THE SEVERITY OF ALCOHOL WITHDRAWAL IS NOT AGE DEPENDENT

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(Received 19 July 1999; in revised form 29 April 2000; accepted 25 July 2000)

Abstract — Age has been considered to contribute to the severity of the alcohol withdrawal syndrome (AWS). To evaluate the relationship between age and the severity of the AWS, we examined 723 alcoholics [518 males, 205 females, mean age (+ SD): 42.8 ± 10.5 years, mean duration of alcohol dependence: 11.0 ± 8.0 years] consecutively referred to a unit for detoxification of alcoholics in a general hospital. The severity of the AWS was assessed by the AWS scale of Wetterling et al. (1997; Alcohol and Alcoholism 32, 753–760). The history of alcohol abuse as well as drinking behaviour in the last 6 months was assessed by a semi-structured interview. There were 41 alcoholics aged ≥60 years; they were compared with younger patients. The average severity of AWS did not differ between age groups. Daily alcohol intake and frequency of drinking were higher in younger alcoholics, but even when adjustment was made for this, severity of AWS was equal in both age groups. A relationship between severity of AWS and age was not detected.

INTRODUCTION

There is substantial individual variation in the clinical manifestations of alcohol withdrawal, ranging from very mild tremor and irritability to significant autonomic hyperactivity, severe metabolic disturbances, and mental symptoms including hallucinations and confusion (delirium tremens). Mostly because of these latter severe complications, the acute management of the alcohol withdrawal syndrome (AWS) is a clinical challenge (Foy et al., 1988; Jensen et al., 1988; Tonnesen et al., 1992; Wetterling et al., 1994). It appears reasonable to expect a greater risk for a complicated AWS in the elderly due to longer duration of alcohol abuse, higher medical comorbidity, baseline cognitive deficits, and greater sensitivity to drug treatment (Council on Scientific Affairs, 1996; Kraemer et al., 1997). Withdrawal symptom severity is thus presumed to increase with advancing age, leading to longer treatment and consequently longer inpatient care with higher costs. However, a further problem lies in the fact that many acute medical conditions in the elderly may resemble the signs and symptoms of AWS. A careful evaluation of the somatic as well as mental symptomatology therefore is mandatory.

Up until now, there have been only four studies describing the course of the AWS in elderly patients (Liskow et al., 1989; Brower et al., 1994; Foy et al., 1997; Kraemer et al., 1997). Unfortunately, very different measures were used (e.g. scores for the withdrawal symptoms vs the amount and duration of the administered medication vs the length of stay), which did not allow for a comparison between these studies. The studies of Brower et al. (1994) and Liskow et al. (1989) made a comparison of old versus young alcoholics, only using a retrospective design, without validated withdrawal severity measures or structured protocols for medication dosing. With these reservations in mind, these studies could not reveal any clear evidence supporting the hypothesis that alcohol withdrawal-specific symptoms or signs are more severe in the elderly. Apart from age, several further risk factors for a severe AWS are discussed in the literature (see, e.g., Foy et al., 1994; Wetterling et al., 1994; Kraemer et al., 1999; Wojnar et al., 1999a,b), including quantity and frequency of alcohol intake, number of prior detoxifications, past delirium, and medical comorbidity. There was a lack of prospective studies with a measurement of the course of the withdrawal symptomatology in different age groups. The aim of the present study was therefore to examine prospectively the relationship between age and severity of AWS, while taking into account the role of possible contributing factors.

MATERIALS AND METHODS

The sample was 723 patients [205 females, mean (+ SD) age: 43.7 ± 10.3 years, range: 17–70; and 518 males; mean age: 42.4 ± 10.5 years, range: 18–75] who were consecutive admissions to a ward of a general university hospital specialized for the detoxification of alcoholics without acute internal or surgical disorders, and who gave informed consent. The sample was divided into three age groups (<30, 30–59 and ≥60 years). The alcohol history was assessed through a structured questionnaire (according to guidelines of the German Society for Addiction Research and Therapy), which is similar to the Alcohol Severity Index (ASI) (McLellan et al., 1980). Reliable data on the history of medical disorders (liver diseases, pancreatitis, gastritis, gastric or duodenal ulcer, pneumonia, diabetes, hypertension, heart disease or brain trauma) were available for only 263 patients.

The severity of the alcohol withdrawal syndrome was assessed by trained nurses using the AWS scale (Wetterling et al., 1997). Assessment was made every 4 h for the first 7 days until the AWS score was <4 for more than 24 h. The AWS scale covers most of the DSM-IV items (American Psychiatric Association, 1994) for alcohol withdrawal including autonomic hyperactivity (sweating, pulse rate >100/min, diastolic blood pressure >95 mmHg), increased hand tremor as well as psychomotor agitation, anxiety, and transient visual, tactile, or auditory hallucinations. Since some of the assessed symptoms, such as hypertension, anxiety etc., are very common and cannot clearly be attributed to AWS, an AWS score ≤3 was classified as non-specific or no alcohol withdrawal. The subjects were divided into the following categories according

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to the maximum AWS score (at any time during the withdrawal): mild: 4-5; moderate: 5-9; severe withdrawal: ≥10; and delirium if additionally the DSM-IV criteria for ‘alcohol withdrawal delirium’ were fulfilled. The subjects were treated by a score-controlled treatment protocol, as described in detail in a previous publication (Wetterling et al., 1997): patients with no or only a mild AWS received no medication, and those with a moderate AWS were prescribed 600-800 mg/day carbamazepine, which was proven to be equally effective as oxazepam (Malcolm et al., 1989; Stuppaec et al., 1992). Subjects with a severe AWS were treated with clomethiazole. In cases of severe hallucinations, haloperidol was given additionally.

Statistical analysis of the results was performed with an SPSS program package (SPSS, Chicago, IL, USA). For general comparison of all age groups, an ANOVA followed by Scheffé’s post-hoc test for multiple comparisons was calculated. A stepwise forward logistic regression model was performed to analyse the influence of possible contributing factors to the severity of AWS. The regression coefficient and the corresponding t- and P-values were calculated. In all tests $P > 0.05$ was considered as not significant.

**Results**

There was a higher rate of no or only mild AWS in the ≤29 year age group than in those ≥30 years ($\chi^2 = 9.3, df = 2, P < 0.01$) and the percentage of patients aged ≥60 years who progressed to withdrawal delirium was not significantly higher than in the younger age groups (≤59 years), although numbers were small ($\chi^2$-test 2.4, df = 2, not significant) (Table 1). Furthermore, the withdrawal severity (maximum AWS score) did not correlate with age (Spearman’s $r = 0.030$, not significant).

There were no significant differences detected between age groups in the maximum total AWS score, the AWS-M score for mental symptoms or the AWS-S score for the somatic symptoms (Table 2). The duration of AWS (defined as the number of days with an AWS score >3) was similar in all age groups and strongly correlated with the withdrawal severity (Spearman’s $r = 0.740, P < 0.0001$). In ~10% of each age group, seizures occurred during withdrawal, mostly (95.8%) within the first 24 h after cessation of drinking alcohol.

The comparison of possible contributing factors revealed no significant differences apart from the expected lower duration of dependence and lower number of prior detoxifications in the age group ≤29 years (Table 3). However, none of the patients aged ≥60 years reported a history of withdrawal delirium, whereas ~10% of the younger ones did. There was a trend towards a lower number of severe concomitant medical disorders in the group aged ≤29 years and towards a higher number in old alcoholics (≥60 years).

There was no correlation between the average amount of alcohol intake/drinking day (mean: 216 g/day; range: 40–840) and the number of drinking days (mean: 24 ± 8) in the last month and the severity of AWS (Spearman’s $r = -0.005$ or $r = -0.0147$, respectively). The mean alcohol consumption/drinking day in the last month tended (non-significantly) to be higher in those aged <60 years (Table 3). However, when adjustment was made for daily alcohol intake and frequency of drinking, no difference of the severity of AWS could be found between the age groups.

Logistic regression revealed no significant influence of age, gender, duration of alcohol dependence, drinking pattern, average alcohol intake per drinking day and prior detoxifications on the occurrence of severe AWS.

### Table 1. Distribution of maximum alcohol withdrawal syndrome (AWS) score (at any point) in relation to age

<table>
<thead>
<tr>
<th>Maximum AWS score</th>
<th>All ages</th>
<th>≤29 years</th>
<th>30–59 years</th>
<th>≥60 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–5 (no or mild AWS)</td>
<td>298 (41.2)</td>
<td>43 (60.6)</td>
<td>237 (38.8)</td>
<td>18 (43.9)</td>
</tr>
<tr>
<td>6–9 (moderate AWS)</td>
<td>264 (36.5)</td>
<td>16 (22.5)</td>
<td>234 (38.3)</td>
<td>14 (34.1)</td>
</tr>
<tr>
<td>≥10 (severe AWS)</td>
<td>100 (13.8)</td>
<td>9 (12.7)</td>
<td>87 (14.2)</td>
<td>4 (9.8)</td>
</tr>
<tr>
<td>Withdrawal delirium</td>
<td>61 (8.4)</td>
<td>3 (4.2)</td>
<td>53 (8.7)</td>
<td>5 (12.2)</td>
</tr>
</tbody>
</table>

All values in parentheses are percentages. $\chi^2 = 14.6, df = 6, P = 0.023$.

### Table 2. Alcohol withdrawal syndrome (AWS) scores, duration of AWS and incidence of withdrawal seizures in relation to age

<table>
<thead>
<tr>
<th>Age</th>
<th>All</th>
<th>≤29 years</th>
<th>30–59 years</th>
<th>≥60 years</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWS max</td>
<td>6.5 ± 3.8</td>
<td>5.7 ± 3.9</td>
<td>6.7 ± 3.8</td>
<td>5.8 ± 4.1</td>
<td>ANOVA, post-hoc</td>
</tr>
<tr>
<td>AWS-S max</td>
<td>4.7 ± 2.7</td>
<td>4.4 ± 3.1</td>
<td>4.8 ± 2.6</td>
<td>3.9 ± 2.6</td>
<td>ANOVA, post-hoc</td>
</tr>
<tr>
<td>AWS-M max</td>
<td>2.0 ± 2.1</td>
<td>1.5 ± 1.3</td>
<td>2.0 ± 2.2</td>
<td>2.1 ± 2.6</td>
<td>ANOVA, post-hoc</td>
</tr>
<tr>
<td>Duration of AWS (days)</td>
<td>2.3 ± 1.8</td>
<td>1.8 ± 1.6</td>
<td>2.3 ± 1.8</td>
<td>1.7 ± 1.5</td>
<td>ANOVA, post-hoc</td>
</tr>
<tr>
<td>Seizure(s) during withdrawal (%)</td>
<td>10.0</td>
<td>7.0</td>
<td>10.3</td>
<td>9.8</td>
<td>$\chi^2$ n.s.</td>
</tr>
</tbody>
</table>

AWS max, total score; AWS-S max, somatic score; AWS-M max, mental score; ANOVA, analysis of variance; n.s., not significant.
DISCUSSION

Our findings are in agreement with those of Kraemer et al. (1997) showing that the maximal withdrawal severity scores of patients referred to a detoxification unit, and amount and duration of medication administered, did not differ significantly with age. However, in this sample, only five patients >60 years old progressed to classic delirium tremens. In contrast to our results, Foy et al. (1997) found that general hospital patients aged >70 years were at increased risk for complications (defined as seizure, delirium, or hallucinations), when compared to younger patients. Our data only showed a trend for patients aged <30 years to be at a lower risk for development of a severe AWS. The differences are probably due to the recruitment procedure of the samples [in medical and surgical wards (Foy et al., 1997) vs in a detoxification unit (this study)].

In the literature (Foy et al., 1997; Wetterling et al., 1994; Kraemer et al., 1999; Palmstierna, 1999; Wojnar et al., 1999a,b) several risk factors for a severe AWS were discussed, namely: (1) quantity and frequency of alcohol intake; (2) past delirium; (3) number of prior detoxifications; (4) medical comorbidity (pneumonia, coronary heart disease, cardiac arrhythmia etc.).

We found no correlation between average amount of reported alcohol intake/day or the number of drinking days in the last month and the severity of AWS, perhaps because the mean alcohol consumption was very high. Furthermore, withdrawal severity was not associated with past withdrawal seizures, past delirium, number of prior detoxifications, medical comorbidity or older age. These findings agree with those of Wojnar et al. (1999a,b), who also found no clear relationship. These data do not support the kindling model (Ballenger et al., 1978).

The proportion of patients developing delirium (8.4%) in our sample was higher than in some other studies (≤5%: Koch-Weser et al., 1976; Turner et al., 1989). This may be due to the closer monitoring in our study (every 4 h), which allows for the detection of even short periods of delirious symptoms, i.e. confusion in the night, which otherwise might pass by undetected.

Though overall severe AWS was not more frequent in older patients, out of nine who had severe AWS, five developed delirium (Table 1), which was not significantly higher than in younger patients. However, delirium is common and multifactorial in the hospitalized elderly, relating to the high prevalence of cognitive impairment which is known to be a risk factor for prolonged delirium (Inouye et al., 1993; Marcantonio et al., 1994), and to the higher frequency of chronic comorbid medical conditions, limited physiological reserve, and adverse effects of drug treatment.

Valid data concerning medical comorbidity were only available in 263 subjects. Despite the higher proportion of subjects suffering from actual comorbid conditions in the group ≥60 years, no clear influence of the number of somatic diseases on the severity of the AWS was detected. However, in a recent study (Wojnar et al., 1999b) the severity and duration of withdrawal delirium correlated with the occurrence of pneumonia, coronary heart disease, alcoholic liver disease and anaemia. Again, these different results may be due to the recruitment procedure of our sample, since severely medically ill persons were sent to the internal medicine or surgical department.

In this study, the patients were treated by a symptom-triggered therapy based on the monitoring of a structured assessment scale, the AWS scale. Until now, similar scales, e.g. the CIWA-Ar (Sullivan et al., 1989), have not been validated in elderly patients. Therefore, there is some criticism that the scales are less specific in the elderly, because other medical conditions and medications may mimic or blunt alcohol withdrawal symptoms. Our results suggest that the AWS scale focused on core symptoms of AWS also provides a reliable evaluation of the withdrawal severity in the elderly. In contrast to another study (Kraemer et al., 1997) reporting that older inpatients undergoing detoxification have to stay longer at hospital, the duration of AWS in our sample was similar across age.

In conclusion, our study did not detect that alcohol withdrawal-specific symptoms or signs were more severe in the elderly than in the younger age groups. Severity of the AWS was not mediated by duration of dependence, drinking pattern, average alcohol intake per drinking day, or prior number of detoxifications.
REFERENCES


