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Research report

An estimate of the minimum economic burden of bipolar I and II disorders in the United States: 2009

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ABSTRACT

Objective: To conduct an analysis yielding estimates of the direct and indirect costs accruing from bipolar I and II disorders in 2009. The last analysis of these costs pertained to 1991.
Methods: The analysis presented is based on recent epidemiological data, a measure of the increase in the cost of health care services and commodities between 1991 and December 31, 2009, a measure of the increase in the cost of living after partialing out of the costs of health care between 1991 and December 31, 2009 and adjustment for growth in the population of the United States between 1991 and 2009 to calculate the direct and indirect costs of bipolar I and II disorders.
Results: The estimated direct and indirect costs of bipolar I and II disorders in 2009 were 30.7 and 120.3 billion dollars, respectively. The estimated total economic burden imposed by these disorders was 151.0 billion dollars. The increase in costs between 1991 and 2009 was not entirely due to inflation. Bipolar I and II disorders are now estimated to have a combined prevalence exceeding that used in the calculation of costs for 1991 by 1.6154-fold. Direct costs escalated out of proportion (2.2393-fold) to indirect costs (1.6148-fold).
Limitations: The analysis required the acceptance assumptions that likely resulted in a net-underestimation of costs and did not take the entirety of the bipolar spectrum into account.
Conclusions: The findings have implications for the formulation of public policy. The lifetime prevalences of not only bipolar I and II disorders but also the high prevalence of the entire body of bipolar spectrum disorders, the suffering that they create and the economic burden imposed by them render them worthy of having a high priority in the formulation of plans for the delivery of health care services, planning educational programs for the public and informing policymakers.

1. Introduction

Goodwin and Jamison (2007) reviewed the literature pertaining to the age of onset of bipolar disorder among 4,494 subjects in clinical samples published since 1990. The weighted mean age of onset was 22.2 years. However, prodromal symptoms that stand to substantially interfere with function often appear during childhood or adolescence (Akiskal et al., 1985; Shaw et al., 2005). These can prevent the fulfillment of educational and occupational potential and thus have lifelong economic consequences.

Bipolar disorder was the sixth leading cause of disability worldwide among persons between the ages of 15 and 44 years of age according to a 1996 World Health Organization (WHO) report (Murray and Lopez, 1996). Consequently, it is only rational to assume that in the formulation of policy that the bipolar spectrum disorders impose an immense burden financially both to their immediate victims and society at large.

Wyatt and Henter (1995) conducted, to the best of the author's knowledge, the last formal analysis of the economic burden of bipolar I and II disorders. The estimate pertained to

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calendar year 1991. The estimated sum of the direct and indirect costs was 45 billion dollars. The direct costs were estimated to be 7 billion dollars. Indirect costs were estimated to be 38 billion dollars or 84.4% of the total economic burden. The purpose of this report is to provide an estimate of the total of the direct and indirect costs of bipolar I and II disorders in 2009.

The analysis by Wyatt and Henter (1995) was based on several assumptions, all of which, for the purpose of this report, save one will be accepted as being valid. The lifetime prevalences of bipolar I and II disorders were estimated to be 0.8 and 0.5%, respectively in the Epidemiological Catchment Area Survey (Regier et al., 1984; Regier et al., 1990). These figures, which were the best estimates of the lifetime prevalences of bipolar I and II disorders, available at the time that the last cost analysis was done, entered into that analysis. For the purpose of the analysis presented here all assumptions, other than that of the lifetime prevalences of bipolar I and II disorders will be regarded to be valid. In the analysis, the lifetime prevalences of bipolar I and II disorders will be based on findings stemming from the National Comorbidity Survey-Replication (NCS-R) (Merikangas et al., 2007).

The estimate of the economic burden of the disorders in question is contingent on the assumption that the direct and indirect costs stemming from both variants sufficiently approximate one another per victim of that variant so as to not materially affect the results. This assumption is reasonably subject to question. The grounds for assuming that the economic burden imposed per individual afflicted with bipolar I and II disorders *sufficiently approximate* one another to be regarded to be the same in the analysis will be reviewed prior to describing the Methods and presenting the Results.

Judd et al. (2008) reported that during a long-term follow-up period (mean = 15.2 years) that participants in NIMH sponsored Collaborative Study on the Psychobiology of Depression (CSD) with bipolar I disorder were significantly more likely to be hospitalized than those with bipolar II disorder (140 versus 89 days). The increase in days of hospitalization occurred over the span of an average of 15.2 years. It follows that the mean difference in the days of hospitalization among the subjects with bipolar I disorder was 3.36 days more per annum than those with bipolar II disorder. Consequently, the increase in direct costs associated with bipolar I disorder stemming from an increase in the number of days of hospitalization in any given year is less than one might initially suppose. Nonetheless, hospitalization is costly and it is reasonable to suppose that there are greater direct costs associated with bipolar I than II disorder per person victimized. However, it is critical to highlight the finding that in 1991 that the combined direct costs of these disorders came to only 15.6% of the total economic burden imposed by them; *consequently* one could reasonably conduct the analysis anticipating that slightly higher direct costs accruing per person afflicted with the former would likely immaterially impact on the outcome of the analysis. Other considerations also support this perspective.

There was no difference in the mean age of onset of the subjects with bipolar I and II disorder or in their mean age at entry into the CSD. A difference in age of onset or age at entry into the Study would indicate a difference in the duration of illness. A longer duration of illness among subjects in either group might impact on both direct and indirect costs as it could be related to a lengthier period of treatment and impairment of function.

Judd et al. (2003a and b) reported that individuals with bipolar II disorder were prescribed less somatic treatments during and between episodes than those with bipolar I disorder. In contrast, in another study Judd and Akiskal (2003c) found that there is not a global difference in the utilization of health care services by individuals with bipolar I and II disorders. The latter finding reduces concern that there is a *meaningful difference* in the direct costs within a given time frame per person afflicted with bipolar I relative to bipolar II disorder stemming from the use of outpatient services. All factors considered, the author concludes that for the purpose of calculating the direct costs stemming from bipolar I and II disorders, that it is reasonable to assume that the direct costs of these disorders sufficiently approximate one another per individual afflicted to reasonably allow the two groups to be combined for the purpose of the analysis.

Judd and colleagues found, in other studies, that during a long-term follow-up period using the CSD database that bipolar I (Judd et al., 2002) and II (Judd et al., 2003c) subjects were symptomatic an average 47.3% and 53.9% of the weeks yearly, respectively. This difference is fundamentally due to the increased depressive burden associated with bipolar II disorder. This raises the possibility that given the heavier depressive burden of bipolar II disorder that the indirect costs accruing form it could be slightly greater than that those stemming from bipolar I disorder. However, the author knows of no data supporting this perspective.

There is no evidence, to the best of the author's knowledge, indicating that the indirect costs of bipolar I and II disorders differ per individual afflicted stemming from impairment of psychosocial, including work function (Judd et al., 2008). Psychosocial function did not differ between the two disorders over the 15.2 year follow-up period in the CSD (Judd et al., 2008; Judd et al., 2005). Lastly, and very importantly Judd and Akiskal (2003) reported that individuals with bipolar I and II disorders in the ECA database were equally likely to require welfare and disability benefits. Thus, all factors considered it is reasonable to assume that with respect to these highly costly endpoints that the indirect costs related to the two disorders are similar to one another per victim afflicted.

2. Methods

2.1. Epidemiological data

The lifetime prevalences of bipolar I and II disorders are estimated to be 1.0 and 1.1%, respectively using the NCS-R database (Merikangas et al. 2007). Wyatt and Henter (1995) assumed that the prevalences of these disorders are 0.8 and 0.3%, respectively. The ratio of 2.1 to 1.3 = 1.6154. This figure will be used in the calculation of the estimated direct and indirect costs accruing from them.

2.2. Increase in health care costs between 1991 and 2010

The index used to measure the increase in the cost of health care between January 1, 1991 and December 31, 2009 is the Consumer Price Index: All Urban Consumers (CPI-U) for Medical Care. The data are available on request from the