

Original contribution

Maternal bond and mother–child interaction in severe postpartum psychiatric disorders: Is there a link?

Ch. Hornstein, P. Trautmann-Villalba, E. Hohm, E. Rave, S. Wortmann-Fleischer, and M. Schwarz

Mother Baby Unit, Department of General Psychiatry and Psychotherapy, Psychiatric Centre Nordbaden, Wiesloch, Germany

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Summary

Mothers in the puerperium are vulnerable to a wide spectrum of postpartum psychiatric disorders. One of the central psychological processes of the puerperium is the development of an emotional relationship with the baby. The bond to the infant as well as the interaction with the baby are two aspects of the mother–infant relationship that can be disturbed by mothers with postpartum psychiatric disorders. Dysfunctional maternal cognitions may also influence the development of an emotional bonding and the establishment of a positive interaction with the child. The aim of this study is to investigate differences in the self-perceived experience of bonding and the observed mother–child interaction of severely ill postpartum depressive and psychotic mothers. In addition the association between subjective experience of bonding and objective measurement of mother–child interaction will be described. Results show that depressive mothers perceived their bonding to the baby more negatively than psychotic mothers. No differences could be found in the objective interactional behaviour of the mothers in both groups, with the exception that the infants of psychotic mothers showed more eye contact avoidance towards their mothers. The subjective experience of motherhood clearly influences the maternal interactional behaviour with depressive mothers as well as with psychotic mothers.

Keywords: Postpartum disorders; depression; psychosis; mother–child interaction; Postpartum Bonding Questionnaire (PBQ).

Introduction

Women in the puerperium are susceptible to the whole spectrum of general psychiatric disorders. The symptomatology, course and outcome of postpartum psychiatric disorders do not differ from such disorders occurring outside the perinatal period (Brockington, 2004; Riecher-Rössler & Hofecker-Fallahpour, 2003). Nevertheless it is typical for postpartum psychiatric disorders that the rela-

tionship to the newborn child features prominently and is reflected in the different symptoms. The mother's own perception of her emotional relationship to her child – the bond – and the behaviour between mother and child – the interaction – are two aspects of the mother–child relationship which are frequently affected by these psychiatric disorders. Using objective methods of research (such as video-supported observation scales), disturbances of mother–infant interaction in the case of postpartum depression have been well documented (Gunning et al, 2004; Weinberg & Tronick, 1998; Murray & Cooper, 1997; Field et al, 1990; Laucht et al, 2002). The behaviour of depressive mothers towards their infants was often described as passive, unresponsive or intrusive: they showed less emotional involvement or interest in the interaction with the infant and expressed more negative feelings or antagonism (overview, Reck et al, 2004). With psychotic women, similar but mostly more marked disturbances of mother–child interaction could be demonstrated (Riordan et al, 1999; Snellen et al, 1999). Accessing the emotional dimension of the mother–child relationship is only possible by exploring the self-perception of feelings. An instrument used for the standardized assessment of the self-perceived bond is the Postpartum Bonding Questionnaire (PBQ), whose specificity and sensitivity in identifying mother to child bonding disorders in both depressive and normal mothers is highly regarded (Brockington et al, 2001). To our knowledge no comparable instrument is available for psychotic women. Since the self-perceived bond in

the mother–child relationship of psychotic women is, in our clinical experience, an equally important aspect, we have employed the PBQ in this patient group in order to study this aspect.

In this paper, we present data on the maternal bond with the child and on the observed interactional behaviour in depressed and psychotic mothers. In addition, the relationship between self-perceived bonding and interaction is investigated and its clinical relevance discussed.

Materials and methods

Participants/sample

Patients of the mother–baby unit at the department of psychiatry and psychotherapy in Wiesloch, Germany participated in an ongoing longitudinal therapy study of mothers with postpartum psychiatric disorders. The sample consists of mothers and their babies who were admitted to the hospital between May 2003 and September 2005 and fulfilled the study criteria (postpartum disorder, child 0–24-month old, subjective or objective deficits of maternal competencies (screened by video-based observations)).

The current study includes 35 mothers with severe postpartum mental disorders (18 depressive, 17 psychotic) whose children were at 0 to 7 months old and for whom the relevant data were complete. The study was approved by the ethics committee of the Landesärztekammer Baden-Wuerttemberg (Baden-Wuerttemberg's General Medical Council) and all participants gave their written informed consent.

Measures

Demographic, obstetric, child and psychopathological data

A standardized interview was used during the first week after admission to assess age, family status, education, gravidity as well as child data in addition to the psychiatric basis documentation. To gain detailed psychopathological information and to provide evidence of significant impairment of social or occupational functioning, the attending physician ascertained the Clinical Global Impression scale (CGI) (National Institute of Mental Health 1970) and the Social and Occupational Functioning Assessment Scale according to DSM-IV-TR (SOFAS) (Startup et al, 2002), also additionally to the basis documentation. The CGI is scored 1 to 7 (not ill to very severely ill) and the SOFAS is a 0 to 100-point scale. Detailed diagnostic information was established by using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID I) German version (Wittchen et al, 1997) by an independent clinical psychologist, and led to DSM as well as ICD-10 diagnoses. The Positive and Negative Syndrome Scale (PANSS) (Kay et al, 1987) is a 30-item, seven-point rating instrument to assess the clinical state of schizophrenia and we used the subscales for positive and for negative symptoms. To ascertain the severity of depression we applied the 21-version of the Hamilton Depression Scale (HAMD-21; Hamilton, 1960, 1967).

Subjective experience of bonding to the child

The Postpartum Bonding Questionnaire (PBQ) (Brockington et al, 2001) was used to measure a mother's self-perceived bonding to her child during the first week of admission. The PBQ covers 25 items, rated on a 0 to 5 point scale, and four subscales. Scale 1 *Impaired bonding* consists of 12 items, the cut-off point is 11 and describes a general factor; Scale 2 *Rejection and anger* comprises seven items, the cut-off point is 16; Scale 3 "*Anxiety about care*" is composed of four items, cut-off point is 9 and Scale 4 *Risk of abuse* covers two items with a cut-off point of 2. The sum of scores as well as dichotomous variables below and above the cut off point for each subscale were calculated. Due to the fact that *Risk of abuse* is not associated with any form of bonding disorders (Brockington et al, 2001) we excluded scale 4 from further analyses.

Objective measurement of mother–child interaction

An observational procedure was used to objectively assess the quality of mother–child interaction. Mothers and infants completed a 10-minute standardized nursing and playing situation at our video laboratory. With the aid of a split screen technique both mother and child could be seen simultaneously. The categorical system for micro-analysis of the early mother–child interaction (Jörg et al, 1994) was used to assess different aspects of mother and child during the interaction. For this study an event-based coding system of maternal responsiveness and interactive behaviours was applied to these videotapes. Coding was conducted by a trained rater, who was blind as to maternal psychopathology. Maternal responsiveness was rated at 5-second intervals and comprised all behaviour executed as a response to the infant behaviour (vocal, facial or motor responsiveness) as well as a lack of responsiveness (no response, although a response or an action was expected). Interactive behaviour assessed at 30-second intervals focused on the mother's style of interaction and on the manner in which she provided appropriate stimulation, guidance and control to the child in the interaction. At every interval a behaviour was rated as either present or absent. Thus, more than one behaviour could be coded at the same interval, but no behaviour category was scored more than once for a given interval.

Data analysis

Bivariate analyses (chi-square for categorical variables and *t*-tests for continuous variables) were conducted to examine differences between the diagnostic groups.

To determine the association between the subjective experience of bonding to the child and the objective assessed mother–child interaction, spearman-rho correlations were used.

Results

Demographics

Demographic and clinical characteristics for depressive and psychotic mothers and their children are presented

Table 1. Social demography and psychopathology of the mothers: group differences

	Depressive mothers (<i>N</i> = 18)		Psychotic mothers (<i>N</i> = 17)		Group difference	
	Mean (SD) <i>N</i> (%)	Range	Mean (SD) <i>N</i> (%)	Range	T-/Chi ²	<i>P</i> -value
<i>Social demography</i>						
Age (years)	34.78 (4.89)	25–44	32.47 (6.52)	22–43	1.188	0.243
Family status					3.646	0.162
single	1 (5.6)		4 (23.5)			
partner	17 (94.4)		12 (70.6)			
others	0 (0)		1 (5.9)			
Education/qualifications					3.003	0.391
Grammar school	7 (38.9)		3 (17.6)			
Secondary school (intermediate)	7 (38.9)		10 (58.8)			
Secondary school (basic)	4 (22.2)		4 (23.5)			
No qualifications	–		–			
Parity primiparous	7 (38.9)		6 (35.3)		0.048	0.826
Number of children	1.61 (0.92)	1–4	1.47 (0.80)	1–4	0.482	0.633
<i>Child data (indexchild)</i>						
Gender (%) male	8 (44.4)		9 (52.9)		0.253	0.615
Age (months)	2.56 (2.08)	0–7	2.77 (2.56)	0–8	–0.266	0.792
<i>Psychopathology mother</i>						
Age at onset of psychiatric disorder	29.39 (5.51)	16–38	26.65 (7.14)	15–43	1.276	0.211
Previous hospitalization	0.67 (0.91)	0–3	1.59 (1.12)	0–4	–2.680	0.011
Ever suicide attempt	2 (11.8)		1 (6.3)		0.303	0.582
Clinical Global Impression Scale (CGI)	4.56 (0.92)	2–6	4.82 (1.13)	3–6	–0.770	0.447
Social and Occupational Functioning Assessment Scale (SOFAS)	53.72 (8.39)	40–70	46.82 (12.64)	30–65	1.891	0.069
HAMD-21	14.06 (5.92)	2–23	–	–	–	–
PANSS Negative Syndrome Scale	–	–	22.59 (9.67)	10–43	–	–
PANSS Positive Syndrome Scale	–	–	17.71 (10.87)	7–42	–	–

in Table 1. Results indicated that groups did not significantly differ regarding age, family status, education, parity and number of children in the family. In addition, no significant differences relating to the child data were observed.

Psychopathology

The two groups did not significantly differ in the Clinical Global Impression Scale (CGI), age of the onset of psychiatric disorder or in the number of suicide attempts. However, the psychotic mothers had previously been treated in psychiatric hospitals more often than depressive mothers and their Social and Occupational Functioning score (SOFAS) tended to be lower (Table 1).

Subjective experience of bonding (PBQ)

Significant differences were found between depressive and psychotic mothers' ratings on the scales *Impaired bonding* and *Rejection and anger*. A clear trend was seen

in the values of the scale *anxiety about care*. Depressive mothers' ratings on these three scores were higher than the ratings of psychotic mothers. In these scales a significantly larger number of depressive mothers (61.1 vs. 29.4%, 11.1 vs. 0% and 38.9 vs. 5.9%) scored above the recommended cut-off (11, 16, and 9 points respectively) and, according to the definition of Brockington, mainly the mothers above cut-off points of the first and second scale showed a bonding disorder (Table 2).

Objective measurement of mother-child interaction (MCI)

Table 2 shows that the maternal behaviour patterns in the interaction with the infant (responsiveness as well as the style of the interaction) did not substantially differ between depressive and psychotic mothers. The only significant difference in the mother-child interaction was observed not with the mothers but with the children of psychotic mothers: they showed significantly more avoidance of eye contact than children of depressive mothers.

Table 2. Subjective and objective measures of bonding experiences and the mother-child interaction

	Depressive mothers (N = 18)					Psychotic mothers (N = 17)					Group difference			
	Mean	SD	Median	Min.	Max.	>Cut off N (%)	Mean	SD	Median	Min.	Max.	>Cut off N (%)	F	P-value
PBQ														
Impaired Bonding	17.94	12.28	17.50	3	45	11 (61.1)	8.74	7.65	7.00	0	27	5 (29.4)	6.980	0.013
Rejection and anger	10.20	6.68	10.00	0	26	2 (11.1)	5.03	3.97	3.00	0	15	0 (0)	7.613	0.009
Anxiety about care	7.61	4.74	8.50	0	17	7 (38.9)	4.65	4.30	5.00	0	18	1 (5.9)	3.738	0.062
Risk of abuse	0.39	1.42	0.00	0	6	1 (5.6)	0.35	1.06	0.00	0	4	1 (5.9)	0.007	0.933
MCI														
Vocal responsiveness	3861.11	1653.26	3812.50	750	7500	-	3139.71	1633.92	3000.00	1125	6500	-	1.684	0.203
Motor responsiveness	2236.11	1431.58	1937.50	250	5625	-	2470.59	1590.09	2000.00	625	6500	-	0.211	0.649
Facial responsiveness	1729.17	1358.02	1625.00	0	5125	-	1213.24	1414.05	625.00	0	5250	-	1.212	0.279
Lack of responsiveness	4340.28	3245.70	3312.50	375	14000	-	5073.53	2489.85	4875.00	1500	9875	-	0.557	0.461
Child avoidance	1301.47	2920.18	375.00	0	11750	-	4408.33	3272.40	4625.00	250	9750	-	8.058	0.008
of eye contact														
Pejorative to the child	1833.33	2712.99	375.00	0	8250	-	1058.82	1524.61	0	0	4500	-	1.066	0.309
Impatience	291.67	733.90	0	0	2250	-	308.82	958.23	0	0	3750	-	0.004	0.953
Overstimulation	1625.00	1749.48	1500.00	0	6000	-	794.12	1788.06	0	0	6000	-	1.930	0.174
Cuddling the child	873.06	861.85	577.00	0	3541	-	1223.00	1468.69	793.00	0	6198	-	0.750	0.393
Abrupt interruption of stimulation	291.67	637.377	0	0	2250	-	485.29	792.89	0	0	3000	-	0.638	0.430
Positive child's response to mother's play	369.60	561.90	116.00	0	1802	-	159.73	181.69	103.00	0	670	-	1.894	0.180
Positive child's response to mother's vocalisation	229.20	301.06	168.00	0	1187	-	130.47	161.94	12.00	0	461	-	1.251	0.273
Positive child's response to mother's smile	261.60	265.29	276.00	0	923	-	145.80	214.81	41.00	0	631	-	1.727	0.199

Table 3. Association between PBQ and MCI (spearman-rho correlations) by depressive and psychotic mothers

	Depressive mothers (<i>N</i> = 18)			Psychotic mothers (<i>N</i> = 17)		
	Impaired bonding	Rejection and anger	Anxiety about care	Impaired bonding	Rejection and anger	Anxiety about care
Vocal responsiveness	−0.040	−0.246	−0.061	0.081	−0.182	0.163
Motor responsiveness	0.121	−0.002	−0.037	−0.383	−0.485*	−0.364
Facial responsiveness	−0.097	−0.246	−0.266	−0.066	−0.153	−0.200
Lack of responsiveness	0.391	0.474*	0.479*	−0.068	−0.049	0.294
Child avoidance of eye contact	0.354	0.477 ⁺	0.279	−0.259	0.026	−0.115
Pejorative to the child	0.473*	0.455 ⁺	0.532*	−0.217	0.277	0.009
Impatience	0.335	0.400	0.326	−0.307	0.043	−0.166
Overstimulation	0.041	−0.041	−0.040	−0.573*	−0.130	−0.521*
Cuddling the child	0.027	−0.019	−0.077	0.032	−0.041	0.185
Abrupt interruption of stimulation	0.412 ⁺	0.507*	0.426 ⁺	−0.323	−0.123	−0.411
Positive child's response to mother's play	0.287	0.013	0.319	0.086	−0.097	0.025
Positive child's response to mother's vocalisation	0.081	−0.074	0.177	0.248	−0.046	0.100
Positive child's response to mother's smile	−0.038	−0.186	0.053	0.176	−0.090	−0.033

⁺ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Association between subjective experience of bonding and objective measurement of mother–child interaction

With depressive mothers a significant association between the self-perceived bonding quality and the observation of pejorative expressions toward the child during the videotaped interaction was found: mothers who scored high on the global scale *Impaired bonding* were often pejorative to their babies. Besides that, they showed the tendency to interrupt a stimulating play in an abrupt way. Depressive mothers with high ratings on the scale *Rejection and anger* did not notice clear signals of their infants or did not react to these signals. There is also a significant association between this scale and the abrupt interruption of the stimulation. Depressive mothers who reported rejection and anger at their babies tended to be pejorative to the child. On the other hand, the children of these mothers showed a tendency to avoid eye contact with them. Finally, *Anxiety about care* was associated with maternal lack of responsiveness and pejorative expressions to the child and a tendency to the abrupt interruption of stimulation was clearly seen.

The results obtained for the group of psychotic mothers revealed only negative associations: mothers who scored low in the scales of the PBQ, indicating a non impaired bonding to the child, showed more overstimulation and more motor responsiveness.

Discussion

There were no significant differences in the social demographic data of the participants selected for this study. It is however noteworthy that the vast majority of the mentally ill mothers (between 70 and 90% of both diagnostic

groups) had a partner. Depressive and psychotic mothers were equally severely impaired by their illness and in their social competency, although there were indications amongst the psychotic mothers of a more difficult medical history (e.g. number of hospital stays). It is in our view all the more significant that the depressive mothers' experience of bonding is in stark contrast to that of psychotic mothers. Only depressive mothers attained very significant results on the global scale *Impaired Bonding*, whilst psychotic mothers felt a good bond towards their children. These intergroup differences in the bonding experience are in our view an expression of the psychopathology: feelings of inadequacy, negative cognitions and self-doubt influence the bonding experience of depressive mothers. Psychotic mothers do not appear impaired in their bonding to the child by such cognition. This may be the result of psychotic mothers' lower introspective ability and, additionally, of their efforts to conform. Psychotic mothers live in constant fear of losing custody of their child. Depressive mothers, on the other hand, often express a wish to be rid of their child, for example wanting to give the child up for adoption. Such wishes arise from the lack of bonding caused by the depressive symptomatology (Hornstein et al, in press).

In clinical practice with postpartum mentally ill women the contrast between subjective and objective parameters of the mother–child relationship is important. In the objective assessment of the mother–child interaction we found no differences between depressive and psychotic women in maternal interactive behaviour: in both patient groups responsiveness was clearly impaired, as were other aspects of interactive behaviour (e.g. patience, stimulation, etc.). This finding differs from the

results of an earlier comparable study (Riordan et al, 1999), where the interactive behaviour of psychotic mothers was more severely impaired. Non-specific general symptoms of affect, drive and psychomotor activity – in psychotic patients often associated with the negative syndrome – seemed to influence the interactive behaviour of our psychotic patients more than the symptoms typical of the diagnosis, particularly considering that most of the psychotic mothers were still suffering from positive symptoms (according to PANSS) at the time of admission. This view is confirmed by the study by Snellen (1999). All the more remarkable is the difference in interactive behaviour of the children, whose noticeable avoidance of eye contact with their psychotic mothers differed very significantly from that of the children of depressive mothers. The avoidance of eye contact in children of depressive mothers has been described in the literature as self-regulation behaviour in the interaction with the mother (Tronick & Gianino, 1986). This striving for self-regulation is, according to our results, particularly strongly pronounced in the children of psychotic mothers. As the maternal interaction patterns in both groups did not differ, however, this more strongly pronounced attempt at self-regulation could be a sign of greater vulnerability to stress in the children of psychotic mothers.

In both patient groups there was a connection between the self-perceived bond and the observed behaviour in interaction with the child. The weaker bond of the depressive mothers led in their dealings with the child to a lack of reactivity, pejorative behaviour towards the child and breaking off of stimulation, whilst over-stimulation and increased motor responsiveness reflected the efforts of the schizophrenic mothers who felt well bonded to their child.

Our findings show that subjective and objective aspects of motherhood are closely linked to one another. The PBQ works well for assessing subjective aspects with both depressive and psychotic patients. According to our results, this enables conclusions to be drawn about the behaviour of a mother, although in doing so only the current state of relationship aspects of the mother-child dyad are included. In our clinical experience, information gleaned from the PBQ alone is limited to be used to form conclusions as to the prospective parenting abilities of mentally ill mothers.

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Correspondence: Christiane Hornstein, MD, Mother Baby Unit (ward 43), Department of General Psychiatry and Psychotherapy, Psychiatric Centre Nordbaden, Heidelberger Str.1, 69168 Wiesloch, Germany; e-mail: christiane.hornstein@pzn-wiesloch.de