Functional Recovery After Postpartum Psychosis:
A Prospective Longitudinal Study

Karin M. Burgerhout, MD[a]; Astrid M. Kamperman, PhD[a]; Sabine J. Roza, MD, PhD[a]; Mijke P. Lambregtse-Van den Berg, MD, PhD[a,b]; Kathelijne M. Koorengevel, MD, PhD[a]; Witte J. G. Hoogendijk, MD, PhD[a]; Steven A. Kushner, MD, PhD[a]; and Veerle Bergink, MD, PhD[a,*]

ABSTRACT

Objective: Postpartum psychosis is an acute and severe mood disorder. Although the prognosis is generally good, postpartum psychosis is a highly stressful life-event presumed to have a major impact on functioning and well-being beyond the acute stage of the illness. We studied functional recovery, including psychosocial functioning and the presence of psychological distress, in patients with a recent diagnosis of postpartum psychosis.

Methods: Seventy-eight patients with postpartum psychosis consecutively admitted for inpatient hospitalization between 2005 and 2011 were assessed 9 months postpartum. Included were patients with *DSM-IV-TR* diagnoses of psychotic disorder not otherwise specified, brief psychotic disorder, or mood disorder with psychotic features, each requiring the additional specifier "with postpartum onset." Functioning was assessed in 4 domains by the Longitudinal Interval Follow-up Evaluation–Range of Impaired Functioning Tool (LIFE-RIFT). Symptomatology was measured by the Brief Symptom Inventory and compared to a matched population-based cohort.

Results: Nine months postpartum, 74% (58/78) of women with postpartum psychosis reported good functioning on the domains of work, interpersonal relations, recreation, and global satisfaction. Moreover, 88% (69/78) of patients with postpartum psychosis had resumed their premorbid employment and household responsibilities. Compared to the general population, patients with postpartum psychosis reported a higher burden of depression and anxiety (effect sizes $r \leq 0.14$). Patients who had a relapse episode (18%) experienced considerable functional impairments across several domains.

Conclusions: Nine months postpartum, the majority of patients with postpartum psychosis reported good functional recovery. Our relatively improved functional outcomes compared to nonpostpartum onset could be attributed to the postpartum onset and/or more favorable risk factor profile.

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[a]Departments of Psychiatry and [b]Child and Adolescent Psychiatry, Erasmus Medical Center, Rotterdam, the Netherlands

**Corresponding author:* Veerle Bergink, MD, PhD, Erasmus Medical Center, Department of Psychiatry, 's-Gravendijkwal 230, 3015 CE Rotterdam, the Netherlands (v.bergink@erasmusmc.nl).

The birth of a child is a major life event, leading to profound changes in many aspects of daily life, especially for primiparous mothers.[1,2] With an incidence of approximately 1:1,000 childbirths, postpartum psychosis manifests as the acute onset of severe affective psychotic symptoms within 4 to 6 weeks after delivery, often in women with no prior psychiatric history.[3,4] These symptoms of postpartum psychosis are very stressful for both the patient and her family and have a substantial impact on psychosocial functioning.

During the acute phase, patients frequently experience manic symptoms, severe depressive symptoms, and/or purely psychotic symptoms. Given the predominance of the affective symptoms, postpartum psychosis is generally considered an affective disorder and not a primary psychotic disorder. Symptomatology, family history data, and the longitudinal illness course all support the notion of a strong link to bipolar disorder.[5,6]

Episodes of postpartum psychosis are typically severe, but limited in time.[6,7] We previously described the complete remission of symptoms after a median episode of 40 days in 98% of patients receiving pharmacologic treatment.[8] Notably, the median duration of illness in postpartum psychosis is similar to the duration of manic episodes reported for bipolar patients.[9] Although the short-term prognosis for postpartum psychosis is very optimistic, following remission, most patients describe their acute episode as very stressful and even traumatic.[10,11] In addition, previous case series have revealed that patients often report feelings of guilt, anxiety, social vulnerability, and difficulties in their personal relationships.[10–12] A comprehensive, prospective, longitudinal study of functioning and quality of life has never previously been conducted for women with postpartum psychosis, but would, however, provide a necessary base of evidence for clinicians to inform patients about their long-term prognosis. The present study was designed to prospectively assess functional recovery 9 months postpartum in 78 consecutive patients requiring psychiatric hospitalization for postpartum psychosis.

METHODS

Patient Population

The medical ethics committee of the Erasmus Medical Centre, Rotterdam, the Netherlands, approved this study. All patients provided written informed consent for their participation. All patients admitted to the Mother-Baby Inpatient Unit (MBU) of the Department of Psychiatry in the Erasmus Medical Centre between August 2005 and June 2011 were screened for eligibility. The MBU is a 5-bed inpatient unit dedicated to the treatment of patients with severe psychopathology in the postpartum period. Diagnoses were obtained using the Structured Clinical Interview for *DSM-IV* Axis I Disorders, Patient Edition (SCID-I/P).[13] We included patients with mania or psychosis who had an onset within 6 weeks after delivery. Since "postpartum psychosis" is not described as a separate

Clinical Points

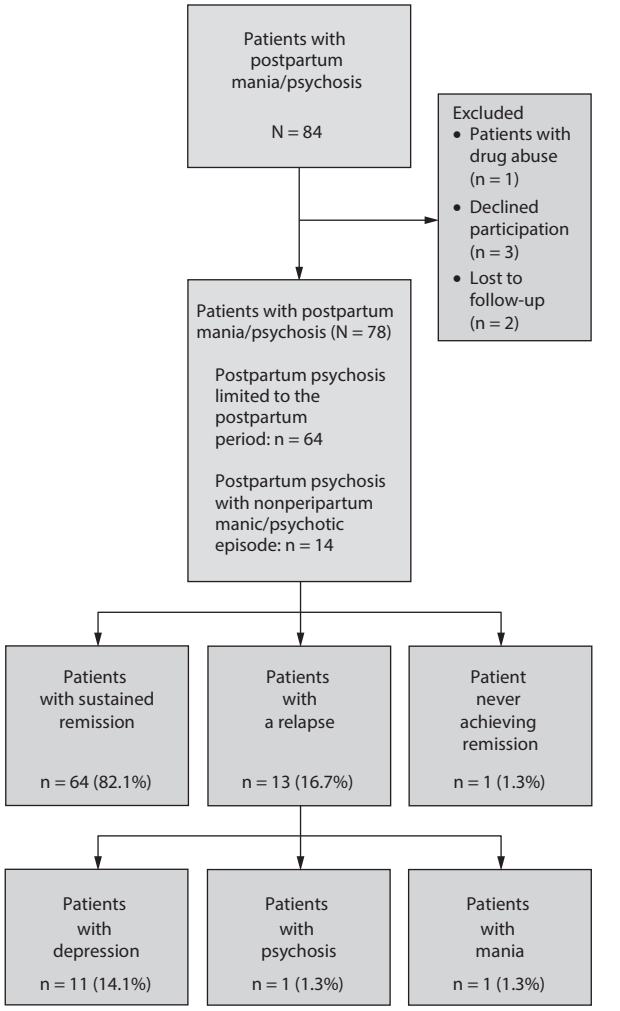
- Postpartum psychosis is an acute and severe mood disorder associated with substantial impairment in every aspect of daily life functioning during the acute episode. The prognosis is highly optimistic for achieving full clinical remission, but the impact on daily life functioning extends well beyond the acute stage of illness.
- Seventy-four percent of patients with postpartum psychosis reported good functional recovery, and 88.5% were able to resume their employment and household responsibilities within 9 months postpartum. Compared to a matched population-based cohort, patients with postpartum psychosis reported only slightly more symptoms of depression and anxiety.
- Eighteen percent of women experienced a relapse within 9 months postpartum, which resulted in considerable functional impairment and psychological distress.

disease entity, we operationally defined postpartum psychosis based upon any of the following *DSM-IV-TR* diagnoses: psychotic disorder not otherwise specified (NOS), brief psychotic disorder, or mood disorder (manic, mixed, or major depressive episode) with psychotic features, all requiring the specifier "with postpartum onset." Accordingly, patients with schizophrenia or schizoaffective disorder were excluded.

A total of 84 patients fulfilled the inclusion criteria for postpartum psychosis (Figure 1). Six patients were excluded from analysis: 1 patient was excluded due to cannabis dependence, 3 patients declined study participation, and 2 patients were lost to follow-up. In total, we included 78 patients with postpartum psychosis in the final analyses. Of these 78 patients, 14 had a history of nonperipartum psychosis (n = 4), mania (n = 9), or hypomania (n = 1).

In the remaining 64 patients, the psychotic or manic episode was limited to the postpartum period. Of these 64 patients, 54 were experiencing a first-onset psychotic or manic episode, while the remaining 10 had a prior history of postpartum psychosis.

Figure 1. Study Flowchart



Treatment

Patients diagnosed with psychosis or mania limited to the postpartum period (n = 64) were treated according to a structured treatment algorithm with sequential addition of a benzodiazepine, antipsychotic, and lithium as described previously.[8] *Remission* was defined as the absence of psychotic, manic, and severe depressive symptoms for at least 1 week as confirmed by Clinical Global Impressions Scale for use in bipolar illness (CGI-BP)[14] score ≤ 3, Young Mania Rating Scale (YMRS)[15] score ≤ 8, and Edinburgh Postnatal Depression Scale (EPDS)[16] score ≤ 10. After complete remission, benzodiazepines were slowly tapered to discontinuation under medical supervision. Patients who remitted on antipsychotic monotherapy were advised to continue this treatment as maintenance therapy. Conversely, patients who required both an antipsychotic and lithium to achieve remission were maintained on lithium monotherapy.

Of the 64 patients with postpartum psychosis limited to the postpartum period, 4 patients remitted with benzodiazepines only, 12 patients remitted during treatment with a combination of benzodiazepines and antipsychotics, and 47 patients remitted with a combination of benzodiazepines, antipsychotics, and lithium. One patient never achieved remission. Nine months postpartum, 16 patients had discontinued their medication. The remaining 48 patients continued maintenance monotherapy throughout the full 6-month postremission period, of which 8 patients were using antipsychotic monotherapy and 40 patients were using lithium monotherapy.

Of the 14 patients with a history of nonperipartum mania or psychosis, 9 patients were treated with the combination of benzodiazepines, antipsychotics, and lithium; 2 patients were treated with benzodiazepines and lithium; 2 patients were treated with antipsychotics and valproic acid; and 1 patient was treated with benzodiazepines and an antipsychotic. Nine months postpartum, 1 patient had discontinued her medication, 7 patients were maintained on lithium monotherapy, 2 patients were maintained on antipsychotic monotherapy, and 4 patients were using combination therapy

(antipsychotic and lithium, n = 2; antipsychotic and valproic acid, n = 2).

Assessments

Patients were evaluated weekly during inpatient hospitalization and at 9 months postpartum. The mean follow-up period was 8.7 months postpartum (SD = 7.5) and 6.1 months after remission (SD = 7.4). The 9-month postpartum evaluations were conducted in each patient's home and included assessments of relapse and functional recovery, including psychosocial functioning and psychological distress. The researcher (K.M.B.) met patients during the acute phase and invited them for the 9-month postpartum visit. Importantly, K.M.B. was not involved in the clinical care of the patients in this study.

Relapse

Relapse was defined as the occurrence of any psychiatric episode fulfilling *DSM-IV-TR* criteria and/or CGI-BP score > 3.[14] *Sustained remission* was defined as having never experienced a *DSM-IV-TR* mood or psychotic episode throughout the entire 9-month postpartum follow-up period, as well as maintaining a CGI-BP score ≤ 3. Longitudinal assessment of mood episodes was performed by the National Institute of Mental Health prospective life-charting methodology (NIMH-LCM-p).[17]

Functional Recovery: Psychosocial Functioning

Psychosocial functioning was investigated using the Longitudinal Interval Follow-up Evaluation–Range of Impaired Functioning Tool (LIFE-RIFT; see Supplementary Material at PSYCHIATRIST.COM).[18]

The LIFE-RIFT is an observer-rated instrument that assesses the level of functional impairment in the past week across 4 domains: work, interpersonal relations, global satisfaction, and recreation (see Supplementary Material).[18] Results are scored on a 5-point Likert scale, ranging from 1 to 5 (1: very good/no impairment, 2: good/satisfactory level, 3: fair/mild impairment, 4: poor/moderate impairment, 5: very poor/severe impairment).

For the subscale Work, the patients were asked to specify the degree to which their work (employment, household, or student) activities have been impaired as a result of psychopathology. Similarly, for the 3 subscales regarding Interpersonal Relations (spouse/children/other relatives), patients were asked to specify the degree to which their interpersonal relations have been impaired as a result of psychopathology. With regard to Satisfaction, patients were asked to rate their overall level of satisfaction. Finally, for the subscale Recreation, patients were asked at what level they have been involved in recreational activities and if they were able to enjoy these activities.[18]

LIFE-RIFT domain scores are summarized into a total psychosocial impairment score, ranging from 4 (no impairments) to 20 (impairments in all domains). The LIFE-RIFT composite score has been shown to have high reliability and validity in case-control cohort studies.[19] LIFE-RIFT total and subscale scores were analyzed as continuous and dichotomized variables. A dichotomous threshold score of 10 was defined for the total scale (score ≤ 10 indicates an overall good functioning in all domains), and a score of 2 was defined as the dichotomous threshold for each subscale (score ≤ 2 indicates minimal or no problems within a given domain).

Functional Recovery: Psychological Distress

Psychological distress was assessed using the Brief Symptom Inventory (BSI).[20] The BSI is a self-report questionnaire of 53 items validated for assessment of psychological well-being.[20] The BSI covers 9 psychological symptom dimensions divided into the following subscales: Interpersonal Sensitivity, Depression, Anxiety, Hostility, Somatization, Obsessive-Compulsive Traits, Phobic Anxiety, Paranoid Ideation, and Psychoticism.[20] Each item of the BSI is rated on a 5-point scale of distress, ranging from "not-at-all" (score of 0) to "extremely" (score of 4). The BSI demonstrates strong concordance with clinician symptom assessment and exhibits high test-retest and internal consistency reliabilities.[20]

Reference Population

Brief Symptom Inventory scores of women with postpartum psychosis were compared to a matched reference group who participated in the Generation R Study.[21] All pregnant women living in Rotterdam, the Netherlands, with an expected delivery date between April 2002 and January 2006 were invited to participate in the Generation R Study.

Subjects from the Generation R cohort were matched to our patient sample (ratio 4:1) based on age (5-year categories), ethnicity (Dutch native vs non-native), educational level (high school vs postsecondary education), and parity (primiparous vs multiparous), resulting in a reference sample of 318 women. Within the matched reference group, 4 BSI subscales were measured at 6 months postpartum: Interpersonal Sensitivity, Depression, Anxiety, and Hostility.

Statistical Analysis

We compared demographic and clinical characteristics between women with versus without impairments in daily functioning at 9 months postpartum. The following characteristics were handled as continuous variables in statistical analyses: age, duration of the postpartum psychosis episode (in days), and onset of postpartum psychosis symptoms (in days). Characteristics that were handled as dichotomous variables (yes/no) included Dutch ethnicity, education beyond high school, married or cohabitating, primiparity, psychiatric history (categories included no psychiatric history, previous postpartum psychosis, history of depression or anxiety, history of psychosis outside the peripartum period), phenomenology (categories included manic-psychotic features, depressive/mixed features, nonaffective psychosis), and psychotic symptoms (categories included mood incongruence and first-rank symptoms).

Next, we compared functioning (LIFE-RIFT scores) between women with sustained remission versus those who relapsed. Brief Symptom Inventory scores were compared

Table 1. Demographic and Clinical Characteristics of 78 Patients With Postpartum Psychosis and Comparison of Patients Without and With Impaired Functioning[a]

Characteristic	Postpartum Psychosis–All (N = 78)	No Impairment in Functioning (LIFE-RIFT total score ≤ 10) (n = 58)	Impaired Functioning (LIFE-RIFT total score ≥ 11) (n = 20)	*P* Value
General demographics				
Dutch ethnicity	70 (89.7)	53 (91.4)	17 (85.0)	.416
Education beyond high school	42 (53.8)	34 (58.6)	8 (40.0)	.196
Married or living with partner	76 (97.4)	58 (100.0)	18 (90.0)	.063
Primiparity	62 (79.5)	47 (81.0)	15 (75.0)	.537
Age, mean (SD), y	32.1 (5)	32.1 (5)	31.8 (4)	.591
Duration of postpartum psychosis, median (IQR), d	40.5 (26–57)	34.0 (23–55)	44.0 (40–115)	.015
Onset of postpartum psychosis, median (IQR), d	7 (5–14)	8 (5–15)	7 (4–13)	.192
Psychiatric history				
No psychiatric history	46 (59.0)	33 (56.9)	13 (65.0)	.604
Previous postpartum psychosis in history	10 (12.8)	8 (13.8)	2 (10.0)	1.000
Depression/anxiety in history	8 (10.3)	6 (10.3)	2 (10.0)	1.000
Nonpostpartum psychosis or (hypo)mania	14 (17.9)	11 (18.9)	3 (15.0)	1.000
Phenomenology–affective psychosis				
With manic-psychotic features	45 (57.7)	33 (56.9)	12 (60.0)	1.000
Depressed/mixed	28 (35.9)	21 (36.2)	7 (35.0)	1.000
Nonaffective psychosis	5 (6.4)	4 (6.9)	1 (5.0)	1.000
Psychotic symptoms				
Mood incongruence	46 (59.0)	35 (60.3)	11 (55.0)	.793
First-rank symptoms	8 (10.3)	6 (10.3)	2 (10.0)	1.000
Relapse	14[b] (17.9)	5 (8.6)	9 (45.0)	.0008

[a]Values are number (percentage) unless otherwise indicated.
[b]Including 1 patient who never achieved remission during the follow-up period.
Abbreviations: IQR = interquartile range, LIFE-RIFT = Longitudinal Interval Follow-Up Evaluation–Range of Impaired Functioning Tool.

between women with sustained remission of postpartum psychosis, women who relapsed following remission of postpartum psychosis, and women in the matched reference cohort.

Brief Symptom Inventory scores were unavailable for 21 women with postpartum psychosis (27%; 16 postpartum psychosis–sustained and 5 postpartum psychosis–relapse) and 34 women from the matched reference group (11%).

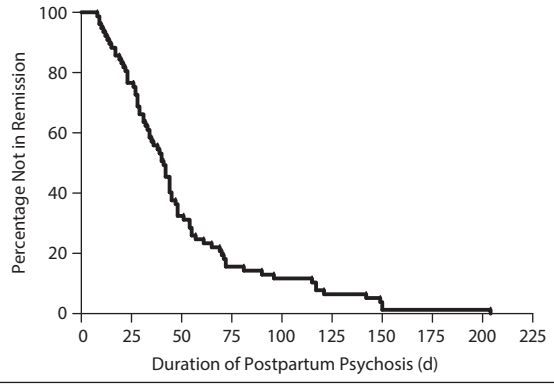
Differences between subsamples were tested with the Mann-Whitney *U* test for continuous variables and Pearson χ^2 and Fisher exact test for categorical variables. Effect sizes were calculated to estimate the magnitude of the effect. Correlation coefficients (*r*) were calculated with respect to continuous outcomes (LIFE-RIFT and BSI), while an odds ratio (OR) was calculated with respect to dichotomized outcomes. Analyses were conducted using SPSS version 20.0 (IBM Corp, Armonk, NY).

RESULTS

Demographic Characteristics

Patients with a postpartum psychosis were predominantly of Dutch origin (89.7%), had completed postsecondary education (53.8%), and were primiparous (79.5%). The mean (± SD) age of the total study group was 32.1 ± 5 years with a median onset of the first symptoms occurring 7 days after delivery (Table 1). The majority of patients experienced manic-psychotic symptoms (n = 45, 57.7%), while 28 patients were diagnosed with a mixed or depressed-psychotic episode (35.9%) and 5 with a nonaffective postpartum psychosis (6.4%). Psychotic symptoms were predominantly mood-incongruent (n = 46, 59.0%) and 8 patients experienced first-rank symptoms. After treatment, patients were in full remission, a median of 40.5 days postpartum (interquartile range [IQR], 26–57).

Figure 2. Kaplan-Meier Curve of the Duration of Postpartum Psychosis in Days



Relapse

Nine months postpartum, 64 patients (82.1%) had a sustained remission (postpartum psychosis–sustained), 13 patients (16.7%) experienced a relapse (postpartum psychosis–relapse), and 1 patient never remitted (1.3%). The median period from complete remission to relapse was 53 days (IQR 28–94). Only 3 women (3.8%) relapsed within 1 month after full remission (on days 19, 23, and 28) (see Figure 2). Of the 13 patients who relapsed, 11 women experienced a depressive episode (14.1%), 1 woman experienced a nonaffective psychosis (1.3%), and 1 woman had a manic episode (1.3%).

Table 2. LIFE-RIFT Scores[a] in Patients With Postpartum Psychosis

	Postpartum Psychosis–All (N = 78)		Postpartum Psychosis–Sustained (n = 64)		Postpartum Psychosis–Relapse (n = 14)[c]		Postpartum Psychosis–Sustained vs Postpartum Psychosis–Relapse	
LIFE-RIFT	n	%	n	%	n	%	*P* Value	Effect Size (OR)
Percentage good functioning[b]								
Work	44	56.4	41	64.1	3	21.4	.007	6.54
Interpersonal Relations	64	82.1	56	87.5	8	57.1	.012	5.26
Satisfaction	52	66.7	48	75.0	4	28.6	.002	7.52
Recreation	56	71.8	52	81.3	4	28.6	<.001	10.87
Total	58	74.4	53	82.8	5	35.7	.001	8.70
Median scores (total)	Median	IQR	Median	IQR	Median	IQR	*P* Value	Effect Size (*r*)
Work	2.0	1.0–3.0	2.0	1.0–3.0	3.0	2.8–4.0	.002	0.34
Interpersonal Relations	1.0	1.0–2.0	1.0	1.0–2.0	2.0	1.8–3.0	.002	0.35
Satisfaction	2.0	1.0–3.0	2.0	1.0–2.8	3.0	2.0–4.0	<.001	0.45
Recreation	2.0	1.0–3.0	2.0	1.0–2.0	3.0	2.0–4.0	<.001	0.47
Total	7.0	5.0–11.0	7.0	4.0–9.0	11.0	8.8–13.5	<.001	0.44

[a]A higher score indicates more functional impairment.
[b]Score ≤ 2 (subscale) or ≤ 10 (total score).
[c]Including 1 patient who never achieved remission during the follow-up period.
Abbreviations: IQR = interquartile range, LIFE-RIFT = Longitudinal Interval Follow-Up Evaluation–Range of Impaired Functioning Tool.

Among the 64 patients with psychosis limited to the postpartum period, the relapse rate was 20.3% (13/64). Of the remaining 14 patients with a history of nonperipartum mania or psychosis, the relapse rate was 7.1% (1/14) (Fisher exact test, $P = .28$).

Psychosocial Functioning

Nine months postpartum, 74.4% (58/78) of patients with postpartum psychosis exhibited good overall functioning based on the total LIFE-RIFT score (Table 2). Patients with a relapse exhibited a significantly greater impairment of daily functioning (median total LIFE-RIFT score = 11.0; IQR, 8.8–13.5), compared to patients with sustained remission (median total LIFE-RIFT score = 7.0; IQR, 4.0–9.0; $r = 0.44$; $P < .001$). Of the 64 patients in sustained remission, 82.8% (53/64) had a score indicative of good functioning in all domains of the LIFE-RIFT, compared to only 35.7% (5/14) of patients with a relapse during follow-up. Patients with a relapse had significantly reduced functioning on both continuous and dichotomous scores across all 4 subscales (Table 2). Effect sizes showed medium to large effects on the continuous subscale scores (r values ranged from 0.34 to 0.47) (Table 2). Moreover, the duration of the acute episode was predictive of impairment in daily functioning at 9 months postpartum. Women with impaired functioning (n = 20; LIFE-RIFT total score ≥ 11) had a significantly longer duration of episode (median = 44 days; IQR, 40–115) compared to women with good functioning (n = 58; median duration of episode = 34 days; IQR, 23–55; Mann-Whitney U, $P = .015$). No significant difference in median total LIFE-RIFT score was observed for any of the other variables measured, including demographics, psychiatric history, or phenomenology. None of the other clinical or demographic characteristics were associated with impairment in functioning (Table 1).

Interpersonal Relations

Most women (65/78, 83.3%) reported having good to very good interpersonal relations with their spouse, friends, and child(ren). Of the 13 women reporting problems with interpersonal relations, 5 women described problems with their spouse and friends; 3 women described problems with their spouse, child(ren), and friends; and 5 women reported problems limited to a single category (2 with friends, 2 with children, and 1 with her spouse).

Resumption of Work

Nine months postpartum, the vast majority of patients had fully resumed their premorbid employment and household responsibilities (69/78, 88.5%), with only a minority on medical leave (9/78, 11.5%). Notably, the rate of medical leave was similar between patients with sustained remission (7/64, 10.9%) compared to those with a relapse (2/14, 14.3%) (Fisher exact test, $P = .66$; OR = 1.36). There was no significant difference in medical leave between patients with or without a history of mania or psychosis outside the postpartum period (Fisher exact test, $P = .35$; OR = 4.96). In addition, the proportion of women engaged in paid work was similar for patients with or without a prior psychiatric history (Fisher exact test, $P = .17$; OR = 2.68). On the Work subscale of the LIFE-RIFT, 56.4% (44/78) of patients scored minimal or no problems at work and/or household responsibilities.

Lastly, overall good scores were given in the LIFE-RIFT subscales of Global Satisfaction (66.7% [52/78]) and Recreation (71.8% [56/78]).

Psychological Distress

Brief Symptom Inventory (BSI). Patients with postpartum psychosis had significantly elevated BSI scores on 2 of the 4 subscales in comparison to the matched reference group (Table 3: Depression and Anxiety), but effect sizes were small (r, Depression: 0.14 and Anxiety: 0.12). No significant differences were observed between patients and the matched reference group on the subscales of Interpersonal Sensitivity and Hostility. Patients with sustained remission had significantly higher scores on the

Table 3. Brief Symptom Inventory (BSI) Scores of all Patients With Postpartum Psychosis, Compared to a Matched Population-Based Reference Cohort Group (Generation R [Gen R]) and Postpartum Psychosis Patients in Sustained Remission and Patients With a Relapse Compared to Gen R

BSI Subscale	Postpartum Psychosis–All (n = 57) Median (IQR)	Gen R (n = 284) Median (IQR)	*P* Value	Effect Size *(r)*	Postpartum Psychosis–Sustained (n = 48) Median (IQR)	Gen R (n = 284) Median (IQR)	*P* Value	Effect Size *(r)*	Postpartum Psychosis–Sustained (n = 48) Median (IQR)	Postpartum Psychosis–Relapse (n = 9) Median (IQR)	*P* Value	Effect Size *(r)*
Interpersonal sensitivity	0.25 (0.00–0.50)	0.00 (0.00–025)	.156	0.08	0.00 (0.00–0.50)	0.00 (0.00–025)	.620	0.03	0.00 (0.00–0.50)	0.50 (0.25–0.75)	.040	0.27
Depression	0.17 (0.00–0.33)	0.00 (0.00–0.21)	.012	0.14	0.00 (0.00–0.33)	0.00 (0.00–0.21)	.174	0.08	0.00 (0.00–0.33)	0.67 (0.17–1.33)	.007	0.36
Anxiety	0.17 (0.00–0.50)	0.17 (0.00–0.33)	.034	0.12	0.17 (0.00–0.50)	0.17 (0.00–0.33)	.173	0.08	0.17 (0.00–0.50)	0.33 (0.17–0.92)	.095	0.22
Hostility	0.00 (0.00–0.20)	0.20 (0.00–0.20)	.238	–0.07	0.00 (0.00–0.20)	0.20 (0.00–0.20)	.080	–0.10	0.00 (0.00–0.20)	0.20 (0.10–0.50)	.070	0.24

Abbreviation: IQR = interquartile range.

BSI subscales of Interpersonal Sensitivity and Depression compared to patients who relapsed (Table 3, median effect size). Notably, patients with sustained remission demonstrated no significant differences compared to the matched reference group on any of the BSI subscales (Table 3).

We examined the Spearman correlation coefficients between LIFE-RIFT scores and BSI items. Negative Affect on the BSI was associated with functioning across several domains, most prominently, Satisfaction and Recreation (Supplementary eTable 1).

DISCUSSION

Psychosocial Functioning

All 78 women with postpartum psychosis and inpatient psychiatric treatment experienced substantial impairment of every aspect of life functioning during the acute episode. Remarkably, however, the majority exhibited substantial or complete recovery of life functioning within 9 months postpartum. Nearly three-quarters of patients with postpartum psychosis reported functional recovery on the LIFE-RIFT domains of work, interpersonal relationships, recreation, and global satisfaction. Moreover, most patients (88.5%) had resumed their employment and household responsibilities 9 months postpartum. In our study, 9 patients (11.5%) described problems with their partners; none of the patients were separated from their partners during the first 9 months postpartum. One previous study showed a divorce rate of 18% after a 12-year follow-up period.[12]

As expected, functioning was more severely impaired in patients who experienced a relapse compared to those with sustained remission—only 28.6% of patients with a relapse reported being satisfied with their life, compared to 75.0% of patients in sustained remission. Although encouragingly, only 2 of the 14 patients who relapsed were still on medical disability leave at 9 months postpartum, suggestive of a relatively short duration of the relapse episodes.

Similar to Blackmore and colleagues,[12] we also observed that the duration of the acute episode was significantly correlated with impairment in daily functioning.

Comparison to the General Postpartum Population

Women with a postpartum psychosis reported more depressive and generalized anxiety symptoms 9 months postpartum compared to a population-based matched control group. Notably, however, the effect sizes were generally small. Moreover, the majority of this difference was explained by the burden of affective symptoms in the subgroup of women who experienced a relapse (14/78, 17.9%). In a retrospective cohort study from Blackmore et al,[12] 26% of women reported ongoing symptoms 1 year postpartum.

Together, our findings suggest a generally optimistic prognosis for women with acute postpartum affective psychosis, for whom a return to their prior level of functioning is highly likely within 1 year postpartum.

Comparison to First-Onset Bipolar Disorder Outside the Postpartum Period

We did not detect differences in psychosocial functioning between women with postpartum psychosis limited to the postpartum period compared to those with a history of nonperipartum mania or psychosis. However, the small sample size of the group with a history of nonperipartum mania or psychosis (n = 14) would have precluded us from detecting potential differences of small or medium effect size.

We compared our findings to the literature on psychosocial functioning of patients after their first episode of mania outside the postpartum period. A recent meta-analysis[22] described pooled symptomatic recovery rates of 62% (95% CI, 42%–79%; 8 studies) following a first episode of mania outside the postpartum period. Therefore, our results support previous reports suggesting a superior prognosis following postpartum mania or affective psychosis compared to nonpostpartum onset.[23,24]

Several risk factors have been reported as associated with impaired functioning after a first-onset bipolar episode: family history of affective disorder, earlier age at onset, comorbid drug or alcohol use, mood-incongruent psychosis, symptom severity, nonadherence to medication, comorbid substance abuse, low socioeconomic status, poor premorbid function, and treatment noncompliance.[22,25–29] In the current study, most women had a high socioeconomic status with

good premorbid function, demonstrated good treatment compliance, and had minimal drug or alcohol use. Therefore, the relatively improved functional outcomes that we have observed could be attributed to the postpartum onset and/or more favorable risk factor profile.

Limitations

We recognize a number of limitations in our study. Data on the BSI were unavailable for 27% (21/78) of the postpartum psychosis cohort, attributable to the data collection procedure by which we chose to minimize the length of the face-to-face interview by asking the patient to complete the BSI questionnaire afterward and return it by postal mail. This procedure might have resulted in a selection bias among the returned BSI questionnaires, although we found no demographic characteristics or psychosocial functioning metrics that were significantly associated with completion of BSI questionnaires.

The specialized care within an MBU might hamper generalization of our findings to other psychiatric units. Unfortunately, many regions in the world do not have MBU care within a reasonable travel distance for the patient. When mother and baby are separated during admission, the understandable wish to reunite them might lead to discharge prior to a full clinical remission. In contrast, in our study, most patients were released only after complete remission of symptoms. This might have lowered relapse risk, leading to better functional outcome. Moreover, specialized MBU treatment to improve bonding and mother-baby interaction might have had a positive effect on psychosocial functioning in our patient group.

CONCLUSION

The current study demonstrates that psychosocial functioning was preserved in the vast majority of postpartum psychosis patients 9 months postpartum. Psychosocial functioning of patients who relapsed after their initial remission was more impaired compared to that of patients in sustained remission, but even within this subgroup, most women had largely resumed their premorbid function. Overall, the prognosis for postpartum psychosis patients is highly optimistic for achieving clinical remission and returning to their premorbid level of functioning.

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Supplementary Material

Article Title: Functional Recovery After Postpartum Psychosis: A Prospective Longitudinal Study

Author(s): Karin M. Burgerhout, MD; Astrid M. Kamperman, PhD; Sabine J. Roza, MD, PhD; Mijke P. Lambregtse-Van den Berg, MD, PhD; Kathelijne M. Koorengevel, MD, PhD; Witte J. G. Hoogendijk, MD, PhD; Steven A. Kushner, MD, PhD; and Veerle Bergink, MD, PhD

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List of Supplementary Material for the article

1. Longitudinal Interval Follow-up Evaluation–Range of Impaired Functioning Tool (LIFE-RIFT)

Disclaimer

This Supplementary Material has been provided by the author(s) as an enhancement to the published article. It has been approved by peer review; however, it has undergone neither editing nor formatting by in-house editorial staff. The material is presented in the manner supplied by the author.

LONGITUDINAL INTERVAL FOLLOW-UP EVALUATION-RANGE OF IMPAIRED FUNCTIONING TOOL (LIFE-RIFT)

THE LIFE-RIFT

Work

(1 a) Employment: _____

Which of the following categories best characterizes the degree to which the patient's current (past week) work activities have been impaired as a result of psychopathology?

0 = Not applicable. Did not work during the past week, for reasons other than psychopathology.

1 = No impairment - high level. Worked as much as someone in his social situation would be expected to work, and worked at a high level.

2 = No impairment - satisfactory level. Worked as much as someone in his social situation would be expected to work, and worked at a satisfactory level.

3 = Mild impairment. Worked somewhat less than someone in his social situation would be expected to work and/or had mild difficulties in carrying out work activities.

4 = Moderate impairment. Has missed a lot of work and/or has had considerable difficulties in carrying out work activities.

5 = Severe impairment. Has missed a great deal of work when someone in his social situation would have been expected to work and/or has been virtually unable to carry out his work activities when he did work.

6 = No information.

(1 b) Household: _____

Which of the following categories best characterizes the degree to which the patient's current (past week) household work has been impaired as a result of psychopathology?

0 = Not applicable. Did not carry out household duties during the past week for reasons other than psychopathology.

1 = No impairment - high level. Has carried out housework most of the time that would be expected, and worked at a high level.

2 = No impairment - satisfactory level. Has carried out housework most of the time that would be expected, and worked at a satisfactory level.

3 = Mild impairment. Worked somewhat less than expected and/or had mild difficulties in carrying out housework.

4 = Moderate impairment. Has missed a lot of housework when expected and/or has had considerable difficulties in carrying out house work.

5 = Severe impairment. Has missed a great deal of housework when expected to work and/or has been virtually unable to carry out housework when he attempts it.

6 = No information.

(1 c) Student: _____

Which of the following categories best characterizes the degree to which the patient's current school work has been impaired as a result of psychopathology?

0 = Not applicable. Because not currently enrolled in a student program for reasons other than psychopathology.

1 = No impairment - high level. Worked as much as would be expected if not symptomatic and got high grades.

2 = No impairment - satisfactory level. Worked as much as would be expected if not symptomatic and got satisfactory grades.

3 = Mild impairment. Worked somewhat less and/or got grades somewhat below expected if not symptomatic.

4 = Moderate impairment. Missed a lot of school work and/or got grades consistently below expected.

5 = Severe impairment. Missed most of school work and/or dropped out of school or got grades far below those expected.

6 = No information.

(1) Work (maximum of 1 a, 1 b and 1 c): _____

Interpersonal relations

Which of the following best characterizes the patient's level of interpersonal relationships with his family currently (past month)? [Provide separate ratings for spouse (2a), children (2b) and other relatives (2c).]

(2a) Interpersonal relations with spouse: _____

(2b) Interpersonal relations with children: _____

(2c) Interpersonal relations with other relatives: _____

0 = Not applicable because does not have relatives in this category.

1 = Very good. Experiences very good relationships with this/these family member(s), with only transient friction which is rapidly resolved. Feels only very minor or occasional need to improve quality of relationship, which is usually close and satisfying.

2 = Good. Argues occasionally, but arguments usually resolve satisfactorily within a short time. May occasionally prefer not to be with them because of dissatisfaction with them or be actively working with them to improve relationship.

3 = Fair. Often argues with this (these) family member(s) and takes a long time to resolve arguments. May withdraw from this person (these people) due to dissatisfaction. Often thinks that relationship needs to be either more harmonious or closer emotionally even when no conflict is present. For those relatives not living with the subject, contacts with them by choice are less frequent than feasible or rarely enjoyed very much when made.

4 = Poor. Regularly argues with this (these) family member(s) and such arguments are rarely ever resolved satisfactorily. Regularly prefers to avoid contact with them and/or feels great deficit in emotional closeness. For those family members out of the household, subject avoids seeing them as much as possible and derives no pleasure from contact when made.

5 = Very poor. Either constantly argues with this (these) family member(s) or withdraws from them most of the time. Separated or divorced from spouse or children moved out of household or almost always hostile to them when in contact.

6 = Variable. Different levels for various members of this group, and would warrant a rating of good or better (2, 1) with at least 1 member of this group. (Rate as 2.)

7 = Variable. Different levels for various members of this group, and would not warrant a rating of good or better (2, 1) with any member of this group. (Rate as 4.)

8 = No information.

(2d) Interpersonal relations with friends:

Which of the following best characterizes the patient's interpersonal relationships with friends currently (past month)?

1 = Very good. Had several special friends that he saw regularly and frequently and was close to.

2 = Good. Had at least two special friends that he saw from time to time and was fairly close to.

3 = Fair. Had only one special friend that he saw from time to time and was fairly close to; or contacts limited to several friends that he was not very close to emotionally.

4 = Poor. Had no special friends he saw from time to time and was fairly close to; or contacts limited to one or two friends that he was not very close to.

5 = Very poor. Had no special friends and practically no social contacts.

6 = No information.

(2) Interpersonal relations (maximum of 2a, 2b 2c and 2d): _____

Satisfaction

(3) Satisfaction : _____

Which of the following best characterizes the patient's overall level of satisfaction (contentment, degree to which he feels fulfilled, gratification derived from activities) for the past week.

1 = Very good. Transient problems may occur, but generally satisfied with all aspects of his life. Occasional minor dissatisfaction in one area, but overall is quite content with himself, job, family, friends, activities, and finances.

2 = Good. Mild dissatisfaction persists, but only in one area or is intermittent in several areas. In balance, is generally content and able to enjoy life most of the time, but does think there should be some improvement in either occupational role, interpersonal relations, sexual activities, or finances.

3 = Fair. Moderate dissatisfaction in one or more areas, which is relatively persistent. Either discontent with occupational role, interpersonal relations, sexual activities, or finances.

4 = Poor. Very dissatisfied in most areas and derives little pleasure from life. Rarely able to derive any satisfaction from activities or relationships.

5 = Very poor. Derives no satisfaction from anything. May feel no desire to carry out the smallest task or to be with other people.

6 = No information.

Recreation

(4) Recreation: _____

At what level has the patient been involved in and able to enjoy recreational activities and hobbies (reading, spectator or participant sports, gardening, music, sewing, attending parties or gatherings, church or community organizations) in the past week

1 = Very good. Has at least two activities which he enjoys fully and frequently.

2 = Good. Participates in several activities and does not always enjoy them fully; or participates in fewer activities or less frequently than optimal, but enjoys participation.

3 = Fair. Occasional participation in recreational activities or hobbies; or limited enjoyment when participation occurs.

4 = Poor. Some participation in recreational activities or hobbies, and derives very little enjoyment from such activities.

5 = Very poor. No involvement in recreational activities or hobbies.

6 = No information.

THE LIFE-RIFT SUMMARY

(1) Work (maximum of 1a, 1 b and 1c): _____

(2) Interpersonal relations (maximum of 2 a, 2 b, 2c and 2d): _____

(3) Satisfaction: _____

(4) Recreation : _____

Total score (sum of 1, 2, 3 and 4): _____

Supplementary eTable 1: The Spearman correlation coefficients between the BSI subscales depression and anxiety and domains of functioning.

BSI (n=57)	Interpersonal sensitivity	Depression	Anxiety	Hostility	Total 4 BSI scales
LIFE-RIFT (n=78)					
Work	0.19	0.18	0.31*	0.20	0.29*
Interpersonal relations	0.29*	0.11	0.23	0.20	0.30*
Satisfaction	0.46**	0.47**	0.42**	0.26	0.54**
Recreation	0.39**	0.32*	0.39**	0.13	0.42**
Total LIFE-RIFT	0.38**	0.31*	0.41**	0.23	0.46**