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A perinatal psychiatric service audit in New Zealand: Patient characteristics and outcomes*

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Summary

As part of a clinical audit, data were collected on all patients assessed and offered treatment by the Christchurch 'Mothers and Babies' Service between 1-7-98 and 30-6-2000. At assessment and discharge a comprehensive psychiatric interview and the Marcé Checklist were completed by clinicians and self-rating questionnaires were completed by the patient. Univariate analysis and logistic regression were performed on the variables collected. A significant proportion of women suffered from chronic recurrent psychiatric disorders. Pure 'postnatal depression' was uncommon. Thirty-eight percent of women were pregnant at assessment. Risk factors for poor maternal outcomes included history of chronic illness, high symptomatic scores at assessment, the presence of more than one Axis I diagnosis (excluding nicotine dependence) or an Axis II diagnosis, and poor interpersonal relationships. Perinatal psychiatric services need resources to treat women with a range of severe and chronic disorders and should pay attention to interpersonal issues in treatment.

Keywords: Perinatal psychiatric illness; Mother-baby care.

Introduction

To date there has been relatively little information on the characteristics of patients attending perinatal psychiatric services, particularly outpatient services. Mother and Baby inpatient characteristics have been described in units in England (Meltzer and Kumar, 1985; Kumar et al., 1995), Australia (Buist et al., 1990; Milgrom et al., 1998), France (Cazas et al., 1990; Poinso et al., 2002) and the Netherlands (Klompenhouwer and van Hulst, 1991). Oates (1988) has described a model of community care for very unwell mothers. The day program at Stoke-on-Trent has been described by Boath et al. (1999), who considered this treatment to be more effective than non specialist service treatments in the locality. In this issue others also contribute information (Salmon et al. (2003); Glangeaud-Freudenthal et al. (2003)) on patient characteristics.

Christchurch, located in the province of Canterbury, is the largest city in the South Island of New Zealand. The service is relatively unusual in that, unlike most other perinatal psychiatric services in Australasia or the United Kingdom, it provides an integrated inpatient and outpatient service. It has close links with both Plunket Nurses who are community based, specialised, well-child health care nurses and also with primary care doctors (general practitioners). In France several Mother-Baby Units (MBU) have paediatric nurses and integrated or co-ordinated inpatient and outpatient services. Clinicians and researchers highlight the importance of the integration of inpatient, outpatient and primary care services (Barnett, 1996; Brockington, 1996).

One of the concerns of a perinatal psychiatric service is the effect of parental psychiatric illness on infants and their older siblings. Maternal psychiatric disorder can have a significant detrimental impact on child social, emotional and cognitive development (McNeil et al., 1985; Radke-Yarrow et al., 1992). A number of studies have looked specifically at the effects of maternal postnatal depression on the infants (Murray, 1997a) and their subsequent, development (Murray et al., 1996; Murray

* The material was presented at the Marcé Society International Biennial Scientific Meeting in Sydney (Australia) in 2002 (25–27 September 2002).

et al., 1999; Beck, 1998; Beck, 1999). These effects may vary considerably and there may be important compounding factors such as low socio-economic status and male gender of the infant (Murray, 1997b; Kurstjens and Wolke, 2001). Carter et al. (2001) demonstrated that the presence of comorbidity, rather than depression itself, was associated with impaired attachment and toddler social-emotional problems. In children who have a parent with a psychiatric illness there is an exponential relation between poor child outcome and increase in number of risk factors (Rutter and Quinton, 1984).

This audit aimed, first, to describe the characteristics of patients attending the service. We were interested in comparing these with the Canterbury population and to compare outpatients with patients who were admitted to the inpatient unit. Second, the study examined outcomes for all patients in relation to a number of variables, particularly looking for risk factors for poor outcomes for both the mother and the infant. This paper will address the outcomes for the mother only and data on outcome for the baby will be presented in another publication.

Patients and methods

The Christchurch Mothers and Babies Psychiatric Service provides a comprehensive psychiatric assessment of women who are either in the second or third trimester of pregnancy or have care of baby under one year of age and who have a known or suspected psychiatric disorder. The Canterbury region's population is 500,000, and the birth population is 5,000 per year. The team is multidisciplinary with psychiatrists, nurses, psychologists, social workers, and part-time physiotherapist and dietician. Treatment that is offered includes: medical treatments, supportive counselling, cognitive-behavioural therapy, interpersonal psychotherapy, mother-infant psychotherapy, group programs, relaxation training, psycho-education with an emphasis on family meetings, parenting education, access to respite care and community networking.

All women assessed and offered treatment between 1-7-98 and 31-6-2000, were included in the audit of service practices and patient outcomes. During this time period 317 women were assessed. Forty-seven were not offered treatment because they were not sufficiently unwell or disabled as a result of their psychiatric illness, to warrant specialist treatment, as we had limited resources. These women were referred back to their primary care doctor. A total of 270 women were assessed and treated. Of these, 93 were admitted to the inpatient unit at some time during their contact (and thus were included in our inpatient group) with the service. Since this was an audit and no patient identifying data were obtained, ethics committee approval was not required.

The data were collected in a number of ways. Our assessment interview consisted of a comprehensive psychiatric history, which took two to three hours and included detailed information on past psychiatric history, medication and drug history, family history, history of interpersonal functioning, obstetric history and a description of all current main relationships (including with all children). The percentage of time spent unwell as a result of an Axis I diagnosis in the previous 10 years was estimated. Information was collected from the patient, a significant other and other agencies if they were involved. Axis I and II diagnoses were made according to DSM-IV criteria (American Psychiatric Association 1994). All patients were assessed by two team members including a psychiatrist who made the multi-axial diagnoses. At assessment patients completed the Edinburgh Postnatal Depression Scale (EPDS) (Cox and Holden, 1987).

The principal clinician also completed a slightly modified version of the Marcé Checklist (Appleby and Friedman, 1996) at assessment. This included the sections on: subject demographics, baby demographics, referral process, purpose of admission, social and marital data, psychiatric history including drug use in pregnancy and family history, obstetric data, duration and nature of current illness and thoughts or actions of harm to self or baby.

At discharge from the service the clinician assessed the GAF for current functioning, and the Global Outcome Rating (GOR) (symptom free, significantly improved, slightly improved or no change/worse). The latter is part of the Marcé checklist and was collected for comparison with data collected elsewhere using this instrument. It was expected that there would be considerable overlap between GAF and GOR. The presence of past and present physical and sexual abuse was also recorded (definitions of and data pertaining to abuse will be presented in a subsequent paper).

Analysis of the data

Chi-square and Fisher's exact test were used to compare patient characteristics of the Mothers and Babies Psychiatric Service to the Canterbury population, and to compare diagnoses at assessment, past psychiatric history, and family history between inpatients and outpatients. Univariate analyses exploring potential associations with poor outcome were conducted using chi-square, Fisher's exact test, and independent t-tests. Those variables showing some association ($p < 0.10$) were then entered into a logistic regression model. All statistical analyses were performed using SPSS 10.0.

Results

Socio-Demographic characteristics and obstetric details

Table 1 presents demographic information for outpatients and inpatients and their partner, and, where available, the Christchurch population.

Compared to the Christchurch population, patients of the Mothers and Babies Service were more likely to be first-time mothers (Chi-square = 14.178, df = 1, $p < 0.01$), less likely to be NZ European (Chi-square = 15.292, df = 1, $p < 0.01$) and less likely to have had a Caesarian section (Chi-square = 24.68, df = 1, $p < 0.01$).

A number of patients were pregnant at the time of their assessment, with outpatients (n = 67) more likely

Table 1. Characteristics of patients and Canterbury population

	Outpatients (n = 177)	Inpatients (n = 93)	Canterbury population* (n = 4963)
Age			
Mother's mean age (range) years	29 (17–41)	29 (19–41)	29
Baby's mean age (range) months	6 (0–12)	4 (0–9)	N/A
Obstetric details			
Caesarian section	24 (14%)	12 (13%)	27%
Term at delivery <32 weeks	2 (1%)	0 (0%)	1.5%
Term at delivery 32–36 weeks	6 (3%)	4 (4%)	7%
Birth weight <2500 gm	5 (2.8%)	3 (3%)	2.5%
First child	69 (39%)	37 (40%)	29%
Ethnicity			
NZ European (Pakeha)	140 (79%)	63 (69%)	84%
NZ Maori	13 (7%)	10 (11%)	7%
Pacific Islander	1 (1%)	2 (2%)	2%
Asian	6 (3%)	4 (4%)	4%
Other	14 (8%)	4 (4%)	3%
Not reported	3 (2%)	10 (10%)	
Socio-economic status			
Professional/managerial	41 (23%)	13 (14%)	N/A
Skilled manual	48 (27%)	21 (23%)	N/A
Semi-skilled/unskilled	75 (42%)	49 (54%)	N/A
Not reported	13 (8%)	10 (10%)	
Receiving DPB**	46 (26%)	23 (25%)	N/A
Single/No partner	38 (22%)	20 (22%)	N/A
Partner mental illness	29 (17%)	23 (25%)	N/A
Antisocial partner	17 (10%)	15 (16%)	N/A

* Ministry of Health, 2001. *Report on Maternity 1999.* Wellington, New Zealand.
** DPB: Domestic Purposes Benefit – a government subsidy for parents without a live-in partner.
N/A = either not applicable or not available.

than inpatients (n = 23) to be pregnant at this time (38% vs 25%, Chi-square = 4.724, df = 1, $p < 0.05$).

Medications and drug use during pregnancy and breast-feeding

Similar proportions of pregnant inpatients and outpatients were prescribed psychotropic medication at some stage during their pregnancy (23% and 27% respectively). Some women were taking more than one medication so the figures presented refer to prescriptions and not to number of women. The most commonly prescribed medications were the SSRIs (total of 48) followed by tricyclic antidepressants (23). There were 14 prescriptions for antipsychotics, 6 oral and 8 depot. There were 10 prescriptions for mood stabilisers and 4 of benzodiazepines. Nearly all women received medication during treatment but most had stopped breast feeding at the time of prescribing. The rate of prescribing during breast-feeding was much higher than for pregnant women in both inpatients and outpatients (82% and 78% respectively). The pattern of prescribing was, however, similar to that of the pregnant women. One woman on lithium was breast feeding. The clinician assessed that alcohol had been used to excess during the pregnancy in 14% of women, marijuana in 8% and cigarettes in 32%.

Diagnoses at assessment, past psychiatric history and family history

Table 2 presents a summary of the diagnoses in this sample. The most common were unipolar and bipolar affective disorders.

The combined inpatient and outpatient ''other'' primary Axis I diagnoses consisted of: Post Traumatic Stress Disorder (5), Panic Disorder without Agoraphobia (4), Acute Stress Disorder (2) Generalised Anxiety Disorder (2), Dysthymia (2), Depressive Disorder NOS (2), Obsessive-Compulsive Disorder (2), Organic Brain Disorders (2), Brief Psychotic Disorder, Factitious Disorder,

Table 2. Diagnoses at assessment, past psychiatric history and family history

	Outpatients (n = 177)	Inpatients (n = 93)
Primary axis I diagnosis		
Unipolar, recurrent	119 (67%)	41 (44%)
Unipolar, single episode	18 (10%)	6 (7%)
Bipolar I	4 (2%)	12 (13%)
Bipolar II	10 (6%)	5 (5%)
Bipolar NOS	7 (4%)	8 (8%)
Schizoaffective/schizophrenia	1 (0.5%)	6 (7%)
Adjustment disorder	1 (0.5%)	3 (3%)
Other	17 (9%)	12 (13%)
Secondary axis I diagnosis		
Anxiety disorder	45 (25.5%)	30 (32%)
Substance use disorder	7 (4%)	14 (15%)
Mood disorder	11 (6%)	9 (10%)
Eating disorder	5 (3%)	2 (2%)
Adjustment disorder	1 (0.5%)	0 (0%)
No secondary disorder	108 (61%)	38 (41%)
Axis II personality disorder diagnosis	26 (15%)	28 (30%)
Past psychiatric history		
Previous postpartum illness	71 (40%)	37 (40%)
Previous hospitalisation	26 (16%)	28 (30%)
Family history		
Psychiatric illness in first degree relative	102 (58%)	42 (45%)
Psychiatric illness in second degree relative	46 (26%)	21 (23%)
Alcohol or substance dependence in parent	32 (18%)	13 (14%)

Substance Induced (carbegoline) Psychosis, Pathological Gambling, Cannabis Dependence, Alcohol Dependence and Polysubstance Dependence and no disorder (1 each). The patient with no Axis I disorder had a primary diagnosis of Borderline Intellectual Functioning.

Of the inpatients 20 (22%) were psychotic (suffering from delusions or hallucinations) on admission. These patients were usually suffering from a mood disorder or, less often, either schizoaffective disorder or schizophrenia.

A number of significant differences emerged between outpatients and inpatients in terms of diagnoses at assessment, past psychiatric and family history. Outpatients were more likely to have a diagnosis of major depression, recurrent or single episode (Chi-square = 20.269, df = 1, $p < 0.01$) and to have only one Axis I illness (Chi-square = 9.974, df = 1, $p < 0.01$). Inpatients, on the other hand, were more likely to have schizophrenia or schizoaffective disorder (Fisher's exact t-test, 2-tailed, $p = 0.008$), bipolar disorder (Chi-square = 9.727, df = 1, $p < 0.01$), and a secondary diagnosis of substance use disorder (Chi-square = 10.470, df = 1, $p < 0.01$). Inpatients were also more likely to have an Axis II diagnosis (Chi-square = 9.058, df = 1, $p < 0.01$), and twice as likely to have been previously hospitalised (Chi-square = 8.927, df = 1, $p < 0.01$). Finally, outpatients were more likely to have a first degree relative with psychiatric illness (Chi-square = 3.958, df = 1, $p < 0.05$).

Past psychiatric and family history

In women for whom this was a second or subsequent pregnancy, 40% had experienced a previous postpartum illness. Sixteen percent of outpatients and 13% of inpatients had been unwell for more than 5 of the previous 10 years and a further 19% of outpatients and 21% of inpatients for between 2.5 and 5 years. Thus 36% of outpatients and 34% of inpatients had spent more than a quarter of the previous 10 years unwell due to an Axis I disorder.

Current episode and length of treatment

The duration of the current Axis I illness was over 12 months for 30% of women, with over half of these experiencing episodes longer than 2 years. The median length of treatment with the service was: for outpatients (n = 177)

203 days (range 12–706) and inpatients (n = 93) 234 days (range 10–826). Those with lengthy contact had a second child prior to discharge. Median duration of inpatient stay was 26 days (range 1–149). Seventeen per cent of inpatients were placed under the Mental Health Act.

The women who were currently well (n = 11) at outpatient assessment were women with histories of severe, usually psychotic, psychiatric disorders. They were seen by the service for prophylactic treatment and monitoring of their mental state. Those who were not acutely unwell (n = 3) when admitted to the inpatient unit were women with psychotic disorders who were admitted for assessment of mental state and parenting because of significant concern about capacity to parent.

Note that the discharge measures were undertaken at the time of discharge from the service, which, if a woman had been an inpatient, was some time after discharge from the ward. Timing of discharge was typically determined by either clinical improvement, or, removal of the child from any care by the mother, or, the infant being aged over 15 months (in the absence of a subsequent pregnancy). Discharge was either to an adult general psychiatric service, if the patient remained significantly unwell, or to a General Practitioner.

Analyses of maternal outcome

At the time of discharge from the service 127 (47%) patients were significantly improved according to the global outcome rating and 74 (27%) patients were symptom free. However, 62 (23%) patients received a poor global outcome rating of slightly improved (n = 39) or no change/worse (n = 24), with 42 of these patients also having a GAF score less than 65. Overall, 50 patients (19%) had a GAF less than 65. Of the missing data, 9 patients had no GAF at discharge, and 7 no GOR.

Table 3 presents the results of the univariate analysis investigating the relations among demographic, diagnostic variables, past psychiatric history, relationship vari-

Table 3. Univariate analyses of factors relating to maternal outcomes

	GAF < 65 (n = 50)	GAF > 65 (n = 211)	Poor GOR (n = 62)	Good GOR (n = 201)
Demographics[a]				
Ethnic minority	15 (31%)	37 (17.5%)	16 (26%)	35 (17%)
Socio-economic index				
Semi-skilled/unskilled	30 (63%)	95 (45%)	35 (59%)	89 (42%)
Substances used to excess				
Cigarettes during pregnancy	24 (48%)*	59 (28%)	25 (43%)	57 (38%)
Alcohol during pregnancy	7 (14%)	26 (12%)	11 (18%)	20 (10%)
Cannabis during pregnancy	3 (6%)	17 (8%)	5 (8%)	13 (6.5%)
Diagnoses at assessment[a]				
Schizophrenia/schizoaffective	2 (4%)	4 (2%)	3 (5%)	3 (1.5%)
Bipolar disorder	6 (12%)	39 (18%)	8 (13%)	37 (18%)
Major depression	31 (62%)	146 (69%)	40 (65%)	131 (65%)
More than 1 axis I disorder	38 (76%)***	101 (48%)	41 (66%)*	94 (47%)
Secondary anxiety disorder	20 (40%)*	54 (26%)	25 (40%)*	47 (23%)
Medium/high suicide risk	8 (16%)	25 (12%)	9 (15%)	25 (12%)
Axis II personality disorder	20 (40%)***	32 (15%)	20 (32%)**	31 (15%)
Past psychiatric history[a]				
More than 24% of previous 10 years unwell	26 (52%)**	63 (30%)	33 (53%)***	54 (27%)
Significant relationships[a]				
Not married/defacto at assessment	22 (44%)*	61 (29%)	25 (42%)*	46 (23%)
Relationship with partner <12 months	6 (15%)	19 (9%)	6 (12%)	18 (9%)
Poor relationship with partner	23 (56%)*	18 (8.5%)	26 (51%)	25 (12%)
Poor relationships with other significant persons	31 (66%)***	16 (8%)	32 (55%)**	26 (13%)
Functioning/symptoms[b]				
Mean GAF score at assessment (SD)	53.5 (6.26)***	58.6 (12.21)	55.87 (7.00)	57.85 (12.5)
Mean EPDS score at assessment (SD)	19.5 (6.02)**	16.8 (5.9)	19.12 (6.09)*	16.96 (5.87)

[a] Chi-square analysis.
[b] Independent samples t-test.
* $p < .05$; ** $p < .01$; *** $p < .001$.

ables, level of functioning at assessment and the two measures of poor maternal outcome.

Compared to women with a GAF score over 65, women with a low GAF score (65) at discharge showed a trend toward ethnic minority status (Chi-square = 3.562, df = 1, p = 0.059), and semi-skilled or unskilled socio-economic index (Chi-square = 2.821, df = 1, p = 0.093). They were significantly more likely to have smoked more than 5 cigarettes per day during pregnancy (Chi-square = 6.644, df = 1, $p < 0.05$). In terms of diagnosis, women with a GAF less than 65 were significantly more likely than those with scores over 65 to have more than one Axis I diagnosis (Chi-square = 13.644, df = 1, $p < 0.01$), to have a secondary anxiety disorder (Chi-square = 4.130, df = 1, $p < 0.05$), and to have an Axis II diagnosis (Chi-square = 15.626, df = 1, $p < 0.01$). They were also more likely to have spent more than a quarter of the previous 10 years unwell due to mental illness (Chi-square = 8.682, df = 1, $p < 0.01$). In addition, compared with women with a higher GAF, women with a GAF less than 65 were more likely to be unmarried, without a live-in partner (Chi-square = 3.889, df = 1, $p < 0.05$), to have a poor relationship with their partner (Chi-square = 5.904, df = 1, $p < 0.05$), and to have poor relationships with other significant persons in their lives (Chi-square = 15.090, df = 1, $p < 0.01$). They also had significantly lower GAF scores ($t = -4.162$, df = 149.9, $p < 0.01$) and higher EPDS scores ($t = 2.730$, df = 221, $p < 0.01$) at assessment.

The factors associated with a poor GOR were similar to those factors associated with a GAF score less than 65 at discharge. The 62 women who had a poor global outcome rating were significantly more likely than women who significantly improved or were symptom free at discharge to have more than one DSM-IV Axis I diagnosis (Chi-square = 5.214, df = 1, $p < 0.05$), to have a secondary anxiety disorder (Chi-square = 5.906, df = 1, $p < 0.05$), and to have an Axis II diagnosis ($\chi^2 = 7.693$, df = 1, $p < 0.01$). They were also significantly more likely to have spent more than 24% of the previous 10 years unwell due to mental illness (Chi-square = 13.112, df = 1, $p < 0.01$), to be unmarried with no co-habiting partner (Chi-square = 6.709, df = 1, $p < 0.0$), and to have poor relationships with significant persons in their lives (Chi-square = 7.498, df = 1, $p < 0.01$). They also showed a trend toward poor partner relationships (Chi-square = 3.291, df = 1, p = 0.07). Women with a poor global outcome rating had significantly higher EPDS scores at assessment ($t = 2.379$, df = 215, $p < 0.05$) than women who were symptom-free or significantly improved at discharge.

Table 4. Results of different logistic regression analyses of factors relating to two measures of maternal outcome for all patients

Outcome	Odds ratio	(95% CI)	p value
GAF score <65			
Ethnic minority	2.389	(0.871–6.556)	0.091
SEI Semi-skilled/unskilled	0.710	(0.275–1.832)	0.479
Cigarettes during pregnancy	1.707	(0.700–4.158)	0.239
More than 1 Axis I disorder	3.303	(1.050–10.392)	0.041
Secondary anxiety disorder	1.055	(0.389–2.865)	0.916
Axis II personality disorder	1.209	(0.431–3.393)	0.718
More than 24% of last 10 years unwell due to mental illness	2.894	(1.272–6.581)	0.011
Not married/defacto at assessment	1.962	(0.704–5.470)	0.198
Poor relationships with significant persons other than partner	2.249	(0.967–5.232)	0.060
Mean EPDS score at assessment	1.078	(1.002–1.160)	0.044
Poor global outcome rating			
More than 1 axis I disorder	1.263	(0.480–3.322)	0.636
Secondary anxiety disorder	1.783	(0.726–4.377)	0.207
Axis II personality disorder	1.120	(0.442–2.842)	0.811
More than 24% of last 10 years unwell due to mental illness	2.836	(1.401–5.739)	0.004
Not married/defacto at assessment	2.529	(1.206–5.307)	0.014
Poor relationships with other significant persons	1.501	(0.738–3.050)	0.262
Mean EPDS score at assessment	1.072	(1.007–1.141)	0.028

Logistic regression analyses

Table 4 presents odds ratios, 95% confidence intervals, and p values resulting from separate logistic regression analyses performed for each of the two maternal outcome variables amongst all patients.

All variables demonstrating some association ($p < 0.10$) with the outcome variable were entered into logistic regression, with the exception of poor partner relationship and GAF score at assessment. Because of the very strong relationship between poor partner relationship and poor relationships with other significant persons (Chi-square = 17.634, df = 1, $p = 0.001$), and because 27% of patients had missing values due to not having a partner, the decision was made to exclude this variable from the regression models. In addition because GAF score and EPDS Score at assessment were highly correlated ($r = -0.413$, $p < 0.001$), EPDS was chosen to go into the models.

According to the resulting model, three factors significantly contribute to the prediction of a GAF score less than 65 at discharge: spending more than 24% of the last 10 years unwell due to mental illness, higher EPDS score at assessment and having more than one DSM-IV Axis I diagnosis. In addition, having poor relationships with significant others, and being of an ethnic minority showed some association but only approached significance. However, the model inadequately predicted poor outcome and only correctly predicted a GAF at discharge less than 65 in 37.5% of cases, and a GAF 65 or greater in 96% of cases.

For the model of poor Global Outcome Rating (GOR) three factors contributed significantly: having spent more than 24% of the last 10 years unwell due to mental illness, higher EPDS score at assessment and being unmarried without a co-habiting partner. Again, the model was inadequate in predicting poor outcome, correctly predicting poor outcome in only 28% of cases. However it was a better predictor of good outcome, being accurate in 94% of cases.

Discussion

Our data demonstrate that the majority of women attending our service did not suffer from 'simple' or 'pure' postnatal depression but instead suffered from major recurrent mood and/or anxiety disorders. A substantial proportion of women had required hospitalisation on previous occasions and a third of women had suffered from significant symptoms of an Axis I disorder for over a quarter of the previous 10 years. For 30% of women the current Axis I episode had continued for more than a year. Forty-six percent of women suffered from more than one Axis I disorder. Twenty percent suffered from at least one Axis II disorder in addition to at least one Axis I disorder. Thirty eight percent of women were pregnant at assessment. During pregnancy 25.5% of women took psychotropic medication, 14% consumed significant amounts of alcohol, and 32% smoked cigarettes and 8% marijuana, to excess.

In both multiple logistic regression models, two variables, being unwell for more than a quarter of the past 10 years and high EPDS at assessment, predicted a poor outcome. However, given a low predictive power of both models for poor outcome, many women with chronic disorders actually had good outcomes (GAF > 65 or GOR significantly improved or symptom free).

In addition, in predicting a low GAF at discharge, experiencing more than one Axis I disorder predicted poor outcome. In predicting a poor outcome on the GOR, marital status was also predictive. There are substantial other data that suggest being unmarried or having no partner are risk factors for onset of depression (O'Hara, 1986; O'Hara, 1988) but there is little information regarding the impact of these factors on outcome.

A significant number of women seen by the service were pregnant. While some of these women were referred because of a significant past history of psychiatric disorder, many were referred because of current symptomatology. Illness during pregnancy may be a particularly important risk factor for subsequent problems in pregnancy (Zax et al., 1977; Steer et al., 1992) and in the infant (Lundy et al., 1999; Wolkind, 1981; Glover and O'Connor, 2002). Referral at this time enables the use of prophylactic medication which, for bipolar disorder, is known to reduce the risk of relapse (Stewart et al., 1991; Cohen et al., 1995). Wisner et al. (2001) demonstrated that prophylactic use of nortriptyline did not reduce the risk of postpartum depression but postulated that this may have been due to the type of antidepressant and that in this group of women the SSRI's may be the best choice of antidepressant. This would be consistent with the finding of Stowe et al. (1995) and Appleby (1997) that sertraline and fluoxetine respectively, were effective treatments for postnatal depression. It would also be consistent with the finding of Joyce et al. (2003) that young women with depressive illness are more likely to respond to clomipramine or fluoxetine than to nortriptyline.

The New Zealand Mental Health Commission has indicated that psychiatric services should be targeting

the three percent of the population who suffer from the most severe/disabling psychiatric disorders (NZ Mental Health Commission, 1998). Rates of psychiatric disorder are higher for women in their child bearing years, with higher rates of onset in the first few weeks postpartum (Kendell et al., 1987; Cox et al., 1993). It would therefore be reasonable to estimate that more than 3% percent of women in the perinatal period would require specialised psychiatric treatment. The Canterbury birth rate over a two-year period is 10,000, thus, in our catchment area the number of eligible postpartum women would be 300. We received 196 referrals of postpartum women, in this time.

Given that the prevalence of Bipolar I is 0.5–1% and Bipolar II Disorder is the same (Weissman, 1996), in a birth population of 10,000, 100–200 women are at high risk of recurrence from a bipolar disorder. We know that rates of relapse in women with Bipolar I Disorder are between 25–50% and highest if there has been a previous puerperal relapse or a positive history of puerperal psychosis in their mother (Jones and Craddock, 2001). We do not know what the risks for those with Bipolar II or Bipolar NOS are, but we might expect these to be high also. Our data show that we saw approximately equal numbers of Bipolar I, II and NOS and that this was only a fraction of the numbers we could expect to see if all women with bipolar disorders were referred.

Most women seen by the public psychiatric sector would have been seen by our service. The exceptions are those with a primary diagnosis of drug dependence who were seen by an alternative service for outpatient care and some women with anxiety disorders who may have been seen by the specialist anxiety disorders service. In addition, private psychiatry is not well developed in New Zealand with few private practitioners in Christchurch.

This study was carried out as part of routine clinical practice with a number of consequent limitations. Diagnoses were not made using research criteria such as the SCID I or SCID II though we believe that the clinicians were rigorous in their diagnostic approach. Research tools to measure symptom severity such as the Hamilton Depression Scale were not used, however, the EPDS has been used in a wide range of settings with good reliability and validity in a range of cultures (Boyce, 1993). Although there were some missing data, the level of data completion was high due to a committed team. Despite this, it is likely that recording of secondary diagnoses and personality disorders were sometimes overlooked, particularly in outpatients. We did not record a diagnosis of nicotine dependence. Despite these limitations and the problems associated with generalising to other populations we consider that the data presented here will contribute to a better understanding of appropriate benchmarks for perinatal psychiatric services.

These findings highlight the considerable psychiatric need of perinatal women. The concept of postnatal depression, is, perhaps, something of a myth – for most of the women attending our service mood or anxiety disorders were a recurrent, prolonged, and not exclusively puerperal, phenomenon.

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