



PREVALENCE OF LONE ATRIAL FIBRILLATION IN ALCOHOLIC PATIENTS WITH ACUTE ISCHEMIC STROKE

Neurology

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ABSTRACT

Background: Lone atrial fibrillation (LAF) is a term for individuals without heart disease, with 2%-10% having idiopathic origin. Risk factors include height, obesity, sleep apnea, excessive alcohol consumption, caffeine, and inflammation. The current study aims to identify the prevalence of LAF in alcoholic patients with acute stroke. **Methods:** This prospective cohort study explored the relationship between alcohol consumption and atrial fibrillation (AF) in 30 male patients diagnosed with acute ischemic stroke over two years (January 2021 to January 2023) at the Stroke Unit of the Madras Institute of Neurology. All participants were known alcohol consumers and underwent 72-hour ambulatory Holter monitoring to assess cardiac rhythm and AF presence upon admission. Patient data was collected from the Neurology department based on the inclusion criteria. **Results:** The study reports 30 male alcoholics, with 5 alcoholic stroke patients having lone atrial fibrillation (LAF) with an age group of more than 60. A positive correlation was reported between alcohol consumption and AF incidence, with 66.66% of patients consuming alcohol for over ten years. All patients diagnosed with AF were heavy daily drinkers with over a decade of alcohol consumption. Stroke types varied, including posterior circulation and massive middle cerebral artery strokes. A 6.66% mortality rate was observed, primarily associated with massive middle cerebral artery strokes. **Conclusion:** This study underscores the significance of early AF detection in alcohol-related stroke cases and emphasises the need for tailored management strategies to mitigate associated risks.

KEYWORDS

Lone atrial fibrillation, Acute stroke, Heart disease, Alcohol, Cerebral artery, Acute ischemic stroke

INTRODUCTION

Historically, the terminology "lone atrial fibrillation" (LAF) predates our contemporary comprehension of the multitude of disorders that are likely contributory to the onset of AF and the resultant alterations in cardiac function that may be classified as heart disease. Although instances of AF devoid of concurrent heart disease had been observed previously, the term LAF was first introduced in 1954 by Evans and Swann [1] to characterise individuals for whom "subsequent investigation reveals an absence of heart disease." It was, and continues to be, regarded by many as synonymous with idiopathic AF. The expression LAF has been extensively employed and was generally acknowledged to encompass a minority of AF cases, although some reports suggested estimates of around 30%. [2]

While the etiological factors contributing to the escalating worldwide prevalence of atrial fibrillation (AF) [3-5] remain inadequately elucidated, contemporary research is contesting the conventional hypothesis positing that AF primarily arises as a consequence of ischemic heart disease secondary to arteriosclerosis or other cardiac pathologies, with the remainder of cases classified as "idiopathic" or LAF. Instead, an array of emerging correlations with AF, an expanding catalogue of cardiac disorders, enhanced imaging techniques and a more comprehensive comprehension of pathophysiological and genetic factors collectively suggest that AF is infrequently of idiopathic origin. [5]

Nonetheless, a noteworthy portion of AF patients, ranging from 2% to 10%, fall below 60 and do not exhibit any discernible cardiac or other etiological disorders [6]. These individuals are categorised as having LAF. In recent times, emerging risk factors for AF, encompassing factors such as height [7], obesity [8], obstructive sleep apnea, excessive alcohol consumption [9], caffeine intake and smoking [10], engagement in endurance sports [11], elevated pulse pressure [12], genetic predisposition [13], and inflammation [14], have come under scrutiny.

According to Mayo Clinic data, approximately 2% (76 out of 3623) of patients are diagnosed with atrial fibrillation. It is worth noting that similar observations regarding the relatively low occurrence of LAF in the overall population of atrial fibrillation patients have been reported

by others as well. Patients with lone atrial fibrillation were predominantly male, constituting 78% of this subgroup, and they were relatively young at the time of diagnosis, with an average age of 44.2 years. A small proportion of these patients exhibited permanent atrial fibrillation. Moreover, among those who initially presented with paroxysmal or persistent atrial fibrillation, the 30-year cumulative likelihood of progressing to permanent atrial fibrillation was remarkably low, at only 29%. [15]

Cohort studies have indicated that moderate alcohol consumption is linked to a reduced risk of congestive heart failure (CHF) [16] [17]. Nevertheless, while anecdotal evidence has hinted at episodic heavy drinking as a potential trigger for atrial fibrillation (AF), the precise relationship between the complete spectrum of alcohol consumption and the risk of developing new-onset AF remains somewhat uncertain. Nevertheless, research that directly compares clinical risk factors between patients with LAF and those with non-LAF forms of AF is presently limited. The current study aims to identify the prevalence of LAF in alcoholic patients with acute stroke.

MATERIALS AND METHODS

This research employed a prospective cohort design and spanned two years, from January 2021 to January 2023. The study was conducted at the Stroke Unit within the Madras Institute of Neurology on 30 patients diagnosed with acute ischemic stroke who were admitted to the Stroke Ward at the Madras Institute of Neurology.

Inclusion Criteria:

Patients aged between 18 and 80 years, patients with a confirmed diagnosis of ischemic stroke, and patients with a documented history of alcohol consumption were included.

Exclusion Criteria:

Patients with a known history of atrial fibrillation, non-alcoholic patients, patients with thyrotoxicosis, patients with a history of old coronary artery disease (CAD), and patients with valvular heart diseases were excluded.

Data Collection

After obtaining informed consent from each participant, ambulatory Holter monitoring was performed for 72 hours upon admission. This monitoring allowed for the recording of cardiac rhythm and assessment for the presence of atrial fibrillation.

RESULTS

In this study, a total of 30 patients were included for analysis. All participants were male, with no female representation in the study group. All 30 patients were identified as alcoholics, forming 100% of the study population. Among the alcoholic patients who had suffered a stroke, five individuals were found to have lone atrial fibrillation (LAF), representing 16% of this subgroup.

The age distribution among patients with atrial fibrillation (AF) showed that all cases were in patients aged more than 60 years. Regarding the age distribution of alcoholic patients in the study, six patients (20%) were in the age group of 20 to 40, 14 patients (46.6%) were in the age group of 40 to 60, and 10 patients (33.33%) were older than 60 years.

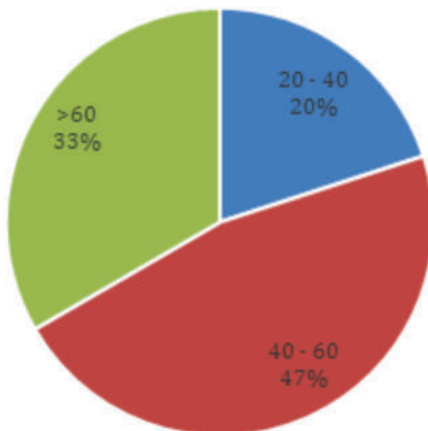


Figure 1

Regarding the duration of alcohol consumption, 20 patients (66.66%) had a history of consuming alcohol for more than ten years, while the remaining 10 patients (33.33%) had a history of alcohol consumption for less than ten years. All patients with lone AF had a history of alcohol consumption for over ten years.

Regarding comorbidities, three patients with AF had a history of diabetes, accounting for 60% of the AF patients. One patient had a history of both hypertension and diabetes, while one patient had no prior history of any comorbidities. Furthermore, one patient with new-onset AF had a history of ischemic cerebrovascular accident (CVA), representing 20% of the new-onset AF cases.

All patients in the study were daily drinkers. Their alcohol consumption patterns were categorised as follows: 10 patients (33.33%) reported consuming less than two drinks per day (considered light drinking), 14 patients (46.6%) consumed between 3 to 5 drinks per day (categorised as moderate drinking), and six patients (20%) reported consuming five or more drinks per day. Importantly, all patients diagnosed with AF were heavy daily drinkers with a history of alcohol consumption for more than ten years.

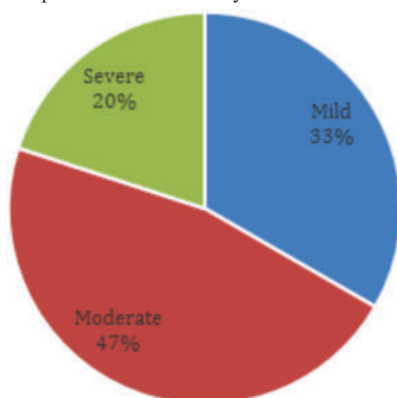


Figure 2

Two patients presented with posterior circulation strokes, which included one case of bilateral cerebellar infarct and another of right thalamic infarct. Additionally, three patients experienced massive left middle cerebral artery (MCA) strokes, and one had a right thalamic stroke. Tragically, our study observed a 6.66% mortality rate, with both fatalities attributed to massive MCA strokes. These findings underscore the significance of stroke type and location in the context of atrial fibrillation (AF) in alcoholic patients with acute ischemic stroke. Furthermore, they emphasise the potential severity of outcomes, particularly in cases of massive MCA strokes, underscoring the need for vigilance in identifying AF and implementing appropriate management strategies to mitigate the risks associated with these specific stroke presentations.

DISCUSSION

The current study reports the prevalence and complications of LAF patients in India. This is one of the first studies conducted in the Indian region to assess the clinical prevalence of LAF. Our study findings report a male predominance with no female patients observed with alcoholism and risk of stroke. In addition, five patients from our study had reported an incidence of stroke. Ellinor et al. also reported consistent study findings, where a male predominance was reported (male-to-female ratio; 4:6:1). [18] Similar study findings were reported by Lee et al., where male patients were more affected by LAF. [19]

Alcoholism and daily drinking were prevalent in our study, where all the patients were daily drinkers, and 46.6% had alcohol 3 to 5 times daily. It is noteworthy that AF in our cohort did not manifest in younger individuals, contrasting with the broader population, where AF can occur at a younger age due to various etiologies. Alcoholism has been reported as one of the major risk factors for the development of cardiovascular disease, including AF. The duration of alcohol consumption emerged as another noteworthy factor. Two-thirds of the patients had a history of alcohol consumption for over a decade, highlighting the potential role of long-term alcohol exposure as a contributor to AF in this population. Furthermore, all patients diagnosed with lone AF had consumed alcohol for more than ten years, suggesting a potential link between extended alcohol consumption and the development of AF independent of other comorbidities. The study conducted by Liang et al. among 2093 patients reported that individuals who engaged in binge drinking exhibited a higher risk of developing atrial fibrillation when compared to those who did not partake in binge drinking. After adjusting for relevant factors, the adjusted hazard ratio (HR) was 1.29, with a 95% confidence interval (CI) ranging from 1.02 to 1.62. This finding suggests that binge drinking is associated with an elevated risk of atrial fibrillation, emphasising the potential cardiovascular consequences of episodic heavy alcohol consumption. [20]

The association between alcohol consumption and AF appears to involve multiple intricate mechanisms. Experimental studies suggest alcohol intake can disrupt normal heart rhythm regulation, including inducing a hyperadrenergic state, diminishing vagal tone, and decreasing heart rate variability. [21] Increased alcohol intake shortens the effective refractory period of the right atrium, potentially promoting the initiation of AF through the propagation of premature atrial complexes and conduction blockages. In patients with stable coronary artery disease, moderate alcohol consumption initially reduces vagal heart rate modulation, transitioning to a sympathetic predominance and increased vasomotor activity. [22] These findings collectively underscore the multifactorial nature of the link between alcohol and AF, highlighting the complex interplay of autonomic nervous system factors and cardiac electrophysiology in this relationship, particularly in individuals with underlying cardiovascular conditions. Further research is needed to elucidate these mechanisms fully.

Comorbidities, specifically diabetes, were observed in a subset of AF patients. Diabetes was relatively frequent in our study (60% of AF cases), and its presence underscores the complex interplay of risk factors in AF development. The co-occurrence of diabetes and AF in one patient, along with a history of hypertension, emphasises the multifactorial nature of AF and the need for a comprehensive approach to its management in patients with acute ischemic stroke. The prevalence of diabetes was also reported by Lee et al., with a total prevalence of 13.7% out of 2,133 Korean patients with AF. [19]

Furthermore, a patient with new-onset AF had a prior ischemic

cerebrovascular accident (CVA) history. This finding underscores the interrelationship between AF and stroke, suggesting that patients with a history of stroke may be at heightened risk for subsequent AF development. The two-way relationship between AF and stroke warrants further investigation to understand this association's mechanisms and clinical implications. The incidence of CVA has been considered the most serious complication in stroke patients presenting with LAF. Alshehri [23] also reported a similar finding, where an incidence of embolic cerebrovascular accidents was reported in one patient, leading to significant mortality.

Alcohol consumption patterns revealed that all AF patients were heavy daily drinkers with a history of alcohol consumption for over ten years. This aligns with previous studies indicating that heavy alcohol consumption is a risk factor for AF. Importantly, no patients reported experiencing chest pain or palpitations preceding the stroke, highlighting the challenge of detecting AF in asymptomatic individuals, especially in acute ischemic stroke. [19][20]

Regarding stroke types, the study identified various patterns, including posterior circulation strokes and massive middle cerebral artery (MCA) strokes. The presence of both posterior circulation and MCA strokes in the AF group underscores the diversity of stroke presentations in patients with AF. Furthermore, the study reported a 6.66% mortality rate, with two patients succumbing to illness, both of whom had experienced massive MCA strokes. This emphasises the clinical significance of identifying AF in patients with acute ischemic stroke, as it can influence patient outcomes and treatment strategies.

CONCLUSION

Our study revealed that the prevalence of lone atrial fibrillation (LAF) detected through Holter monitoring in alcoholic patients in our population closely mirrors the global prevalence. Moreover, we observed a higher incidence of LAF in males with a direct correlation between longer durations of alcohol consumption and the development of atrial fibrillation (AF). Importantly, diabetes emerged as a major risk factor for acute ischemic stroke in alcoholics with AF. Furthermore, our study highlighted a heightened mortality rate in alcoholic stroke patients with AF. Patients were asymptomatic for AF, and diagnosis was only made during Holter monitoring post-admission. As a result, we recommend routine cardiac evaluations, especially after the age of 60, for individuals with risk factors such as alcoholism, a history of stroke, and diabetes. Additionally, our findings underscore the increased risk of stroke among heavy alcohol consumers with prolonged alcoholism.

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