Atrial Fibrillation

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Atrial Fibrillation

**Pathophysiology**

Atrial fibrillation (AF) is one of the most common sustained cardiac arrhythmia that progress with age. Structural remodeling is the pathologic change that is seen in Atrial Fibrillation, referring to the progressive fibrosis of atria. This fibrosis is caused by the dilation of atria, taking into account structural abnormality that raises the blood pressure in the heart. Dilated atria refer to the activation of the renin-aldosterone-angiotensin system. It results in an increase in deposition of matrix metalloproteinase and disintegration in walls of atrial. Unlike other cells, cardiac cells are more towards self-stimulation. As the heart's ability to conduction fails, there is ectopic activity in the cardiac cells, resulting in atrial fibrillation. It is important to note that in atrial fibrillation, many of the atrial cells self stimulate, i.e., they behave as individual pacemakers competing with the sinoatrial node that has the ability to control cardiac activity. Normal atrial contraction is replaced with quivering movements that are rapid along with contraction of heart.

 The lack of coordinated atrial contradictions may result in complications of atrial fibrillation, thrombi formation and heart failure. The formation of thrombi on the wall of atria and in left atrial appendage occurs when there is an ineffective emptying that allows blood to get pooled by these chambers. This emptiness is usually referred to as mural thrombus, these clots have the potential to dislodge and cause strokes along with other systematic thrombo-emboli. The lack of atrial contradiction may result in less blood that is entering and leaving left ventricle. (Pritchett, et, al. 2019).

**Disease Classification**

Atrial Fibrillation is categorized by the duration and frequency of the episodes that are further classified into five other categories such as persistent, long-standing persistent, paroxysmal, nonvalvular and permanent. It is significant to note that a patient can have both persistent and paroxysmal episodes. The categorization has an implication on the various treatment procedures such as catheter ablation and therapy decisions that refer to the medicines that are indicated for the patient.

 It is important to note that atrial fibrillation occur in different clinical circumstances. Primary arrhythmia refers to the absence of the identifiable structural cardiovascular disease. Secondary arrhythmia refers to the absence of any structural heart disease however there is a presence of systematic abnormality that predisposes an individual to arrhythmia. It is significant to note that secondary arrhythmia is associated with the cardiac disease that can affect atria. (Pritchett, et, al. 2019).

There are three major types of atrial fibrillation, chronic, acute and lone/ primary.

**Acute**

It has an onset referring to 24-48 hours of the causative events, and it converts spontaneously or in response to an antiarrhythmic agent. It occurs in individuals who are although normal clinically but they have a temporary change in their conitiodoins.

**Chronic**

It is paroxysmal and one of the most debilitating forms of Atrial Fibltaion because it has an abrupt onset. Chronic Atrial Fibrillation may be permanent or persistent, taking into account the required intervention by cardio version to sinus rhythms.

**Lone**

Lone or primary Atrial Fibrillation occurs in the absence of any other clinical evidence that can suggest a primary cardiac disorder.

**Signs and symptoms**

Atrial Fibrillation is one of the most common types of irregular heartbeat. There are several people whose symptom of Atrial Fibrillation goes undetectable until a physical examination is made. While, many of the patients experience symptoms such as pain and irregular heartbeat, thumping of chest, general fatigue, shortness of breath and anxiety along with sweating. One of the most common symptoms is dizziness, weakness, and pressure on the chest. (Smeltzer, et, al. 2008).

**Risk Factors**

There are several risk factors of Atrial Fibrillation, such as

**Age**

Age is one of the risk factors; old people are more prone to Atrial Fibrillation. People above 60 years of age are more likely to get heart disease, ultimately paving the way for the causing condition of AF. (Smeltzer, et, al. 2008).

**Pulmonary Embolism**

Pulmonary embolism refers to a blood clot in the lungs, and it is one of the risk factors of Atrial Fibrillation.

**Hypertension**

Exposure to long term blood pressure can pave the way for strain in the heart, and it can increase the risk of Atrial Fibrillation. (Pritchett, et, al. 2019).

**Heart Disease**

Patients having a history of heart valve disease, coronary artery disease, heart failure, and any previous heart attack can increase the risk of Atrial Fibrillation

**Family members with AFib**

Genetic factors also play a major role in causing Atrial Fibrillation.

**Excessive consumption of alcohol**

Men who are taking more than two drinks each day and women who are taking more than a single drink each day are at a risk of becoming a victim of Atrial Fibrillation

**Sleep Apnea**

Sever condition of sleep apnea can cause Artal Fibrillation.

**Chronic Conditions**

Long term chronic conditions such as asthma, obesity, thyroid problems, and diabetes can act as primary risk factors for atrial fibrillation

**Surgery**

Surgery can become a risk factor for the subject disease because a patient after receiving heart surgery can become threatening to atrial fibrillation. (Boriani, et, al. 2018).

**Medical Interventions**

Atrial Fibrillation can be controlled by managing anticoagulation and heart rate along with rhythm control. It is significant to note that medical interventions are highly dependent on the degree of symptoms, along with successful cardioversion and presence of comorbidities. It also includes AF ablation, i.e. catheter-based pulmonary vein electric isolation and surgical ablation. Restoration of sinum rhythm along with regularized heart rhythm is one of the tools to improve cardiac hemodynamics and exercise. (Lin, et, al. 2019). The maintenance of atrial contraction in order to manage the symptoms of heart failure and remodeling of ventricular taking into account restoration of sinus rhythm or in some cases left ventricular dysfunction and reversed atrial silaton with new onset of AF is also an effective medical intervention. The intervention of embolism with anticoagulation therapy is also one of the potent medical interventions. It is significant to note that the priorities of the treatment are highly dependent on the patient ability to tolerate the heart rhythm. The control of heart rate is usually made with chemical cardioversion, while atrial contraction is delayed by having a follow up with the return of atrial activity. (Smeltzer, et, al. 2008).

**Nursing Interventions**

As the main goal of intervention is to maintain and stabilize cardiac output and perfusion of tissues, it is important to ensure that the patient does not develop thromboembolism. The medical team should be vigilant enough to be notified whenever the heart rate of the patient is rapid and when the systolic blood pressure is less than 90mmHg. Nurses incorporate emergency cardioversion that is required for hemodynamic compromise. It refers to the explanation of the procedure to the patient and to reassure the patient. Careful positioning of the patient is taken into account in order to avoid an excessive exacerbating to the current condition. It is the duty of the nurse to keep patient in a semi-recumbent position, avoiding lying flat because it can increase pre-blood load or the rate of returning blood to the heart, because it refers to an increased danger to heart failure. If the patient feels breathless, nurses impart oxygen. (Boriani, et, al. 2018).

**Nursing Diagnosis**

The nursing pattern for a patient suffering from Atrial Fibrillation refers to the diagnosis of three main concerns, anxiety, and decreased cardiac output and decreased activity tolerance. (Pritchett, et, al. 2019).

**Anxiety and Fear**

It refers to the condition when the patent is experiencing a paroxysmal onset; taking into account a fear that threatens dysrhythmia and a refusal to participate in self-care, coordination with the doctor and taking the consent form the doctor. In such a stance, the responsibility of the nurse is to assess the patient in coping strategies and the ability to cater to the situation. It also includes an assistance of the patient in the identification of problem and teaching patient about the medical diagnosis such as pathophysiology, treatment, cardiovascular management, and other treatments, Nurses usually suggest inner relaxation techniques to cater to the patient’s concerns. (Boriani, et, al. 2018).

**Decreased activity tolerance**

Another subject associated with nursing intervention is, the assessment of cardiac status that is prior to activity and the involvement of viral that are prior to the activity, taking into account the provision of baseline status of heath and cardiovascular stance. Nurses observe and document the tolerance activity of the patients; it is also accompanied by the assessment of exacerbation of dysthymia during the activity. (Pritchett, et, al. 2019).

**Decreased Cardiac Output**

It is related to the loss of atrial kick, taking into account fibrillation. Some of the major symptoms include a decrease in blood pressure, chest pain, and dyspnea. In such a case, there is a continuous monitoring of EKG, an assessment and documentation of vital physical symptoms. A nurse maintains at least one patient IV and supplemental O2. (Boriani, et, al. 2018).

**Nursing Implication**

Nursing implication refers to the improvement of the patient’s outcomes, taking into account the patient education and care coordination that are effective for disease management. (Smeltzer, et, al. 2008).

**Nursing Prevention**

It is necessary for nurses to stratify the risk associated with the patient in order to determine the risks, and benefits that are well suited for the patients. It refers to the use of certain tools that can participate in risk stratification. One of the potent tasks is to adopt for stroke prevention for the patient who is suffering from nonvalvular atrial fibrillation, assessment of the anti-thrombi agent’s measurement of the contradictions that are mandatory to chronic antithrombotic therapy. Nursing prevention also includes an assessment of the safety concerns that are associated with drug and antithrombotic gannets. Patient education is one of the undeniable section of the nursing preventions that should be adopted in order to address the needs of the patients. It also includes the management of bleeding. It is significant to note that a nurse is committed to address the discontinuation of the therapy for surgery and other procedures in accordance with the body’s requirements, taking into account the elective surgery and invasive procedures. Nurses take into account the schedules regarding low risk of bleeding and the medication should be stopped prior to surgery. (Boriani, et, al. 2018).

**Nursing Interventions**

There are certain interventions that are adopted by nurses. It would not be wrong to say that there is a systematic inflow of interventions. (Pritchett, et, al. 2019).

**ECG**

One of prime intervention is to obtain a 12 lead ECG that is then used to identify and diagnose atrial fibrillation. It is important to note that the waves are more random and chaotic and the beats are irregular.

**Potential Rhythm Control**

 Nurse infers potential rhythm control, adhering to ablation, electrocardoversona, and pacemaker. Electrocardioversion is used to register the heart’s electricity and pacemaker is placed under the skin that is capable to sending electrical signals to the heart to make it possible for heart to beat it with the right rhythm and pacemaker. (Lin, et, al. 2019).

**Heart Rate Control**

Nurses use beta-blockers and calcium channel blockers in order to sustain rapid breathing for so long before it tries out. The purpose of blockers is to maintain the rate of heartbeat. The aim of these blockers is to block the Na + and K+ channel in cardiac myocytes. When the channel opens, K+ moves into the cell, and Na+ moves out of the cell also called reploralization. This procedure refers to the relaxation of heart beat. However, when it is blocked there is an increased contraction of heart.

**Anticoagulants Therapy**

 Thinning of the blood supports the disintegration and breakup of the clot that facilitates the increase in blood flow. There are many other options for blood thinners, and each of it has its own pros and cons.

**Education**

It is the duty of the nurse to educate the patient about blood thinner, taking into account the risk of bleeding out if there is a hit or fall in the head. Environmental hazards are also taken into special consideration such as eliminating throw rugs and adequate lightning system. In case, a patient experience a fall and hit, there should be a quick intervention of ER.

**Stroke Education**

As there is a risk of blood clotting in the head and brain of the patient, a nurse teach the patient and his family members about significant signs and symptoms of stroke.

**Cardiac Enzyme Monitoring**

A nurse keeps a check on the initial measurement of enzymes, as it helps in the trending information, taking into account trending results over time. (Boriani, et, al. 2018)

**Nursing Outcomes**

Nursing outcome refers to the desired results and outcomes taking into account the successful interventions. There are certain outcomes that are assumed such as decreasing the risk of clot formation, bringing heartbeat within the normal limits and controlling the rhythm of heart. One of the ultimate outcomes of the nursing intervention is to bring normal sinus rhythm because there are many people who are living with atrial fibrillation, considering the fact that rhythm control doesn't work or it is not necessary. (Smeltzer, et, al. 2008).

**Age Considerations**

Atrial Fibrillation vary with age factors, taking into account medical an nursing interventions

**Gerontologic patients**

Atrial fibrillation is one of the most common diseases in elderly patients. Usually, elderly patients suffering from the subject disease are treated with a comprehensive assessment that includes functional, social and comorbidities status. Anticoagulation therapy is usually used, using both conventoanland newer medications. Percutaneous left atrial appendage closure is one of the invasive procedures that is evolved and is used as an alternative to the systematic anticoagulation therapy. Invasive methods include catheter ablation that is used as a new frontier of treatment to maintain even sinus rhythm. (Lin, et, al. 2019).

**Pediatric patients**

Atrial fibrillation is much rare in children, however, the procedure of assessment, and diagnosis is much similar to adults. Usually, EKG or ECG is used as a test to record and create the electrical pattern of the heart. Electrophysiology and stress test is used to adhere to the normal functioning of the heart. Heart monitors are applied to trace the activity of heart. Medication is used by the doctor to treat atrial fibrillation, taking into account that the child faces the risk of atrial and pulmonary embolism much like adults. (Smeltzer, et, al. 2008).

**Diagnotic Labs**

There are two “lab diagnosis” involved in Atrial Fibrillation, Electrocardiogram and Holter Monitor (Lin, et, al. 2019).

**Electrocardiogram**

It is a painless test involved in the diagnosis of AFib. It records the heart’s electrical activity, taking into account the speed of heartbeat. It traces the rhythm of heartbeat, strength and timing of electrical signals that are passing through the heart. A doctor or technician place small patches on the areas of the body including the chest, these patches signal the wave pattern, portraying the picture of the heart.

**Holter Monitor**

This device is used to record the electrical activity of heart. The timing ranges from 24 to 48 hours giving a better chance of picking up the normal heartbeat also known as arrhythmia. (Boriani, et, al. 2018).

**Medications**

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| **Medications**  | **Classification** | **Dosage** | **Route** | **Indication** | **Contraindication** | **Side Effects** |
| **acebutolol** | Beta-blocker | **(adult)**200 mg twice per day, an increased dosage requires 600 mg taken twice per day **(Child)**Not recommended for children  | Oral capsule | Acebutolol is used to treat hypertension and high blood pressure as well as an irregular heartbeat. | (null) | Ceratin common side effects are slower heartbeat, diarrhea, tiredness, constipation, upset stomach and muscles aches or pains. Serious side effects are tiredness, fainting poor circulation, erectile dysfunction, depression, and liver damage.  |
| **pindolol** | Beta-blocker | Pindolol is usually recommended as a 5 mg dose alone or in combination with other antihypertensive agents. Inconsistent disease there is an increase up to 10 mg/day taking into account that it may increase up to 60 mg/day | Intravenous route | Management of edema, atrial fibrillation, hypertension, and ventricular tachycardias.  | Pindolol in counterindication in patients with hypersensitivity to a drug or any of its excipients, asthma, second and third-degree heart attack and severe bradycardia. | Drowsiness, nausea, dizziness weakness and reduction of blood flow to hands and feet. There is a risk of heart failure, nervousness, muscle pain, abdominal discomfort, bradycardia, and lethargy. |

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