Sleep and Hazardous Drinking in the Elderly: A Clarion Call for Increased Clinical and Translational Research

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Understanding factors that contribute to the onset and maintenance of alcohol use disorders (AUD) has been a central goal of public health policy and federal funding mechanisms for several decades. To date, the majority of empirical studies describing trajectories of alcoholism focused primarily on the period between drinking onset and youth adulthood [1]. By contrast, there is a dearth of research focusing on drinking behaviors during late adulthood through midlife and aging. Consequently, risk factors that contribute to the onset and maintenance of AUD later in life are not well defined.

Although drinking rates decline with age, older adults may continue to engage in at-risk drinking behaviors [2-4]. In fact, it is now increasingly recognized that alcohol-related problems do not only concern the young population, but also occur in healthy older adults ranging between 10-15%, and around 35% in those seeking care for other health problems [5-7]. Further, a recent report from the Centers for Disease Control and Prevention, while providing additional evidence for the age-dependent decline in alcohol consumption, also finds that the frequency of binge drinking did not decline, and in fact was highest (5.5 episodes per month) in the 65+ age group [8]. The beneficial effects of moderate alcohol consumption not withstanding [9,10], given that physiological processes decrease the ability to metabolize ethanol [11], the immediate and long-term effects of hazardous drinking in older persons may be more severe than those observed in young adults.

This is of increasing significance as demographic evidence indicates that the elderly are the fastest growing segment of the population [12,13]. Thus, older adults are likely to live longer, carrying into later life the cumulative effects of physical and psychiatric problems. Hence, understanding the mechanisms that underlie the onset and/ or maintenance of hazardous drinking in older adults is essential for developing appropriate and adequate interventions to minimize harm and promote the health of this rapidly growing segment of the population.

A potential underlying cause for excessive drinking in older adults is sleep disruption. Sleep disturbance often accompanies AUDs, persisting into periods of prolonged abstinence [14,15]; and, in non-alcoholic primary care patients, ages 60 and older, using alcohol for sleep was associated with hazardous drinking behaviors [16]. Although some evidence exists from the child and adolescent risk literature that sleep difficulty predicts behavioral problems linked to addictions [17-19], little attention has been focused on the mechanistic role that sleep disruption may play in increased risk for AUD in general, and in the aged population in particular.

Aging is associated with profound changes in sleep patterns [20-22] and a weakening of the circadian system [23] which likely contributes to the sleep disruption and daytime fatigue observed in older adults [24]. Even though older adults seem to be less sensitive to the cognitive impairment that ensues from acute sleep deprivation or restriction, compared to younger individuals [25], they are not immune to the long-term or chronic effects of persistent sleep disruption. Chronic sleep difficulty is implicated in impaired emotional as well as cognitive functioning [24,26-29]. Thus, the emotional and cognitive mechanisms impacted by sleep difficulty may therefore be the foundation for the risk of hazardous drinking behaviors in older adults. Arguably, developing adequate detection and intervention tools would benefit from hypothesis-driven translational research. Such hypotheses can be derived from the already existing literature on the effects of sleep disruption on cognitive and emotional functions, and the role of impacted functions in risky behaviors.

The Dynamic Integration Theory proposed in 2003 by Gisela Labouvie-Vief [30] suggests that positive self- and emotional well-being requires the integration of the ability to optimize happiness with the ability to tolerate tension and negativity. Through life experience, older adults are adept at such integration under moderate emotional arousal, demonstrating greater resilience and competent emotion regulation under conditions of normative emotional challenges, compared to younger adults; thereby increasing their overall experience of well-being [31,32]. However, when confronted with more emotionally and cognitively demanding situations, that impose greater demands on cognitive resources which, in turn, impinge on conscious control of executive processes, older individuals demonstrate greater cognitive impairment relative to younger adults, including decreased executive control and inhibitory functioning [33,34].

Thus, under the emotional and cognitive challenge of impaired sleep, older adults may display more simplified, stereotypical thinking, with compromised emotion regulation in situations that require executive control [35], thereby impairing their ability to adequately monitor alcohol intake, whether it is used to improve their sleep, their mood, or reduce anxieties. Such a hypothesis is also consistent with models of addiction that postulate that substance use is a behavioral mechanism aimed at reducing, and subsequently avoiding negative affect [36]. Hence, to alleviate the negative affect associated with chronically disrupted sleep, older adults may use alcohol, perhaps unaware of the changes in alcohol metabolism associated with age.

In conclusion, as the ageing population in the US and developed countries continues to grow, the number of elderly people with alcohol use disorders will increase concurrently [2-4]. With minimal understanding of the mechanisms that underlie hazardous drinking behaviors, and a tendency to underestimate alcohol misuse in older people, or perceive it as reasonable in the context of poor health and changing life circumstances, alcohol use disorders in older adults may prove to be a significant health hazard. In some sense, this parallels the attitude towards sleep difficulty in this age group, which is also

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perceived as being secondary to the aging process and decreased health. It thus behoves us, both as researchers and as clinicians to focus a spot-light on the health concerns of this expanding number of older members of society, and to better understand the mechanisms that underlie risky alcohol and other substance-related behaviors, in order to minimize harm and improve the overall health and well-being of our senior citizens.

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