Family and Partner Psychopathology and the Risk of Postpartum Mental Disorders

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Objective: Family and partner psychopathology characterizes 2 different types of potential risk factors for mental disorders linked to both biological and psychosocial processes, and no studies have included both variables in a study of risk of postpartum mental disorders (PPMD). The aim was to assess how a history of mental disorders in either a first-degree family member or partner affects the risk of admission or outpatient contact with PPMD.

Method: A population-based cohort study using Danish registers was conducted, and survival analyses were performed. A total of 1,188,822 men and women became first-time parents during the study period from 1973 to 2005. The main outcome measure was incident admission or outpatient contact for any mental disorder (according to ICD-8 or ICD-10 criteria) 0 to 12 months after the birth of a first live-born child.

Results: A total of 2174 mothers and 1175 fathers experienced an incident admission or outpatient contact during the 12 months after the birth of the child. Mothers with no family or partner psychopathology had an increased risk of admission/outpatient contact 0 to 30 days postpartum; relative risk (RR) = 3.49 (95% CI = 3.01 to 4.04) compared to the reference group. During the same period, mothers with observed psychopathology in relatives and/or partners were at higher risk of PPMD: for family psychopathology, RR = 6.47 (95% CI = 5.25 to 7.97); for partner psychopathology, RR = 6.86 (95% CI = 3.95 to 11.90); and for both family and partner psychopathology, RR = 10.94 (95% CI = 5.18 to 23.09). Additionally, a 24-fold increased risk of PPMD 0 to 30 days postpartum was found in women with a first-degree relative with bipolar affective disorder compared to the reference group.

Conclusion: Results indicated that family psychopathology represents a particular risk in the immediate postpartum period, especially if a family member suffers from bipolar affective disorder compared to other diagnostic groups. However, additional studies are needed to establish if partner psychopathology is a risk factor for PPMD specifically or has a more general influence on risk of mental disorders throughout pregnancy and postpartum.

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Ms. Munk-Olsen initiated the study and had primary responsibility for it. All authors participated in conception and design of the study, Dr. Laursen analyzed the data, and all authors discussed and interpreted the results. Ms. Munk-Olsen wrote the drafts, and all authors participated in revising the manuscript for important intellectual content. Furthermore, all authors gave their final approval to the manuscript to be published. Ms. Munk-Olsen and Dr. Laursen had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

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There is a well-established risk of postpartum mental disorders (PPMD) among mothers during the first 3 months after childbirth, with 1 out of 1000 women being admitted (first-time admissions).[1] Recently, Harlow et al.[2] showed that mothers diagnosed with mental disorders prior to childbirth were at an increased risk of admission during the postpartum period, compared to women with no previous records of mental disorders. Neither study, however, considered the effect of family history of mental disorders, which is a well-known risk factor for mental disorders in general.[3,4] The role of family history in relation to PPMD has until recently not been fully established, since results have been divergent.[5–7] A high rate of co-occurrence of mental disorders in family members was, however, found in a study on puerperal disorders,[8] and it has been suggested that puerperal psychosis is a more familial subtype of bipolar affective disorders.[9]

In a previous population-based study, we found that fatherhood was not a risk factor for severe mental disorders in men.[1] However, new fathers have been found to be at increased risk of a mental disorder if the mother of the baby suffers from postnatal depression,[10] but the

potential influence of partner psychopathology on the risk of PPMD has not been established fully.

Family and partner psychopathology characterizes 2 different types of potential risk factors linked to both biological and psychosocial processes, since a family history of mental disorders represents a genetic predisposition and shared environment. Partner psychopathology also represents shared environmental factors in couples, but could furthermore indicate lack of emotional and social support from the partner who is unwell or suggest assortative mating in the couple. No studies have included both family and partner psychopathology in a study of risk of onset of PPMD in both men and women.

Consequently, the aim of this study was to assess whether history of mental disorders necessitating admission or outpatient contact in either a first-degree family member or partner affects the risk of admission with PPMD 0 to 12 months after the birth of a first live-born child and whether the risk differs between mothers and fathers.

METHOD

Study Population

We used data from the Danish Civil Registration System (CRS)[11] to obtain a large and representative set of data on Danish persons, a procedure similar to that used in a study published previously.[1] The register was established in 1968, when all people living in Denmark were recorded. It includes information on CRS-number, sex, date of birth, continuously updated information on vital status, and CRS-number of parents. The CRS-number is used as a personal identifier in all national registers, enabling accurate linkage between registers. Our study population included all persons born in Denmark January 1, 1955, to July 1, 1990, who were alive at their 15th birthday and had a link to their mothers in the register (N =2,290,217). The study was approved by the Danish Data Protection Agency.

Mental Disorders in Cohortees and First-Degree Family Members and Partners

The study population and their parents, siblings, and partners were linked with the Danish Psychiatric Central Register. This register contains data on all admissions to Danish psychiatric inpatient facilities. From 1995 onward, information on outpatient visits to psychiatric departments was also included in the register. The diagnostic system used from 1969 to 1993 was the Danish modification of the *International Classification of Diseases*, Eighth Revision (ICD-8),[12] and from 1994, the *International Classification of Diseases*, Tenth Revision (ICD-10).[13] Time of onset was defined as the date of the first admission or first outpatient contact at a psychiatric hospital. Among first-degree relatives (father, mother, sister, or brother of the proband) and partners (the other parent of the child), we combined information on first admissions or first outpatient contacts at a psychiatric hospital as measures of family and partner psychopathology. In addition, first-degree relatives' diagnoses were assessed using the following diagnostic groups: schizophrenia, schizotypal, and delusional disorders (ICD-8: 295.XX, 297.XX, 298.39, 301.83; ICD-10: F20–F29); unipolar depressive disorders (ICD-8: 296.09, 269.29, 296.89, 296.99, 298.09, 300.49, 301.1; ICD-10: F32, F33, F34.1, F38.8, F39.0); bipolar affective disorders (ICD-8: 296.19, 296.39, 298.19; ICD-10: F30, F31, F34.0, F38.0); adjustment disorders (ICD-8: 307, 308.4; ICD-10: F43); and a group of remaining diagnoses in ICD-8 and ICD-10.

Study Design

A total of 2,290,217 cohortees were followed from their 15th birthday or January 1, 1973, whichever came later, until date of incident onset for each disorder, 12 months after birth, date of death, date of emigration from Denmark, birth of child away from Denmark, or July 1, 2005, whichever came first. Time since birth was treated as a time-dependent variable measuring the pregnancy period and days and months after birth of first live-born child (singletons only). The variable was categorized as a pregnancy period 270 to 0 days before birth and 0 to 30 completed days, 31 to 60 completed days, 2 to 5 completed months, and 6 to 11 completed months after childbirth. For analyses of time since birth, we considered the period from birth to 12 months after the birth, to death of first child, or to birth of second child, whichever came first.

Statistical Analysis

Our study was designed as a cohort study, and a survival analysis was conducted using log-linear Poisson regression,[14] with the logarithm of the person-years as offset variable in the SAS GENMOD version 9.1 procedures (SAS Institute Inc.; Cary, N.C.). This method approximates a Cox regression when analyzing large datasets.[14,15] Cumulative incidences were also calculated.[16]

The main outcome measures were relative risks adjusted for age (1-year groups) and calendar period (1-year groups), and stratified analyses were performed for each sex. Age; calendar period; history of mental disorder in parent, sibling, or partner; parenthood; and time since birth were treated as time-dependent variables.

RESULTS

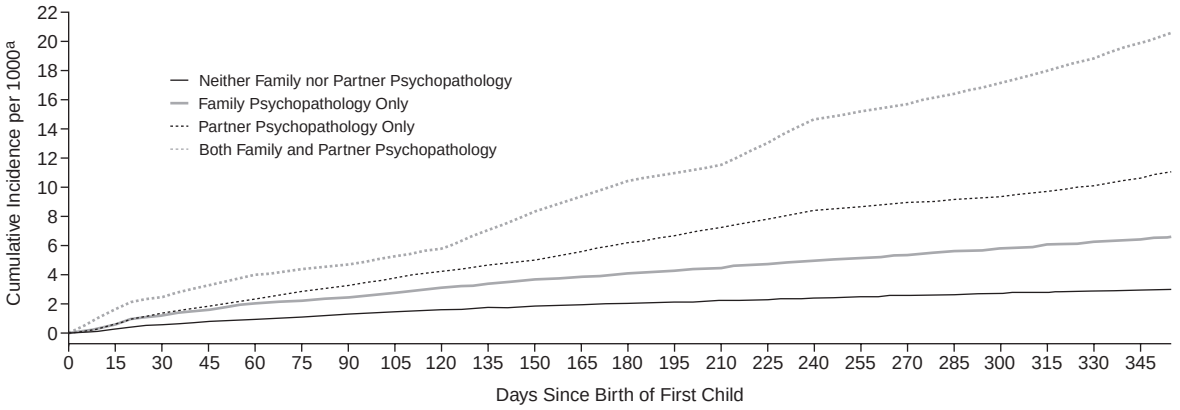
A total of 624,292 women and 564,530 men became parents for the first time during the study period from 1973 to 2005, and 2174 primiparous mothers and 1175 fathers experienced an incident admission or outpatient contact during the 12 months after the birth of their first live-born child. Of these, 34% of the mothers (N = 729) and

Table 1. Family and Partner Psychopathology and Risk of Postpartum Mental Disorders in First-Time Mothers[a]

	Neither Family nor Partner Psychopathology		Family Psychopathology Only		Partner Psychopathology Only		Both Family and Partner Psychopathology	
Time Point	No. of Cases	Relative Risk (95% CI)	No. of Cases	Relative Risk (95% CI)	No. of Cases	Relative Risk (95% CI)	No. of Cases	Relative Risk (95% CI)
Pregnancy	566	0.72 (0.63 to 0.81)	251	1.60 (1.37 to 1.86)	54	3.05 (2.30 to 4.04)	33	5.70 (4.00 to 8.12)
0–30 d postpartum	288	3.49 (3.01 to 4.04)	108	6.47 (5.25 to 7.97)	13	6.86 (3.95 to 11.90)	7	10.94 (5.18 to 23.09)
31–60 d postpartum	197	2.40 (2.03 to 2.83)	64	3.84 (2.96 to 4.99)	10	5.28 (2.82 to 9.88)	4	6.26 (2.34 to 16.76)
2–5 mo postpartum	482	1.48 (1.31 to 1.68)	173	2.61 (2.19 to 3.10)	36	4.76 (3.39 to 6.68)	18	7.03 (4.39 to 11.27)
6–11 mo postpartum	478	1 (reference group)	213	2.16 (1.83 to 2.54)	53	4.67 (3.52 to 6.21)	30	7.69 (5.31 to 11.13)

[a]Adjusted for calendar time, age, and whether grandfather of child is unknown in the register. Diagnoses from admissions and outpatient contacts are combined into 1 measure of postpartum mental disorders and family/partner psychopathology.

Figure 1. Cumulative Incidence of Postpartum Mental Disorders in First-Time Mothers According to Mental Disorder in First-Degree Relatives or Partner



[a]The cumulative incidence measures the percentage of women in the population who had developed postpartum mental disorders at a given time after childbirth. Diagnoses from admissions and outpatient contacts are combined into 1 measure of postpartum mental disorders and family/partner psychopathology.

42% of the fathers (N = 493) had a family member, a partner, or both who had been admitted to a psychiatric hospital or had outpatient contacts prior to birth of the child.

Table 1 shows the association between time since childbirth and family and/or partner psychopathology on the risk of PPMD in mothers. New mothers with no records of family or partner psychopathology who gave birth 6 to 11 months prior were chosen as the reference group. Irrespective of psychopathology in relatives or partner, all mothers had the highest risk of onset of PPMD 0 to 30 days postpartum. Also irrespective of time since childbirth, new mothers with observed family and/or partner psychopathology had a larger risk of mental disorders compared with new mothers without such a history, and the observed excess risk was present during both pregnancy and the first year after childbirth. The highest risk of PPMD was observed in new mothers with both a first-degree relative and a partner previously diagnosed with a mental disorder 0 to 30 days postpartum compared to the reference group; relative risk (RR) = 10.94 (95% CI = 5.18 to 23.09, Table 1).

For women with no family or partner psychopathology and women with family psychopathology only, the period 0 to 30 days postpartum represented a specific time with a statistically significantly increased risk of PPMD; RR = 3.49 (3.01 to 4.04) and RR = 6.47 (5.25 to 7.97), respectively, compared to the pregnancy period and 31 to 60 days postpartum (Table 1).

Cumulative incidences of admissions or outpatient contacts from PPMD varied according to family and partner psychopathology. Among mothers with no observed psychopathology in relatives or partner, 1.66 out of 1000 were admitted or had outpatient contacts during the first 3 completed months postpartum (120 days after childbirth), whereas the cumulative incidences in mothers with observed psychopathology in close relatives were 3.22 per 1000 mothers with family psychopathology, 4.28 per 1000 mothers with partner psychopathology, and 5.82 per 1000 mothers with both family and partner psychopathology (Figure 1).

Additional analyses were performed to examine whether the timing of the partner's admission affected the risk of PPMD. As expected, the mother's risk of PPMD

Table 2. Diagnosis of Specific Mental Disorders in First-Degree Relatives and Risk of Any Postpartum Mental Disorder in New Mothers[a]

	No Mental Disorders in First-Degree Relatives			Schizophrenia, Schizophrenia-Like, and Schizotypal Disorders in First-Degree Relatives			Unipolar Depressive Disorders in First-Degree Relatives		
Time Point	No. of Cases	Rate	Relative Risk (95% CI)	No. of Cases	Rate	Relative Risk (95% CI)	No. of Cases	Rate	Relative Risk (95% CI)
Pregnancy	620	1.62	0.70 (0.63 to 0.79)	36	4.40	1.59 (1.14 to 2.24)	88	4.64	1.87 (1.49 to 2.34)
0–30 d postpartum	301	7.51	3.28 (2.84 to 3.78)	20	22.92	8.34 (5.34 to 13.04)	43	21.22	8.55 (6.27 to 11.67)
31–60 d postpartum	207	5.19	2.27 (1.93 to 2.66)	12	13.77	5.01 (2.83 to 8.88)	26	12.85	5.18 (3.49 to 7.68)
2–5 mo postpartum	518	3.28	1.43 (1.27 to 1.62)	33	9.46	3.44 (2.42 to 4.89)	60	7.42	2.99 (2.29 to 3.90)
6–11 mo postpartum	531	2.29	1 (reference group)	44	8.42	3.06 (2.25 to 4.17)	82	6.79	2.73 (2.16 to 3.45)

[a]Adjusted for age, calendar time, and whether grandfather of child is unknown in the register; first-degree relatives are father, mother, sister, or brother of the new mother. Diagnostic groups are not mutually exclusive. Diagnoses from admissions and outpatient contacts are combined into 1 measure of postpartum mental disorders and family/partner psychopathology.

Table 3. Family and Partner Psychopathology and Risk of Postpartum Mental Disorders in First-Time Fathers[a]

	Neither Family nor Partner Psychopathology		Family Psychopathology Only		Partner Psychopathology Only		Both Family and Partner Psychopathology	
Time Point	No. of Cases	Relative Risk (95% CI)	No. of Cases	Relative Risk (95% CI)	No. of Cases	Relative Risk (95% CI)	No. of Cases	Relative Risk (95% CI)
Pregnancy	368	0.57 (0.49 to 0.66)	196	1.55 (1.30 to 1.85)	59	2.77 (2.10 to 3.66)	38	5.92 (4.22 to 8.30)
0–30 d postpartum	39	0.59 (0.43 to 0.83)	23	1.76 (1.15 to 2.69)	7	3.19 (1.51 to 6.75)	5	7.42 (3.07 to 17.97)
31–60 d postpartum	42	0.65 (0.47 to 0.89)	26	2.02 (1.35 to 3.00)	11	5.03 (2.76 to 9.17)	2	2.97 (0.74 to 11.94)
2–5 mo postpartum	248	0.99 (0.84 to 1.17)	94	1.87 (1.49 to 2.34)	44	5.11 (3.73 to 7.01)	20	7.57 (4.82 to 11.90)
6–11 mo postpartum	353	1 (reference group)	174	2.41 (2.01 to 2.90)	62	5.06 (3.86 to 6.63)	25	6.64 (4.42 to 9.98)

[a]Adjusted for calendar time, age, and whether grandfather of child is unknown in the register. Diagnoses from admissions and outpatient contacts are combined into 1 measure of postpartum mental disorders and family/partner psychopathology.

increased the closer the partner's admission was to the birth of the child, especially if the partner had been admitted after becoming a father but prior to onset of the mother's mental disorder (results not shown).

Further diagnosis-specific analyses focusing on mental disorders in first-degree relatives were made (Table 2). In comparison to mothers with no observed family or partner psychopathology who gave birth 6 to 11 months prior (reference group), results indicated a highly increased risk of PPMD 0 to 30 days postpartum in mothers if a first-degree relative had suffered from bipolar affective disorders; RR = 24.03 (95% CI = 15.69 to 36.82). The relative risks during the same period for schizophrenia-like disorders (RR = 8.34, 95% CI = 5.34 to 13.04) and unipolar depressive disorders (RR = 8.55, 95% CI = 6.27 to 11.67) were very similar and considerably smaller than for bipolar affective disorders. In addition, these results did not differ significantly according to which first-degree relative (father, mother, sister, or brother) was previously diagnosed with a mental disorder.

Becoming a father did not increase the risk of severe mental disorder, regardless of the fathers' possible predisposition to a mental disorder. Men with no records of family or partner psychopathology who became fathers 6 to 11 months prior were chosen as the reference group. Different risks were observed, with an excess risk of admission according to psychopathology in family members and/or partner both during pregnancy and up to 1 year postpartum, similar to the pattern observed in new mothers, but without the specific increase in risk shortly after childbirth (Table 3).

DISCUSSION

Our study indicated that in mothers, family psychopathology influenced triggering of PPMD. Nonoverlapping confidence intervals for the relative risks indicated that there was a specific influence of family psychopathology during the first 30 days postpartum compared to the pregnancy period and the period 31 to 60 days postpartum, as opposed to the overlapping confidence intervals for partner psychopathology and combined family and partner psychopathology in the same period (Table 1). However, results regarding mothers with partner psychopathology only and both family and partner psychopathology 0 to 30 days postpartum were based on few cases (13 and 7, respectively). Whether partner psychopathology is a risk factor specifically for PPMD or has a more general effect on risk of onset of mental disorders during both pregnancy and postpartum could therefore not be established in the current study.

A meta-analysis by O'Hara and Swain[7] did not establish family history of mental disorder as a risk factor for postpartum mental disorder. However, more recent studies by Forty et al.[17] and Jones and Craddock[8] have documented an excess risk of mental disorders after

Bipolar Affective Disorders in First-Degree Relatives			Adjustment Disorders in First-Degree Relatives			Remaining Diagnoses in First-Degree Relatives		
No. of Cases	Rate	Relative Risk (95% CI)	No. of Cases	Rate	Relative Risk (95% CI)	No. of Cases	Rate	Relative Risk (95% CI)
15	4.57	1.75 (1.05 to 2.93)	98	6.73	2.18 (1.75 to 2.70)	120	3.88	1.41 (1.15 to 1.72)
22	62.82	24.03 (15.69 to 36.82)	26	16.63	5.42 (3.65 to 8.04)	40	12.08	4.41 (3.20 to 6.09)
7	20.01	7.66 (3.64 to 16.15)	10	6.41	2.09 (1.12 to 3.91)	29	8.77	3.21 (2.21 to 4.66)
8	5.74	2.20 (1.09 to 4.41)	53	8.50	2.78 (2.10 to 3.69)	88	6.68	2.45 (1.95 to 3.07)
14	6.72	2.57 (1.51 to 4.37)	68	7.29	2.40 (1.86 to 3.09)	99	5.03	1.85 (1.49 to 2.30)

childbirth in mothers previously diagnosed with bipolar affective or unipolar depressive disorders and, furthermore, a high rate of co-occurrence of mental disorder in family members in general. If the apparent link between family psychopathology and risk of severe PPMD is causal, it may be due to common shared environment between family members, genetic factors, or—more likely—a combination of both, as suggested by Forty et al.[17]

Couples' risk of the same disease has been studied by Hippisley-Cox et al.,[18] who found that women with a depressed partner had a 2-fold increased risk of being depressed themselves compared to women with no depressed partners. An observed co-occurrence of, for example, depression could be due to assortative mating, indicating that people are likely to choose partners similar to themselves. In our study, this would indicate that both parents are predisposed to mental disorders but also share the same environment. Moreover, partner psychopathology could be interpreted as a measure for lack of support from the partner with a mental disorder and could explain the excess risk of mental disorders we found in this study both during pregnancy and postpartum.

Results of the current study indicated that partner psychopathology and the combined measure of family and partner psychopathology are not specific risk factors for PPMD. This could be explained by at least 2 reasons: (1) that partner psychopathology has a more general influence on risk of mental disorders not specifically related to the time of childbirth and (2) overlapping confidence intervals indicated that there were too few cases in the specific groups, and as a consequence we could not establish whether partner psychopathology increases risk of PPMD. To do this would require further studies with more cases.

Table 2 showed the risk of PPMD to be approximately 3 times larger if the mother had a first-degree relative with bipolar affective disorder during the immediate postpartum period compared to both schizophrenia-like and unipolar affective disorders. This finding adds further to the evidence from both clinical and genetic studies of a close relationship between puerperal psychosis and bipolar affective disorder.[8,19]

Implications

A total of 729 mothers (34%) and 493 fathers (42%) with admission or outpatient contact during the 12 months after the birth of the child had a family member, a partner, or both who had been admitted to a psychiatric hospital or had outpatient contacts; similar results were found by Steiner.[20] This constitutes a large proportion of new mothers and fathers and implies that health professionals working with new parents should assess mental disorders in close relatives or partners. In our previous study, we found that, among mothers with no previous records of mental disorders having their first live-born child, around 1 per 1000 were admitted with PPMD 3 completed months after childbirth. Those results were not adjusted for family and partner psychopathology in the analyses. As shown in Figure 1, results from the present study showed an increase in incidence of admissions and outpatient contacts 3 completed months postpartum (120 days after childbirth) if a first-degree relative or the partner previously had been diagnosed with a mental disorder, with the highest observed cumulative incidence in mothers with both family and partner psychopathology: 5.82 per 1000 mothers.

First-time parents with no previous history of mental disorders were included in our study. In a recent study by Harlow et al.,[2] incidence of hospitalization for postpartum psychotic and bipolar disorders was assessed in women both with and without prior pregnancy or prenatal psychiatric hospitalizations. Results indicated that risk of hospitalization was especially high among women with histories of mental disorders, both prior to and during the pregnancy period, and the authors conclude that this underscores the need for, e.g., obstetricians to adequately determine prevalence of a history of severe psychiatric morbidity in expectant mothers. In addition, our results imply that mental disorders in partners and first-degree relatives of expecting mothers should also be assessed prior to childbirth.

Mental health of the mother is crucial for her to function optimally[21]; however, the mental health of family members and partners can influence the risks of a mental disorder during the postpartum period and should be considered if screening is implemented. Screening for postpartum depression was recently ratified in New Jersey (http://www.njleg.state.nj.us; accessed Feb. 5, 2007), and nationwide screening is being considered for the United States.[21]

An increased awareness of parents who have close relatives and/or partners with mental disorders could possibly relieve new parents and would ideally enable parents to increase the amount of support they provide for each other if given more help and attention during the postpartum period.[10] A greater understanding of the causes of postpartum mental disorders will facilitate advances in the prevention and treatment of the perinatal episodes, with obvious benefits to families affected by this.[17]

Strengths and Limitations

To our knowledge, this study is the first to take both family and partner psychopathology into account when focusing on risk of PPMD. It highlights the importance of assessing previous mental disorder in family members or partners of expectant mothers (first-time parents) with specific emphasis on family history of bipolar affective disorder. One of the difficulties in establishing family history of mental illness is that the patient needs to be aware of relatives with mental problems and be willing to disclose that information.[6] In a register-based, population-based study, however, this does not introduce reporting bias, since information on both family and partner psychopathology is retained from registers and not from the probands themselves.

Since no private psychiatric hospitals exist in Denmark, we are ensured that all cases are recorded in the Psychiatric Central Register. This results in true measures of incidence rate ratios on a population-based level with sufficient statistical power to also demonstrate findings on diagnosis-specific levels. The registers, however, only provide information on severe mental disorders resulting in admissions or outpatient contacts, and unfortunately we had no access to information on symptoms of, for example, postpartum depression not necessitating admission.

CONCLUSION

Mothers had an increased risk of PPMD in the first months after childbirth. Bipolar affective disorders in a first-degree relative particularly increased risk of onset of any mental disorder shortly after childbirth, and the relative risk was 3-fold higher than the observed risk associated with unipolar depression or schizophrenia-like disorders in a first-degree relative.

Results indicated that family psychopathology is a risk factor for PPMD that triggers onset of an incident mental disorder specifically during the first 30 days postpartum. Additional studies are needed to establish whether partner psychopathology is a risk factor for PPMD specifically or has a more general influence on risk of mental disorders throughout pregnancy and postpartum.

Becoming a father was not an independent risk factor of mental disorders, even in groups of fathers predisposed to mental disorders.

Any previous or current mental disorder and especially bipolar affective disorders in first-degree relatives, as well as mental disorders in partners, should be taken into account in the detection and management of severe PPMD in new mothers.

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