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ATRIAL FIBRILLATION

Julianna G. Perritt , Jennifer Goldsberry

ABSTRACT

Atrial fibrillation, also known as A-Fib or AF, is a cardiovascular abnormality that is characterized by an abnormal heart rhythm or muscle contractions in the atria. These abnormalities are a result of disorganized electrical impulses. AF has various causes including, but not limited to, hypertension (HTN), heart surgery, thyroid disorders, heart defects, and acute alcohol ingestion. Persons with AF are often asymptomatic; however, some patients report heart palpitations, chest tightness, shortness of breath, and lightheadedness. A review of literature was conducted in order to determine the availability of risk factors, patient education, and treatment of AF.

REVIEW OF LITERATURE

A review of existing literature regarding AF causes and symptoms, risk factors, education, and treatment protocols was conducted using databases from EBSCO and secondary references from primary articles. Databases were searched using keywords such as atrial fibrillation, patient education, causes and symptoms, genetics, and treatment/intervention in varying combinations. The initial search returned 144,014 articles. Selection criteria were used to narrow the search to academic, peer reviewed, English publications published after 2015. This quickly reduced the number of articles retrieved to 20,980. These articles were further limited to articles/studies pertaining to the topic of atrial fibrillation, its causes and treatments. Most articles researched for AF were related to the treatment of AF with ablation therapy, but other resources were more difficult to find. There was also a lack of cohesion of the studies found. Thus, only 13 articles were used for this literature review on atrial fibrillation.

CAUSES AND SYMPTOMS OF ATRIAL FIBRILLATION

Atrial fibrillation (AF) is a cardiovascular abnormality that is characterized by an abnormal heart rhythm or muscle contractions in the atria. These abnormalities are a result of disorganized electrical impulses. According to Lozano-Velasco (2020) et al., "AF is known to be the most common supraventricular arrhythmia affecting up to 1% of the general population; its prevalence exponentially increases with age and could reach up to 8% in the elderly population" (p. 5717). In fact, aging and life-style choices that negatively affect cardiovascular health increase the likelihood of AF. According to Fishman (2019), AF commonly occurs as the result of an underlying heart condition; however, AF may occur with or without heart abnormalities. These heart abnormalities may be brought about by preexisting medical conditions or as a result of alcohol and drug abuse. One major predisposing factor of AF is hypertension or high blood pressure (Fishman, 2019). Frequently, patients are asymptomatic, but AF can present with a variety of symptoms. The chief complications from AF are life-threatening thrombo-embolic events such as pulmonary embolism or stroke.

Genetic Risk Factors. Causation of AF is often linked with genetics. In fact, it has been established by the Framingham Heart Study that a family history of AF increases the incidence of AF, even after accounting for other risk factors (Choi, et al., 2019). According to Fishman (2019), an interdependence exists between the heart's reaction to risk factors, aging, and genetics. A variety of literature explored the relationship between genetics and other risk factors for AF. In fact, various recent studies have found that AF and particularly, lone AF (without

underlying heart disease), has a substantial genetic basis ((Lozano-Velasco et al., 2020). Fishman (2019) and Lozano-Velasco et al. (2020) acknowledge that factors such as aging, gender, and comorbidities increase AF risk. Moreover, Zhang et al. (2020) and Choi, et al. (2019) agree that AF is caused by various pathophysiological factors and epidemiological evidence in recent studies have identified metabolic syndrome, structural heart disease, age-related fibrosis, pre-hypertension, obesity, obstructive sleep apnea, exercise and use of drugs and alcohol are related to AF. Nevertheless, multiple studies indicate a family history of AF compounds the risk of developing the disease. Additionally, Lozano-Velasco et al. (2020) reported that having one parent with AF doubled the risk of developing AF. Zhang et al. (2020) also suggest that there is a link between genetics and the probability of contracting AF. Furthermore, Choi, et al. (2019) found that genetic predisposition to AF plays a particularly important role in younger patients with early-onset AF and chromosome 4q25 variant alleles independently predicted AF recurrence after catheter ablation in patients with paroxysmal AF. Thus, the literature provides strong evidence that genetics and AF are strongly correlated. Considering that genetic underlying conditions such as hypertension and obesity increase the likelihood of contracting AF, it is not surprising that a family history of AF is a major risk factor as well.

Heart Abnormalities. AF can occur with or without underlying conditions; however, patients with heart abnormalities are at a much higher risk of developing AF. Heart abnormalities may be brought about by preexisting medical conditions or because of alcohol and drug abuse. Hypertrophic cardiomyopathy (HCM) is well-documented in AF patients; however, other inherited cardiomyopathies have been less frequently studied and documented in AF patients. Butters, et al. (2020), conducted a study on patients with other inherited cardiomyopathies such as familial dilated cardiomyopathy, arrhythmogenic right ventricular cardiomyopathy, left ventricular noncompaction, and inherited arrhythmia syndromes such as long QT syndrome, Brugada syndrome or catecholaminergic polymorphic ventricular tachycardia (CPVT) to determine their incidence, AF-related management and outcomes. The results of the study by Butters, et al. (2020) concluded that AF was observed in 5-31% of the patients studied and predicted that almost 33% of patients with inherited heart disease will develop AF. Similarly, studies suggest atrial

remodeling is one of the causes of AF. Malik, et al. (2020) found the cardiac autonomic nervous system (ANS) and any abnormalities located therein may be the source of atrial remodeling and contribute to the development of AF. The correlation between cardiac ANS and AF could also provide insight into treating the disease. The study by Malik, et al. (2020) also found that using cardiac ANS helps manage AF and may afford long-term decrease in the incidence of AF.

PATIENT EDUCATION

Patient's newly diagnosed with AF or AF-related complications, require knowledge in order to have confidence in making informed decisions about the treatment of AF and AF-related symptoms. A study conducted by McCabe et al. (2020), explored patient preferences for education regarding a new diagnosis of AF. The study found that patient's valued the knowledge that AF is not immediately life-threatening and that it does not impede their normal activities. This information made the patients feel less anxious and more open to discussion about the disease process of AF. This can give one cause to infer that patients are more receptive to education when their anxiety and fear levels are managed. There are a variety of ways to provide patient education including verbal explanations, visual aids, and demonstration. Many participants in the study conducted by McCabe et al. (2020), expressed a preference for written and video information as a supplement to verbal explanations of AF. Supplementation of verbal explanations with visual aids help patients to retain and remember information about AF. Moreover, a study by Pandya and Bajorek (2016) found that patients often used the web as a source of information and the study sought to find balanced and unbiased information about the available treatment options. The purpose was to enable and empower patients, so they would be able to effectively communicate concerns with their clinicians. The study reviewed 33 online sources and found that while there are a variety of highly accessible online resources, the quality was often lacking and the nature of information was inconsistent (Pandya & Bajorek, 2016). Thus, Pandya and Bajorek (2016) concluded that patients also need to be educated on how to evaluate the quality and accuracy of online sources. Overall, patient education should include general information regarding AF, a viable treatment plan, and specifics about medications within the treatment plan.

TREATMENT

Treatment of AF depends on the severity of symptoms, which are predominantly palpitations and shortness of breath. One treatment for AF is ablation, which is an invasive procedure. According to the study conducted by Bartoletti et al. (2019), an ablation is a procedure used to treat AF and can be a one time or repeat operation. AF ablation may not be a viable option for all AF patients. The ablation may be contraindicated in patients with elevated BMI (body mass index), COPD, diabetes, hypertension (HTN), smoking, sleep apnea, PVD, chronic renal disease, CHF, CAD, and pacemaker/defibrillator implant (Trines et al. 2019). These risk factors can lead to life threatening complications in patients receiving an ablation to correct their AF. The study conducted by Trines et al. (2019), concluded that patient's with more than one of these risk factors, have a 30% higher risk of arrhythmia recurrence post ablation. Another surgical treatment of AF includes the placement of a pacemaker. A pacemaker is a device that is placed in the heart through surgery. The pacemaker's job is to prevent the heart from having arrhythmias. According to the study conducted by Sandgren et al. (2018), most modern pacemakers have very specific algorithms that detect when a patient is experiencing AF. The information from the pacemaker and an ECG (electrocardiographically) is used to determine if the patient is experiencing an arrhythmia related to AF. The Maze procedure is also another surgical treatment for AF. The Maze procedure is when a patient is put under general anesthesia and their heart is shocked back into rhythm. According to Ad (2019), the Maze procedure results in higher single-procedure success rates but more complicated and life-threatening risks. Additionally, AF can be treated with oral medications. AF treatment includes several different classes of oral medications. The particular medication regimen is dependent upon the individual patient. The patient could be prescribed a beta blocker, digoxin or a nondihydropyridine calcium channel blocker as first-line medications for AF. When single drug therapy is inadequate in maintaining arrhythmias, digoxin is often given in combination with a nondihydropyridine calcium channel blocker or beta-blocker (Gauci et al, 2019). Amiodarone may be indicated if other medicinal agents are determined to be ineffective. It is vital to monitor AF patient's renal function and labs for signs of drug toxicity. The adverse side-effects of these particular treatments need to be judiciously considered before commencing treatment.

LIMITATIONS OF CURRENT EVIDENCE

Although there is an immense amount of literature regarding AF, there is a lack of literature related to education and varied treatment regarding AF. Multiple studies exist for the treatment of AF using ablation therapy; however, updated research on other treatments such as medications, pacemakers, and Maze procedure were difficult to find. The availability of studies related to patient education was also limited. There have been many studies conducted using various methods of information and teaching to better understand the incidence of AF. However, there seems to be a lack of cohesiveness and communication between researchers regarding their studies, which can lead to a plethora of information. Conversely, there is a lack of cohesive understanding of AF. In addition, this review was limited to scholarly resources in the English language; therefore, the findings of this review may not represent all available studies on understanding, treating, and educating patients about AF.

CONCLUSION

In conclusion, this literature review adds to the understanding of the occurrence and treatment of patients with AF. It has been identified that patients who have multiple risk factors are at higher risk for developing the disease and are more at risk for having more severe AF related complications. There is also a strong relationship between genetics and the occurrence of AF. Additionally, there are various treatment options available for patients with AF and each option should be carefully reviewed as part of the patient treatment plan. The review addresses that providing multiple sources for patient education allows the AF patients to better understand their diagnosis and is preferred by these individuals. Therefore, more education about risk factors and the treatment of AF is indicated.

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