

Alcohol Withdrawal Syndrome

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KEYWORDS

- Alcohol withdrawal syndrome • Alcoholism • Intensive care
- Alcohol-related disease

KEY POINTS

- Alcohol abuse and the societal and economic costs of alcohol dependency are major problems in both the United States and throughout the world.
- In susceptible patients, alcohol withdrawal syndrome (AWS) is often precipitated by other medical or surgical disorders, and AWS can adversely affect the course of these underlying conditions.
- Although the mortality rate of AWS has decreased over the past few decades, significant risk for morbidity and death remain if conditions such as multiple trauma, severe sepsis, acute respiratory failure, and alcoholic liver disease complicate management.

Alcohol abuse and the societal and economic costs of alcohol dependency are major problems in both the United States and throughout the world.¹ More than 8 million Americans are dependent on alcohol; twice the number who abuse illicit drugs.² Alcohol abuse is associated with 85,000 deaths in the United States annually as well as additional morbidity and mortality related to accidents, suicides, family abuse, and other problems. The combined costs of alcohol abuse in the United States reach

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200 billion dollars each year.³⁻⁶ Up to 40% of all emergency department patients have alcohol in their system, 10% of whom have blood alcohol levels above legal limits.⁷ Once admitted, 8% of patients of general hospitals have been shown to exhibit signs and symptoms of the alcohol withdrawal syndrome (AWS), and the prevalence of these admissions to an intensive care unit (ICU) of inner-city public hospitals may exceed 20%.⁸⁻¹¹ Alcohol abuse directly or indirectly leads to acute and chronic conditions that affect all organ systems, and alcohol-use disorders are particularly common in critically ill patients.¹⁰⁻¹⁵ In the susceptible patient AWS is often precipitated by other medical or surgical disorders with adverse effects on the course of both comorbid conditions and AWS.

This review of AWS focuses on the scope of the clinical problem, historical features, pathophysiology, clinical presentation, and approaches to therapy, with particular emphasis on severe AWS that requires ICU management.

SCOPE OF THE PROBLEM

All clinicians are likely to encounter AWS, especially those involved in emergency medicine, inpatient care, and ICU care. It has been estimated that 500,000 episodes of AWS require pharmacologic therapy each year in the United States.² Many patients with mild signs and symptoms can be managed as outpatients or referred to detoxification centers¹⁶⁻²³; however, a significant number will present with more severe findings, often with comorbid psychiatric, medical, or surgical conditions, requiring evaluation and assessment in an emergency setting and hospital admission.^{8,9,14,21-23}

For those admitted, a significant proportion may require ICU management. In a review of 279 episodes of severe AWS in a public hospital over an interval of more than 2 years, approximately one-third required ICU management.²⁴ Marik and colleagues^{10,25} found that more than 20% of patients in an inner-city hospital required ICU admission, and Mostafa and colleagues²⁶ reported a similarly high percentage of admissions to an adult ICU for alcohol-associated problems. A high proportion of acute surgical, burn, and trauma patients will also exhibit signs and symptoms of AWS that have a significant impact on the management of their surgical problems.^{12,26-29}

Disorders related to alcohol use have an unfavorable effect on the severity and outcome of a variety of medical and surgical conditions, particularly infections.³⁰⁻⁴¹

MEDICAL AND SOCIAL HISTORICAL PERSPECTIVE

Alcohol abuse, including acute intoxication as well as AWS, no doubt has existed since the discovery of alcohol. Patrick McGovern of the University of Pennsylvania describes that in China 9000 years ago, stone-age inhabitants developed a mead from fermented honey and fruit with up to 10% alcohol content.⁴² Brewing and wine making were common throughout much of the Greco-Roman world.⁴³ The Romans had a god of wine (Bacchus) and were more than familiar with both the acute effects of alcohol intoxication and the consequences of chronic use (Fig. 1).⁴⁴ The Latin term *morbis convivialis* was coined during this period to describe the harmful effects of wine as a result of excess partying.⁴⁵ Hippocrates described "anxiety, yawning, rigor" as consequences of drinking; problems which could be healed by drinking wine mixed with an equal portion of water.⁴⁶

Adverse effects of alcohol were well known in the Middle Ages, as chronicled in 1314 by the famous physician John of Gaddesden (1280-1360) who was mentioned in *The Canterbury Tales*. "The adult must avoid immoderate drinking, because drunkenness is extremely harmful."⁴⁷ During the seventeenth century William Hogarth (1697-1764) vividly depicted the effects of excess alcohol in his paintings and

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