Sex Differences in the Age of Onset of Bipolar Affective Illness

CHARLES D. T. SIBISI

Data from a UK national sample showed differences between the sexes in age-specific inception rates for mania. Women had a higher inception rate than men during the middle years. The cumulative admission rates were nearly equal between the sexes.

The age of onset of bipolar affective illness has been determined by several investigators. These may be divided into two groups, on the basis of the results obtained. The first group found that the distribution of the age of onset of bipolar affective illness peaks in early adult life (late teens and 20s) and thereafter declines with age (Winokur et al., 1969; Angst et al., 1973; Carlson et al., 1974; Loranger & Levine, 1978; Pettersson, 1977; Joyce, 1984). The second group (Spicer et al., 1973; Eagles & Whalley, 1985), using national figures for first admissions, came to the conclusion that the inception rate for mania increases with age and peaks in late life.

The discrepancy could arise for two reasons. Firstly, the methodologies were different. The former studies were on relatively well defined patient populations, whereas the latter were based on the numbers of patients admitted to hospitals in England and Scotland with a diagnosis of mania. The advantage gained in basing a distribution of age of onset upon a large number of patients is mitigated by the uncertainty regarding diagnostic accuracy and consistency, which is inherent in data pooled from various hospitals and units.

The second reason has to do with fundamental considerations regarding the concept of age of onset of a condition with variable onset such as bipolar affective illness. The former studies were based upon the observed age of onset of bipolar illness. This is obtained by simply noting the age of onset of a consecutive series of patients. The sample so obtained will contain an excess of individuals with early onset, if only because early-onset individuals would be expected, on average, to live longer after onset than those whose illness begins in old age. Thus, if we learn that a sample of patients with bipolar illness (or any other illness) has an individual whose illness started, say, over 50 years previously, we can conclude that the person concerned had onset in early life. On the other hand, someone whose illness started a year previously is just as likely to have had onset at age 20 as at 70. The time between onset and index admission for early-onset bipolar patients would therefore be expected to vary much more than that in the late-onset group. The data of Winokur et al. (1969) lends support to this hypothesis. Twenty of their 61 patients with bipolar illness had onset before age 20. The differences between the ages at onset and at index episode for each of the 20 patients ranged from 0 to 33, with a mean of 9.7 years. The corresponding figures for the six patients with onset after age 50 were a range of 0 to 14 and a mean of 3.8 years.

It is therefore necessary to restrict the sample to patients whose illness started at the same time, thereby ensuring that all have an equal chance of being included in the sample, irrespective of age of onset. Another reason that any sample of bipolar patients might contain an excess of early-onset cases is that younger people outnumber older people in the general population. In order to obtain a meaningful estimate of the probability of developing symptoms at a given age, it is necessary to determine the age-specific inception rate, as Eagles & Whalley (1985) and Spicer et al. (1973) have done.

Previous studies on the sex differences in bipolar affective illness have yielded an excess of women relative to men (sex ratio approximately 1.3 : 1) and a lower mean age of onset in women compared with men, although the differences do not reach statistical significance (Perris, 1968; Gershon et al., 1975; Pettersson, 1977; Loranger & Levine, 1978; Angst et al., 1980; Joyce, 1984). Baron & Risch (1983) found a later mean age of onset in women. These findings are intriguing, as they are mostly based on the observed age at onset. The population age distribution of women is different from that of men, with a preponderance of elderly women over men. If there were no differences between the sexes in the age-specific inception rate of bipolar illness, one would expect differences in the observed age at onset, and vice versa. There is a possibility that differences between the sexes in age of onset of bipolar illness have not been highlighted because studies have been based on the observed age at onset.
The object of this study was to determine whether there are any differences between the sexes in the age of onset of bipolar affective illness, using data from a national sample.

**Method**

Psychiatric hospitals and units in England are required to submit information, including diagnosis, age, and sex, about in-patients to the Department of Health. The information is collated and stored at Norcross, Blackpool, under the heading "The Mental Health Enquiry" and forms the basis for the annual Inpatient Statistics from the Mental Health Enquiry, published by Her Majesty's Stationery Office. The diagnoses are coded according to the latest edition of the World Health Organization's International Classification of Diseases. Since 1980 ICD-9 has been used (World Health Organization, 1978). Unpublished data from the Mental Health Enquiry were made available to the author by the Department of Health and these form the basis of this article. This is the same type of data as used by Eagles & Whalley (1985) and Spicer et al (1973).

**Results**

The number of first admissions, by age and sex, for ICD-9 category 296.0 manic-depressive psychosis, manic type, for the years 1982–86 inclusive, was noted. The age-specific inception rate (new admissions per million of the population for each five-year age interval) was computed (Table I).

<table>
<thead>
<tr>
<th>Age interval</th>
<th>No. of first admissions</th>
<th>Population of England and Wales (x 1000)</th>
<th>Inception rate per million per year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>female</td>
<td>male</td>
<td>female</td>
</tr>
<tr>
<td>10–14</td>
<td>0</td>
<td>0.6</td>
<td>1711.8</td>
</tr>
<tr>
<td>15–19</td>
<td>24.6</td>
<td>25.6</td>
<td>1967.8</td>
</tr>
<tr>
<td>20–24</td>
<td>56.2</td>
<td>55.8</td>
<td>1994.2</td>
</tr>
<tr>
<td>25–29</td>
<td>53.2</td>
<td>49.4</td>
<td>1744.4</td>
</tr>
<tr>
<td>30–34</td>
<td>47.4</td>
<td>37.4</td>
<td>1683.4</td>
</tr>
<tr>
<td>35–39</td>
<td>47.2</td>
<td>36.4</td>
<td>1800.6</td>
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<tr>
<td>40–44</td>
<td>44.8</td>
<td>28.6</td>
<td>1470.8</td>
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<tr>
<td>45–49</td>
<td>43.0</td>
<td>28.0</td>
<td>1375.8</td>
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<td>50–54</td>
<td>34.2</td>
<td>25.2</td>
<td>1360.4</td>
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<td>55–59</td>
<td>33.6</td>
<td>28.0</td>
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<tr>
<td>60–64</td>
<td>33.4</td>
<td>22.8</td>
<td>1471.4</td>
</tr>
<tr>
<td>65–69</td>
<td>30.2</td>
<td>22.8</td>
<td>1253.6</td>
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<tr>
<td>70–74</td>
<td>31.4</td>
<td>20.0</td>
<td>1227.8</td>
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<td>75–79</td>
<td>27.6</td>
<td>15.6</td>
<td>997.8</td>
</tr>
<tr>
<td>80–84</td>
<td>14.0</td>
<td>8.8</td>
<td>657.6</td>
</tr>
<tr>
<td>85+</td>
<td>11.2</td>
<td>3.8</td>
<td>456.6</td>
</tr>
<tr>
<td>Total</td>
<td>532.0</td>
<td>408.8</td>
<td>–</td>
</tr>
</tbody>
</table>

A two-way analysis of variance was performed. There were differences between the sexes in age-specific inception rate ($F = 6.54, P < 0.05$) but no significant year-on-year differences. The female : male ratio in age-specific inception rate was noted, and the following observations made.

(a) The ratio of cumulative inception rates was (women : men) 1.14. The ratio in numbers of admissions (i.e. before adjustment for the population age structure) was 1.30. This suggests that failure to take population age differences into account results in an overestimate of the overall female : male ratio.

(b) In early life, the inception rate for men and women is nearly equal. The female preponderance reaches a peak in middle life and thereafter declines (Fig. 1). The female : male ratio varies from 1.59 to 0.88; however, none of the points on the curve lies outside the 5% confidence intervals from the regression line.

**Discussion**

Information from the Mental Health Enquiry has a number of drawbacks. It is not comprehensive; approximately 15% of psychiatric hospitals and units fail to submit information. In many cases the ICD codes are assigned by clerical staff at the Department of Health, Norcross, Blackpool, on the basis of the information on the forms, rather than by the clinicians treating the patients (personal observation). There is often insufficient information to permit exhaustive categorisation. The largest categories often comprise miscellaneous cases that are difficult to classify, for example 311.9, depressive disorder not elsewhere classified. The resulting loss of information will vary according to the illness under study. It would be expected to be smaller in the case of mania than in depression (there is no category 'mania not elsewhere classified' outside the category of affective...

![Fig. 1](image_url)  
**Fig. 1** Female : male ratios of age-specific inception rates.
psychosis). The category manic–depressive psychosis other and unspecified (296.6–296.9) probably includes some cases of mania as well as depressive and mixed affective states. The frequency of these categories in the Mental Health Enquiry is about half that of 296.0, manic–depressive psychosis, manic type. In contrast, the frequency of 311.9, depressive disorder not elsewhere classified, is half as much again as 296.1, manic–depressive psychosis, depressed type, and 300.4, depressive neurosis, together. The distribution of ages at first admission would be affected by misclassification if the latter is an age-dependent phenomenon, that is if patients of a certain age at first admission are more likely to receive a diagnosis other than manic psychosis (296.0) or other and unspecified (296.6–296.9) than those with later onset.

The study of Spicer et al (1973) yielded results that support the conclusions of the present study regarding the age variation in sex differences in inception rate for mania. Eagles & Whalley (1985) did not find sex differences in age at onset, but their sample was smaller.

The aetiology of bipolar affective illness is probably multifactorial, with contributions from genetic, biological, and psychosocial factors. Examination of the distribution of age of onset leads to speculation about some of the factors that precipitate symptoms. Absence of illness before puberty has been noted by several writers (Anthony & Scott, 1960; Crowe & Smouse, 1977; Loranger & Levine, 1978; Joyce 1984) and suggests a role for hormonal factors. It is interesting to note that the cumulative inception rate for manic episodes (unpublished data). Twenty-three of the women had had episodes of illness before the first admission, mostly depressive in nature and associated with pregnancy. Ten of the men had had an episode of illness before first admission. This suggests that the incidence rates based on admissions underestimates the female preponderance, at least during the early (reproductive) years.

A large, prospective study, on a well defined patient population, may shed light on sex differences in age of onset (rather than just age of first admission) of bipolar illness, and the factors underlying such differences.

**References**


SEX AND AGE AT ONSET IN MANIC DEPRESSION


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Charles D. T. Sibisi, MB, ChB, MRCPSych, Consultant Psychiatrist, Burton Road Hospital, Burton Road, Dudley, West Midlands DY1 3BX
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C D Sibisi

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