breastfed babies than for those of formula-fed babies ($p < 0.05$).

DISCUSSION

Infantile colic is a relatively common condition of early infancy without a clear etiology. It is observed in almost one out of every four babies and characterized by excessive and inconsolable crying (Savino *et al.*, 2004). In this study, we aimed to investigate the relationship between maternal depression and infantile colic. Although no discrepancy has been detected in the literature between infantile colic and the criteria we examined, the most prominent relationship was observed in the babies' method of feeding (Cohen Engler *et al.*, 2012). Infantile colic has a substantial negative effect on the quality of life for both the new-born infant and his or her family. Although some previous studies have suggested the elevated levels of maternal anxiety as a contributing factor in infantile colic's development, excessive crying both 2 and 6 months after birth are significant risk factors for secondary physical and psychological problems, especially for mothers (Vik *et al.*, 2009; Akman *et al.*, 2006 and Clifford *et al.*, 2002).

In this current study, we found that breastfeeding significantly decreased the frequency of infantile colic. This might be related with melatonin effect in human milk associated with reduced colic attacks or as expected generally related to sensational maternal-infantile interaction (Clifford *et al.*, 2002). One of the interesting finding in our study is the higher the mother's age and number of siblings, the lower the infantile colic frequency. We thought that the advanced parental skill of experienced mothers facilitated overwhelming problems. Thus, this may influenced our results. Consistently with literature, the relationship between mother's education level and depression score could be explained with the increase in awareness of serious illnesses such as in differential diagnosis of the infantile colic (Abaci *et al.*, 2013; Akman *et al.*, 2006 and Clifford *et al.*, 2002).

In a novel finding, our study suggests that mothers who start to work early 60% less likely to develop depression, relative to mothers were not. Since a quick return to active work life might have prevention effect on psychological problems

experienced by the mother during the postpartum period, a quick return positively affected depression score in our sample. As mothers of babies with infantile colic had higher depressive scores in our study, similar results were obtained in another study conducted in Ankara, Turkey. Mothers of babies with infantile colic got an average score of 14.7 ± 12.9 , and mothers of babies without infantile colic got an average score of 7.7 ± 5.5 ($p=0.020$) (Yalcin *et al.*, 2010).

Although the average scores of the mothers in the SG were interpreted as 'minor psychological distresses. This situation must alert because endogenous changes in psychological states of postpartum mothers or and external stressors may contribute to postpartum depression. Postpartum depression is one of the important psychiatric disorders which lead to suicide and 'postpartum psychosis' (O'hara *et al.*, 1996). Our study has several limitations. First, our study is based on subjective reports and not on objective measurements. Second, all mothers were recruited at the same clinic, from the same socioeconomic status and the family unit composition and we believe that this potential bias is psychosocial. Thirdly, Edinburgh Postpartum Depression Scale is another scale used to detect postpartum depression. Comparing Edinburgh Postpartum Depression Scale and Beck's Depression Inventory among the same test group might give more successful results and this could be the limitation of our study. Nevertheless, despite these limitations, we believe our results express a real difference and indicate that going back to work earlier than 6 months is associated with lower depression scores, which may potentially result from positively affected mood via the social life during the day.

Conclusion

Finally, babies should be evaluated together with their mothers. Pediatric health problems affect physical and psychological well-being of mothers as well. Infantile colic, which is not regarded as a very important problem for babies, should be taken seriously since it may lead to lasting health problems in mother. Working mothers should be encouraged to return to work life early as they can during the postpartum period.

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