ALCOHOL-RELATED ADMISSIONS TO AN INNER CITY HOSPITAL INTENSIVE CARE UNIT

P. MARIK* and B. MOHEDIN

Division of Critical Care Medicine, Detroit Receiving Hospital and Wayne State University, Rm 5S-10, 4201 St Antoine, Detroit, MI 48201, USA

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Abstract — We investigated the impact of alcohol-related medical emergencies on health care utilization in an inner city hospital medical intensive care unit (ICU). Data from 200 consecutive admissions to the medical ICU were collected prospectively. The major reason for each patient's admission to the ICU was recorded and the causal relationship between alcohol abuse and the admission diagnosis was determined. Clinical and demographic data as well as the insurance status and cost of goods and services delivered were determined for all patients. Twenty-one per cent of all the ICU admissions were directly alcohol-related, with a mean hospital charge of $52,527. The alcohol-withdrawal syndrome was the commonest alcohol-related admission, with a mean ICU stay of 5 days and a mean hospital charge of $21,336. Of the patients with non-alcohol related admission diagnoses, 61% had health insurance, compared to 42% for the patients with alcohol-related admission diagnoses (P < 0.05). Patients with alcohol-related admissions tended to be younger and male. In conclusion, we demonstrated that alcohol-related admissions are common in inner city hospital ICUs and consume considerable hospital resources. The treatment of these patients is costly, with hospitalization being essentially non-curative. In this era of health care reform, more effective primary and secondary preventative measures are required to control this pervasive health care problem.

INTRODUCTION

Alcohol is the most commonly used mind-altering drug worldwide. In the USA, nearly half the population over the age of 12 drink alcohol regularly, with ~10 million, according to one definition, addicted to the agent (Angell and Kassirer, 1994). In 1986 the per capita consumption of ethanol in the USA was calculated to be 2.58 gallons (MMWR, 1989). When this rate is recalculated to exclude the abstaining population, the per capita consumption of drinkers rises dramatically to nearly 7 gallons. Alcohol abuse has an enormous impact on society. In the US alcohol is responsible for ~100,000 deaths yearly, at a cost of about $130 billion (McGinnis and Foege, 1993). Nearly half of all fatal automobile accidents are alcohol-related (Department of Transportation, 1993). In addition alcohol is implicated in the majority of homicides and other acts of violence (Institute for Health Policy, 1993).

No age group or social class is exempt from the effects of alcohol (Smart and Liban, 1981; Adams et al., 1993). However, due to the high incidence of unemployment, overcrowding and social deprivation, alcohol abuse is a major problem in inner city populations (Taylor et al., 1986). Hospitals serving such populations are therefore likely to admit many alcohol-related medical emergencies. The aim of this study was to investigate the impact of alcohol related-medical admissions on health care utilization in an inner city hospital medical intensive care unit (ICU).

MATERIALS AND METHODS

This study was conducted in the Medical Intensive Care Unit at Detroit Receiving Hospital, an inner city hospital in downtown Detroit, Michigan, USA. The study was conducted between December 1992 and January 1993. Data

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Table 1. Comparison of non-alcohol- and alcohol-related ICU admissions

<table>
<thead>
<tr>
<th></th>
<th>Non-alcohol-related (n = 158)</th>
<th>Alcohol-related (n = 42)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>53 ± 1</td>
<td>42 ± 2*</td>
</tr>
<tr>
<td>ICU LOS† (days)</td>
<td>7 ± 1</td>
<td>11 ± 5 (6 days‡)</td>
</tr>
<tr>
<td>Ventilated</td>
<td>88 (55%)</td>
<td>19 (45%)</td>
</tr>
<tr>
<td>Insured</td>
<td>96 (61%)</td>
<td>18 (42%)*</td>
</tr>
<tr>
<td>M:F</td>
<td>1.2:1</td>
<td>4.2:1**</td>
</tr>
<tr>
<td>Died</td>
<td>25 (16%)</td>
<td>9 (21%)</td>
</tr>
<tr>
<td>Cost</td>
<td>$43,136 ± 6,098</td>
<td>$52,527 ± 21,695 ($26,790*)</td>
</tr>
</tbody>
</table>

* P < 0.05; **P < 0.01, for comparison between groups.
† LOS = length of stay; ‡excluding three long stay patients. Age, LOS and cost are given as means ±SEM.

Table 2. Clinical data of alcohol-related admissions

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>No.</th>
<th>M:F</th>
<th>LOS†</th>
<th>Cost (US$)</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol withdrawal</td>
<td>22</td>
<td>10:1</td>
<td>5</td>
<td>21,336</td>
<td>0</td>
</tr>
<tr>
<td>Cirrhosis/upper GI bleed</td>
<td>7</td>
<td>2.5:1</td>
<td>4</td>
<td>32,489</td>
<td>2</td>
</tr>
<tr>
<td>Liver failure</td>
<td>5</td>
<td>1.5:1</td>
<td>3</td>
<td>9,443</td>
<td>4</td>
</tr>
<tr>
<td>Alcoholic hepatitis</td>
<td>2</td>
<td>1:1</td>
<td>5</td>
<td>16,234</td>
<td>0</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>6</td>
<td>5:1</td>
<td>26</td>
<td>128,177</td>
<td>3</td>
</tr>
</tbody>
</table>

† LOS = length of stay.

from 200 consecutive admissions to the medical ICU were collected prospectively. The major reason for the patient's admission to the ICU was recorded. The causal relationship between the admission diagnosis and alcohol abuse was determined. The following disorders were classified as being alcohol-related: alcohol withdrawal syndrome and delirium tremens, alcoholic cirrhosis with liver failure or upper GI bleeding, alcoholic pancreatitis or hepatitis, or medical conditions resulting from alcoholic intoxication (e.g. aspiration pneumonia). Clinical and demographic data as well as the insurance status were recorded for all 200 patients. The cost of goods and services was determined by data provided by the hospital’s Billing and Accounts Department. For statistical analysis of data, the study sample was divided into two diagnostic groups; namely, an alcohol-related and a non-alcohol-related group. Summary statistics were compiled on each group. Continuous variables were compared using the unpaired Student’s t-test, and categorical data were compared by the χ²-test. All data are expressed as the mean ± SEM. Statistical significance was declared for P < 0.05.

RESULTS

Data on 200 consecutive medical ICU admissions were collected. Forty-two patients (21%) were considered to have been admitted with an alcohol-related medical problem. The clinical and demographic data of these patients are presented in Table 1. The alcohol-related admissions were more likely to be male, uninsured and younger than the non-alcohol-related admissions. Table 2 details the major diagnoses of the patients with alcohol-related admissions. The six patients in the miscellaneous group had the following major diagnoses: pancreatitis (1), alcohol intoxication resulting in aspiration pneumonia and acute respiratory distress syndrome (ARDS) (1), hypothermia, septicemia and ARDS (1), an alcoholic binge in a diabetic patient leading to ketoacidosis (1), alcohol-related acute rhabdomyolysis progressing to acute renal failure (1), and alcoholic coma...
The first three of these patients had a prolonged hospital stay with a disproportionately large hospital expense (Table 1). These three patients died.

**DISCUSSION**

We demonstrated that during the period under study 21% of all admissions to the Detroit Receiving Hospital Medical ICU were directly alcohol-related and consumed considerable hospital resources. Baldwin et al. (1993) reported that 9% of admissions to both the Medical and Surgical ICUs at Johns Hopkins Hospital were alcohol-related. The higher incidence of alcohol-related admissions to our ICU likely reflects the different social character of the referral area of our hospital, as well as the time of the year that the study was conducted. In contrast to the study by Baldwin et al. (1993), our study was conducted during the Christmas season when alcohol abuse is likely to be high. In addition, we reviewed only medical problems that were directly attributable to alcohol abuse, whereas Baldwin and colleagues reported on medical and surgical problems both directly and indirectly related to alcohol.

We found that alcohol-related admissions were significantly more common in male patients. Furthermore, the alcohol-related, were significantly younger than the non-alcohol-related, admissions. This observation has been previously documented (Taylor et al., 1986). It is noteworthy however, that almost all patients with the alcohol withdrawal syndrome were male. As might be anticipated, a significantly larger percentage of the alcohol-related admissions had no medical insurance when compared to the non-alcohol-related admissions (58 vs 39%; \( P < 0.05 \)). Baldwin et al. (1993) reported that 43% of the alcohol-related admissions in their study were uninsured, compared to 20% in the non-alcohol-related group.

The alcohol withdrawal syndrome was the commonest alcohol-related reason for admission to our ICU, accounting for 52% of all the alcohol-related admissions. These patients were admitted to the ICU for delirium tremens or recurrent alcohol withdrawal seizures. The total hospital charge for these patients was $234,698 (mean $21,336). Clearly this therapy was not curative, and one could speculate whether identification and treatment of the alcohol withdrawal syndrome in the early stages of the disorder might not be a more cost-effective treatment strategy. The management of patients with alcoholic cirrhosis and bleeding oesophageal varices and/or liver failure is complex and expensive, with recurrences common.

There is a frequently held misconception in the USA that the medically uninsured do not consume health care resources (Blendon et al., 1993; Stoddard et al., 1994). As is evident from this study, this tenet is not correct. Furthermore, the most economically and socially deprived sections of our society are at a great risk of suffering alcohol-related medical problems, often presenting to the emergency room late in the course of their illness with life-threatening medical conditions (Blendon et al., 1993; Stoddard et al., 1994).

Alcohol abuse is clearly an issue of major significance. The treatments of the medical consequences of alcohol abuse are expensive and unsatisfactory. In this era of health care reform, more effective primary and secondary preventative measures are required to combat this epidemic disease.

**REFERENCES**


