Research in Developmental Disabilities 34 (2013) 4062–4072

Contents lists available at ScienceDirect

Research in Developmental Disabilities

Acute inpatient treatment, hospitalization course and direct costs in bipolar patients with intellectual disability

Chi-Shin Wu [a,b], Pushpal Desarkar [c,d], Anna Palucka [c,d], Yona Lunsky [c,d], Shi-Kai Liu [c,d,*]

[a] Department of Psychiatry, Far Eastern Memorial Hospital, New Taipei City, Taiwan
[b] Graduate Institute of Epidemiology and Preventive Medicine, College of Public Health, National Taiwan University, Taipei, Taiwan
[c] Centre for Addiction for Addiction and Mental Health, Toronto, Ontario, Canada
[d] Department of Psychiatry, University of Toronto, Ontario, Canada

ARTICLE INFO

Article history:
Received 16 July 2013
Accepted 20 August 2013
Available online 18 September 2013

Keywords:
Bipolar disorder (BD)
Intellectual disability (ID)
Length of stay
Psychotropic medication
Hospitalization costs

ABSTRACT

To explore the impacts of intellectual disability (ID) on psychotropic medication use, length of hospital stay (LOS) and direct hospitalization costs during inpatient treatment for acute bipolar episodes, all 17,899 index hospitalizations due to acute bipolar episodes between 1998 and 2007 in Taiwan were identified from a total population health insurance claims database, amongst which 544 subjects had a concomitant diagnosis of ID. Pattern of psychotropic medication use, LOS, discharge outcome and direct costs during hospitalization were compared between bipolar patients with ID and without ID and multivariate models controlling for major cost confounders were used to explore the impacts of ID on LOS, discharge outcome and inpatient costs. The results indicated that, compared to bipolar patients without ID, bipolar patients with ID were younger, had longer LOS and received significantly lower daily equivalent dosages of antipsychotics, mood stabilizers, lithium and benzodiazepines. Significantly more bipolar patients with ID could not be discharged successfully. The longer LOS possibly reflected slower clinical stabilization, conservative use of medications and difficulty in community placement. The lower average daily reimbursements indicated that treatment of bipolar patients with ID were under-funded, whereas the higher total direct costs resulting from prolonged LOS placed greater economic straint on healthcare system. The findings support that bipolar patients with ID are clinically unique but relatively under-supported during acute hospitalization. Modifying current pharmacological intervention, health care resources allocation and community supporting structure is paramount to reducing LOS and improving hospitalization outcome.

1. Introduction

Bipolar disorder (BD) is characterized by its chronic recurrent course. Treating acute episodes and preventing relapses in bipolar disorder is costly. In the US privately insured system, bipolar disorder is the most expensive mental health care diagnosis compared to other disorders (Peele, Xu, & Kupfer, 2003). In the publicly funded UK National Health Service (NHS), the total annual direct medical cost of bipolar disorder treatment was estimated to be £342 million in 2009–2010, amongst which hospitalization accounted for 60%, outpatient and community mental health for 26.7%, and medication in primary

* Corresponding author at: 1001 Queen Street West, Toronto, Ontario, Canada M6J 1H4. Tel.: +1 416 5358501x2817; fax: +1 416 5831268.
E-mail addresses: shi-kai_liu@camh.net, formosaotto@gmail.com (S.-K. Liu).

0891-4222/$ – see front matter © 2013 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.ridd.2013.08.035

care only for 7.4% (Young, Rigney, Shaw, Emmas, & Thompson, 2011). The corresponding figures in the US Medicaid system are 35%, 16% and 13%, respectively (Guo, Keck, Li, Jang, & Kelton, 2008). The cost structure clearly demonstrates that inpatient hospitalization constitutes the bulk of direct health care expenses in the treatment of bipolar disorder (Strydom et al., 2010). Shortening the hospitalization course by improving inpatient treatment and optimizing supports to facilitate discharge back to the community can help ease the economic strain on health care system.

Individuals with intellectual disability (ID) suffer from mood or bipolar disorders at a comparable or even higher rate than general population (Hurley, 2006; Morgan, Leonard, Bourke, & Jablensky, 2008); such dually diagnosed individuals are often more functionally impaired and require more health needs support than those without ID (Lin, Yen, Li, & Wu, 2005; Morgan et al., 2008). As hospitalizations are often required in managing acute episodes of bipolar disorders (de Zelicourt et al., 2003), with estimated prevalence rates at 1.04% for ID (Maulik, Mascarenhas, Mathers, Dua, & Saxena, 2011) and 3–5.84% for bipolar disorders among the general population (de Zelicourt et al., 2003; Hoertel, Le Strat, Angst, & Dubertret, 2013), a substantial number of individuals dually diagnosed with bipolar disorders and ID will be hospitalized due to acute bipolar episodes some time during their course. With complexity in clinical manifestations and diagnosis, increased needs for interdisciplinary collaborative intervention and difficulties in community placement associated with ID (Hurley, 2006; Lunsky & Balogh, 2010), ID can complicate inpatient assessment and treatment and cause prolonged hospitalization in bipolar disorders.

Diagnostically, given limited behavioural repertoire, cognitive capacity and communication ability to elaborate mood symptoms accurately, bipolar patients with ID (BD-ID) may present with atypical clinical manifestations, causing difficulties in confirming the diagnosis of BD. Especially in those with severe to profound ID (Matson, Gonzalez, Terlonge, Thorson, & Laud, 2007), the diagnosis has to rely heavily on identifying "behavioural equivalents" of mood symptoms (Myrbakk & von Tetzchner, 2008; Sturmey, Laud, Cooper, Matson, & Fodstad, 2010), which is often complicated when there are background behavioural disturbances (Hurley, 2008). In addition, agitation and behavioural disturbances can be caused by pain, undetected medical conditions, and co-morbid psychiatric disorders (Tsiouris, Cohen, Patti, & Korosh, 2003). Longer clinical observation and intense medical investigations are often required to disentangle the clinical complexity and hence will prolong the course of hospitalization in individuals with BD-ID.

Likewise, ID might impact pharmacological intervention for BD-ID patients, since individuals with ID are more vulnerable to medication side effects (Lott et al., 2004) and prone to metabolic abnormalities associated with sedentary life styles (de Winter, Bastiaanse, Hilgenkamp, Evenhuis, & Echteld, 2012; Draheim, Williams, & McCubbin, 2002) and/or medication use (Connolly & Thase, 2011; "International Consensus Group on the evidence-based pharmacologic treatment of bipolar I and II depression," 2008; Tamayo, Zarate, Vieta, Vazquez, & Tohen, 2010). The concern about metabolic abnormalities becomes even more pertinent as second generation antipsychotics (SGA) are increasingly used as first line treatment both for acute and maintenance treatments of bipolar disorders—a recent UK study demonstrated that 75% of medication costs were spent on SGA, in contrast to 3.83% on mood stabilizers and 7.11% on antiepileptic medications (Young et al., 2011). Correspondingly, guidelines for pharmacological treatment in individuals with ID have emphasized judicious choice of medication and dosage (Deb et al., 2009; Handen & Gilchrist, 2006). In clinical practice, such vigilance to increased likelihood of side effects will likely result in lower starting dosage and slower titrating process, hence prolong the inpatient treatment course.

Despite such clinical import, the impacts of a diagnosis of ID on pharmacological interventions, treatment course and outcome of acute hospitalization in bipolar disorders has not been systemically examined. Hence, the current study aimed to elucidate the particular demographic/clinical characteristics, psychotropic medication use pattern, hospitalization course and discharge outcome in bipolar patients with concomitant ID to inform further health care delivery. Also, the direct costs during hospitalization were calculated to illustrate the financial impacts of ID on managed care administration (Strydom et al., 2010). By using a national total population health claims database—the National Health Insurance Research Data, Taiwan (NHIRD)—all inpatient hospitalizations for BD-ID between 1998 and 2007 in Taiwan were identified. By comparing bipolar patients with ID (BD-ID) and without ID (BD-C) on key inpatient medication treatments and direct health care expenditures, we expected that individuals with BD-ID would have longer hospital stay (LOS) because of higher clinical complexity and support needs. Also, psychotropic medication use in BD-ID patients would be more conservative than that in BD-C subjects. Overall, the inpatient treatment for patients with BD-ID would be more expensive as reflected by higher average daily and total direct inpatient costs.

2. Method

2.1. NHIRD database/inclusion criteria

Taiwan adopted a compulsory single-payer National Health Insurance (NHI) programme in 1995. In 2007, 22.6 million Taiwanese (99.8% of the total population) had been enrolled in the NHI. Updated complete NHI claims data were compiled as the National Health Insurance Research Database (NHIRD). The NHIRD keeps complete records of beneficiaries' demographic characteristics, context of medical contacts, ICD 9-CM clinical diagnoses, as well as all medical expenditures and prescription claims associated with outpatient visit and inpatient hospitalization. Specifically, the prescription claims data provide complete information about type/dosage of medication, time/frequency of prescription, and amount/duration of drug supply. The NHIRD has been used for various studies in mental health in Taiwan, including intellectual disability (Lai, Hung, Lin, Chien, & Lin, 2011) and bipolar disorders (Tang et al., 2010).