

needs to be studied in the longer term, and follow up assessment is planned at 12 months post partum.

If this programme was disseminated among and taught to women by physiotherapists, this could result in the promotion of continence in the wider population. Other health professionals such as midwives and primary care physicians could be trained to carry out the different parts of the intervention—midwives immediately after the delivery and physicians or midwives at a postpartum visit.

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Assessing the outcome of compulsory psychiatric treatment in the community: epidemiological study in Western Australia

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Abstract

Objective To examine whether community treatment orders for psychiatric patients reduce subsequent use of health services in comparison with control patients not placed on an order.

Design Epidemiological study with a before and after, two stage design of matching and multivariate analysis, controlling for sociodemographic variables, clinical features, and psychiatric history.

Setting All community based and inpatient psychiatric services in Western Australia, covering a population of 1.7 million people.

Participants 228 subjects placed on a community treatment order, matched with an equal number of controls to give a total of 456 patients.

Main outcome measures Inpatient admissions, bed days, and outpatient contacts one year after subjects were placed on a community treatment order or the index date of matched controls.

Results Both subjects and their matched controls had reduced inpatient admissions and bed days in hospital. Subjects had significantly more outpatient contacts. Multivariate analysis indicated that being placed on a community treatment order was associated with increased outpatient contacts in the subsequent year compared with the control group. Otherwise, orders did not affect subsequent use of health services. Other factors associated with increased use of health services were age and inpatient admissions, bed days, and outpatient contacts before the order or index date. No covariates were shown to be associated with changes

in within pair differences in inpatient admissions or bed days.

Conclusions The introduction of compulsory treatment in the community does not lead to reduced use of health services.

Introduction

Enforcing psychiatric treatment in the community has become a feature in Australia, New Zealand, the United Kingdom, and the United States.¹⁻³ In the United States more than half the states have some form of compulsory community treatment,² and in Australasia similar provisions exist in Victoria, Western Australia, New South Wales, and New Zealand.³⁻⁵ Initiatives in the United Kingdom have included extended leave for patients leaving hospital and the supervision register.^{6,7} The recent white paper *Reforming the Mental Health Act* contains provisions for compulsory treatment in the community.⁸ Studies indicating limited but improved outcomes in terms of readmission to hospital, length of stay, and adherence to treatment have often not controlled for selection bias, variations in treatment, and differing criteria for compulsory treatment in the community.³

The new Mental Health Act of Western Australia, implemented in 1997, includes the provision of involuntary treatment in the community through the introduction of a community treatment order. The aim of our study was to compare the rate of inpatient admissions, bed days, and outpatient contacts of patients one year before and one year after placement on a community treatment order.

Methods

We compared data for subjects placed on a community treatment order with those for a matched control group and then entered them into a multiple regression equation to examine variables predicting the use of health services after placement on an order. The purpose was to identify similar patients not placed on an order as matched controls and examine whether keeping patient characteristics constant could contribute to similar outcomes for inpatient admissions, bed days, and outpatient contacts in the year before the index date.

The Mental Health Information System was linked to a database administered by the Mental Health Review Board in terms of involuntary admissions under the Mental Health Act. This enabled us to include all patients who had been made subject to a community treatment order for the entire state of Western Australia.

Selection of subjects—We selected patients placed on orders between 13 November 1997 (the date of implementation of the Mental Health Act 1996) and 31 November 1998. Of the 313 patients who were preliminarily selected, seven died during the one year observation period after their index dates and 32 had not had a full year's contact with the mental health registry before their index dates, leaving 274 subjects.

Selection of matched controls—We selected 266 controls matched for sex; Aboriginal ethnicity; age; diagnosis at index date; length of stay; number of hospital admissions; occasions of service use; and involuntary status in the year before the index date. Suitable matched controls could not be identified for 38 subjects, leaving 228 patients in each group.

Analysis—We used the paired samples *t* test to test for differences between subjects and controls. We performed each analysis on the logarithmically transformed dependent variables. To further adjust for possible differences between the two groups, we generated standard multiple regression models to examine the contribution of patient characteristics and use of services before the index date to subsequent inpatient admissions, inpatient bed days, and outpatient contacts. We examined predictor variables for each regression model by entering service use, including inpatient admissions, bed days, and outpatient contacts, before the index date and data on patient characteristics such as age, sex, Aboriginal ethnicity, and whether subject or control. We also used a multiple linear regression model to further assess within pair differences in use of health services before and after the index date, with adjustment for possible confounders.⁹

Results

Use of health services before the index date—Comparisons between subjects and controls revealed no significant differences in admissions before the index date (mean paired percentage difference -1.0 , 95% confidence interval -2.3 to 0.3). Inpatient bed days (3.9 , 1.4 to 6.4) and outpatient contacts (32.7 , 26.6 to 38.8) were significantly higher for subjects than for controls.

Use of health services before and after the index date—Inpatient admissions and bed days decreased for both subjects and controls. Outpatient contacts increased for subjects only (table 1).

Table 1 Paired samples *t* tests on transformed inpatient admissions, bed days, and outpatient contacts for subjects placed on a community treatment order and matched controls

| | Before index date (median)* | After index date (median)* | Mean paired percentage differences† (95% CI) |
|-------------------------|--------------------------------|-------------------------------|---|
| Subjects | | | |
| Admissions | 1 | 1 | -30.5 (-36.5 to -24.6) |
| Bed days | 40.5 | 5.5 | -42.2 (-48.6 to -35.8) |
| Contacts | 31 | 46 | 9.1 (5.3 to 12.8) |
| Matched controls | | | |
| Admissions | 1 | 0 | -41.9 (-48.3 to -35.5) |
| Bed days | 35.5 | 3 | -47.5 (-53.9 to -41.0) |
| Contacts | 16 | 17 | -0.1 (-0.6 to 0.3) |

*Medians calculated on the basis of values of variables before logarithmic transformation.

†Percentage differences with logarithms to the base *e* (year before index date as base).

Predicting inpatient bed days after the index date—Significant predictors of bed days within the model included age, admissions, and inpatient bed days before the index date (table 2). Group membership (subject versus control) did not significantly predict subsequent inpatient bed days.

Predicting inpatient admissions after the index date—Admissions and outpatient contacts before the index date were significant predictors of subsequent admissions (table 2). Aboriginal people showed a trend to be admitted more frequently than non-Aboriginal people. Community treatment order status did not significantly predict subsequent inpatient admissions.

Predicting outpatient contacts after the index date—Outpatient contacts before the index date and being placed on a community treatment order were associated with significantly higher subsequent outpatient contacts (table 2). Residential location showed a tendency for more outpatient contacts to occur in metropolitan areas than in rural or remote areas of Western Australia.

Within pair differences—We assessed the effects of placement on a community treatment order on inpatient admissions and bed days over the year before and after the index date by using multiple regression models with within pair differences as dependent variables. No covariates were shown to be associated with the within pair differences in inpatient admissions and bed days, and no variation in results was seen after adjustment for covariates (age, Aboriginal ethnicity, diagnosis type, marital status, occupation, region).

Table 2 Results of regression models with inpatient bed days, admissions, and outpatient contacts after the index date as dependent variables*

| | Unstandardised coefficients (SE) | T value | P value |
|--|-------------------------------------|---------|----------|
| Inpatient bed days after index date | | | |
| Admissions before index date | 0.64 (0.178) | 3.591 | <0.00005 |
| Inpatient bed days before index date | 0.19 (0.073) | 2.661 | 0.008 |
| Age (in years) | -0.02 (0.008) | -2.057 | 0.040 |
| Inpatient admissions after index date | | | |
| Admissions before index date | 0.37 (0.050) | 6.202 | <0.00005 |
| Outpatient contacts before index date | 0.08 (0.020) | 3.872 | <0.00005 |
| Outpatient contacts after index date | | | |
| Outpatient contacts before index date | 0.69 (0.039) | 17.544 | <0.00005 |
| Placement on community treatment order | -0.51 (0.113) | -4.534 | <0.00005 |

*Explained variances for the three models are 12% ($R^2=0.118$, $F=3.42$, $P<0.005$), 19% ($R^2=0.186$, $F=5.86$, $P<0.005$), and 55% ($R^2=0.548$, $F=31.11$, $P<0.005$). Only statistically significant factors are presented. Non-significant factors were sex, marital status, Aboriginal ethnicity, diagnostic category, level of education, location of residence, and profession.

What is already known on this topic

Various forms of compulsory treatment in the community have been suggested as being effective in reducing use of services by patients with mental health disorders

Studies have often lacked epidemiological sampling frames and control for possible confounding factors

What this study adds

Patients placed on community treatment orders and those not on such orders had reduced hospital admissions and bed days one year later

Placement of an order did not predict subsequent use of services

Community treatment orders may not be an effective alternative to assertive community treatment programmes

Discussion

Limitations of the study

Although the matching process allowed selection of controls with similar characteristics to the patients placed on community treatment orders, significant differences in prior outpatient contacts and inpatient bed days existed. This meant that these variables had to be included in the regression models to control for their effects. Controlling for variables, however, may not be sufficient, and additional confounders may be present. For example, it was not possible to control for variables such as social disability or dangerousness with the available database. Patients placed on an order may have greater degrees of dangerousness or social disability. These factors, in turn, may effect subsequent use of health services.

Both groups showed a reduction in inpatient bed days, suggesting a regression to the mean in that patients with high rates of use will have lower rates of subsequent use. The finding that this effect was seen equally in both groups may indicate that the groups were similar. The regression results for within pair differences in inpatient admissions or bed days, and their covariates, also showed the similarity of the two groups. In addition, the design permitted a before and after comparison of subjects and controls.

Are community treatment orders effective?

This study provides mixed results. Although orders reduce admission rates and bed days, the effect is no greater than that seen in a group of patients who are not on such an order, after adjustment for possible confounders. The study therefore raises questions about the effectiveness of such an invasive procedure as enforcing treatment in the community. If efficacy is in part defined by reduced hospital admissions and length of stay, our results suggest that the policy is no more effective than not enforcing community treatment. Our results are consistent with previous studies of community treatment orders, which showed no significant improvements in outcome compared with matched controls,^{10 11} but not with findings from

England and Massachusetts, where patients on "extended leave" or involuntary outpatient treatment spent less time in hospital than did matched controls.^{6 11} Possible explanations might be differing selection criteria and the fact that only age, sex, and diagnosis were controlled for in the design of both these studies. On the other hand, the British study included an assessment of dangerousness that was not recorded in the Western Australia Mental Health Information System.

This study examines only whether community treatment orders reduce immediate use of health services, as this has been the main reason for their introduction and hence the focus of previous research into their effectiveness.⁶ Such orders may reduce use of health services in the longer term or produce benefits in other areas, such as psychosocial functioning.

Some researchers have called for randomised assignment of patients to community treatment orders as a way of measuring the efficacy within a quasi-experimental paradigm,¹² but this can be logistically difficult if the order is tied to statutory legislation. An alternative would be to compare patients from jurisdictions with and without community treatment orders and matched on sociodemographic, clinical, and health service characteristics.

This study shows that legislative solutions such as community treatment orders may not always offer a solution to the need to provide appropriate services for psychiatric patients within limited resources. It is important to examine what role such orders have in providing effective mental health treatment and whether therapeutic gains could be better delivered by enhancing the quality and assertiveness of community treatment for high risk patients.

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