Management of Atrial Fibrillation

Objectives

At the end of the presentation, the audience will be able to:

• Understand the phases of atrial fibrillation, causes and triggers
• Understand risks for stroke and anticoagulation therapy
• Understand treatment options / Living with atrial fibrillation

I. Introduction

Atrial fibrillation (AF) is a widely known arrhythmia in the United States (US). It affects one percent of the population, mostly people older than 50 years old, which is more than 2 million people. Its prevalence doubles at age 70. It affects men more than women and is associated with increased risk in cardiovascular morbidity and mortality, (Aksnes & Kjeldsen 2010). The Economic Burden of AF is projected to increase to 15.9 million dollars by the year 2050. AF is an independent predictor for stroke and heart failure. The most serious and debilitating complication of AF are thromboembolic strokes.

The risk for stroke increases by as much as 23% among those reaching 80 years or beyond. This population of patients who had a stroke had twice the risk mortality and 3 times the risk of recurrent stroke within a year in comparison with patients without AF, (Reynolds & Essebag, 2012).

II. Definition

a. Atrial fibrillation (AF) is an irregular, disorganized, and chaotic electrical activity in the upper chambers (atria) of the heart, which quiver rapidly and uncontrollably leading to tachycardia, which can cause a range of symptoms. AF is not life-threatening, however, there is an increased risk for strokes and can lead to heart failure, (Curtis, 2013 & Aksnes, & Kjeldsen, 2010)

b. Phases of atrial fibrillation

Paroxysmal AF occurs intermittently up to seven days with spontaneous conversion. Persistent AF can occur intermittently or continuous for more than seven days requiring cardioversion by mechanical or chemical means (Aksnes & Kjeldsen, 2010).

Permanent AF is continuous for more than one year no matter the treatment including medications, cardioversions, or even ablations. Therapy then switches to rate control in order to minimize symptoms and rapid ventricular response (Curtis, 2013)

III. Diagnosing AF
Usually its definite diagnosis is by a 12 lead or 15 lead electrocardiogram. This happens to be the most reliable method to confirm AF.

Other available methods for screening are:

a. 24 hour Holter monitor (Recordings for 24 hours)
b. Two week monitoring / event monitor (recordings for two weeks some live programs), (Naccarelli, Varker, & Lin, 2009).
c. Four week or 30 day home monitoring (sane as two-week monitor), (Naccarelli, Varker, & Lin, 2009).
d. EP study (done under local anesthesia screening electrical conduction of the heart muscle), (Naccarelli, Varker, & Lin, 2009)
e. Implantable loop Recorder (simple device measuring one quarter thick and one inch long. It is usually inserted under local anesthesia takes 45 minutes prep and are usually discharged to home the same day). They have to be followed up by Device clinic every 3 months for up to three years or until the purpose is found. (Naccarelli, Varker, & Lin, 2009)

IV. Symptoms
Not everyone in atrial fibrillation (AF) will experience symptoms. Some people are unaware that they are in AF even in rapid ventricular response or tachycardia. Others know immediately when their heart is irregular even when heart rate is below 100 beats per minute. Symptoms range from fatigue, difficulty breathing, weakness, confusion, palpitations, chest pressure, chest pain, and or decrease exercise tolerance. Symptoms may be related to rapid heart rate (>100 bpm) when in AF. Symptoms may disappear when medications control heart rate. In some people even rate control can be symptomatic. Newly diagnoses people with AF without symptoms must go for medical treatment due to the risk of strokes and heart failure, (Naccarelli, Varker, & Lin, 2009).

V. Causes
a. Cardiac causes of AF:
   • Coronary Artery Disease leading to myocardial infarction about 10% of this population will develop AF, (Curtis, 2013).
   • Valvular heart disease-the usual cause is primarily aortic valve stenosis and mitral valve stenosis. Valvular repair-scaring leads to AF and tachy-palpitations, (Curtis, 2013).
   • Congestive heart failure (CHF) may lead to AF and AF may lead to CHF. In CHF, the myocardial changes enlargement and thickening of the heart muscle primarily in the atriums, this will lead to quivering. AF when in rapid ventricular response of heart rates greater than 150 bpm sustained for more than 72 hours will lead to tachycardia-induced heart failure, (Naccarelli, Varker, & Lin, 2009).
• Hypertension treated or untreated, leads to cardiac structure abnormalities, which leads to enlarged atriums, which leads to fibrillation, (Aksnes, & Kjeldsen, 2010)

b. Metabolic disease that can cause AF are:
• Thyroid disease (an overactive thyroid) leads to hyperthyroidism leads to over stimulation of the sympathetic nerve triggering atrial stimulation which sends thousands of impulses to the ventricles which leads to tachycardia also known as rapid ventricular response which leads cardiomyopathy. Some individuals may develop AF for no reason, and in the absence of any heart disease, this is commonly known as lone atrial fibrillation, (Curtis, 2013).

VI. Other common factors leading to AF
Males are at a greater risk than females. Ethnicity commonly the white male has a greater chance of developing AF. Hereditary seems to be very common and age over 60 years old. Ten percent of the population will develop AF. It doubles by their 70 th birthday and triples by the time they turn 80 years old. Half of the population will be over 60 years old by the year 2050 (Aksnes & Kjeldsen, 2010).

Other common factors that contribute to developing AF have been BMI> 30, Smoking, alcoholic beverages as little as one drink a day, whether it’s one beer, one glass of wine or scotch and water. Some people who have been drinking for more than 10-20 years have a higher risk for developing AF. People who bench drink have less of a chance to develop AF (Curtis, 2013).

Other factors that contribute to AF are sleep disorders primarily moderate to severe sleep apnea, pulmonary disease such as asthma, chronic obstructive pulmonary disease (COPD) (Boriani, Botto, & Padeletti, et al 2011).

Gastric esophageal reflux disease-moderate to severe will trigger palpitations, some arrhythmias including atrial fibrillation, premature ventricular contractions and premature atrial contractions ((Boriani, Botto, & Padeletti, et al 2011).

Some over the counter medication that have been associated with triggering AF have been Nasal (Afrin), and oral decongestants, Coffee (>2 cups per day), energy drinks (it only takes one!), weight loss supplements with ephedra, or caffeine more than 90 mg per serving (Curtis, 2013).

CASE STUDY
• 66 y/o wm, comes to your clinic for the first time. He is coming with complaints of fatigue. He reports to be reports used to be able to play 18 holes of golf under four hours. Now it takes him forever to play 9 holes. He comes home exhausted.
• His vitals are: b/p 146 / 88, pulse is 134 bpm, RR 22 rpm, Temp 98.7, he is 65 inches tall and weights at 205 pounds.(BMI=34.1 kg/m2)
• PMHx: HTN, obesity, allergic rhinitis, DM II (controlled on diet)
• SHX: cholecystectomy, and hernia repair
• FMHX: mom died at 85 complications related to CHF, DAD was 88 of a heart attack; two brothers who are diabetic one sister smoker

Medications
Amlodipine 10 mg po daily
Hydrochlorothiazide 25 mg po daily
Nexium 20 mg po daily
Claritin 10 mg po daily
Supplements: MVI over 50 daily
Allergies: NKA

His physical exam: Lungs CTA, heart irregular to auscultation, soft 2/6 murmur left lower sternal border
EKG Strip: Atrial fibrillation with ventricular heart rate 88 bpm

VII. Stroke risks
Atrial fibrillation increases the risk for developing thrombus in the Left atrium (abnormal pattern of blood flow thru atria), as these clots form and the atriums convert to sinus rhythm can send thrombi to brain which leads to cerebral accidents also known as strokes. Young healthy individuals with lone AF have a low risk for strokes. Stroke risk increases in the elderly and in those individual with the following conditions:

Congestive heart failure, hypertension, age> 65 years old and doubles after >75, diabetes mellitus, and previous history of strokes or transient ischemic attacks (TIA), coronary artery disease, peripheral arterial disease including carotid stenosis (Boriani, Botto, & Padeletti, et al 2011).

VIII. Anticoagulation therapy
Not everyone requires anticoagulation therapy. We know that patients with AF have a higher chance of having strokes than a person without AF. Some patients only require an aspirin if their risk factors are zero or less than one based on CHADS2+Vasc score tool. Those with a score of two or higher will require some kind of anticoagulation therapy. The following are available in the market.

• Aspirin 81 mg po daily or 325 mg po daily usually recommended to be taken with food
• Warfarin / Coumadin monitored by Coumadin clinic which, requires an INR level of 2-3
• Pradaxa (Dabigatran) dose at 150 mg po BID or 75 mg po BID depending on creatine clearance (CrCL) of < 50. This needs to be given with food to prevent GI SE
• Xarelto (Rivaroxaban) dose at 20 mg po daily to be given with food. 15 and 10 mg are given for decrease CrCl <50
• Eliquis (Apixaban) dose at 5 mg po BID with food and or 2.5 mg po BID for CrCl < 50.
• Edoxaban (Savaysa) used to treat DVT and PE. (not available in the military system)
• They should not be on more than one. Aspirin 81 mg po or Plavix maybe given if a recent cardiac or vascular stent has been implanted.
• Bleeding precautions are necessary.
• CASE Study continue What to do?
• Vital signs stable? Yes
• Is he symptomatic-yes somewhat
• First time. who knows how long he has been in AF…… needs immediate anticoagulation therapy
• Rate control
• Rhythm control
• Modify medications
Labs?
Cbc, cmp, BNP, coagulation, magnesium, TSH with T3, CXR (if not one in last six months)
24 hour holter monitor vs 2 week event monitor or hospitalization
CAD assessment / stress test or CAC vs CT coronary angiogram

IX. Treatment options
Normal sinus rhythm is often attempted with symptomatic and or asymptomatic AF. Yet any patient diagnosed with atrial fibrillation is recommended to be on the following basic drugs beta blockers (such as metoprolol, carvedilol, bystolic, atenolol, propranolol etc,) which strengthen parasympathetic nerve and helps prevent AF from reoccurring. Ace inhibitors such as Zestril, Ramipril have been associated with decreasing recurrence of AF by the angiotensin effect on the atriums for remodeling. Low doses if blood pressures are low. ARBs such as Losartan are very effective for blood pressure control and most definitely for cardiac remodeling. Caution for potassium elevation or renal disease. Calcium channel blockers such as verapamil, cardizem, Diltiazem help control rate and recurrence of AF.

If patients still have recurrence of AF then they advance to anti-arrhythmia therapy, which works 70% of the time, and carry many side effects of fatigue, bradycardia, lack of energy, chest pain with exercise or chest pressure with walking. These medications can stabilize the atrial fibrillation or convert to sinus rhythm.
Persistent AF may require cardioversion with use of antiarrhythmic drugs (AAD).

• Flecainide dose starts at 50 mg BID to 150 mg TID ( it must be given with a BB or CCB if blood pressure can handle it) They need an ekg within 72 hours of starting medication to evaluate for prolong QTc interval and or other arrhythmias.
• Sotalol starts at 80 mg and is given BID, it can be titrated to 160 mg po BID. Patients must be hospitalized to load based on CrCl and prolong QTc interval. They must be monitored for 72 hours at the very least. Magnesium and potassium levels are monitored while on Sotalol which has been known to use it up in the process.
• Dofetilide starts at 250 mcg BID up to 500-mcg po BID and must be hospitalized same process as Sotalol.
• Propafenone 150 mg TID or Rhythmol and Multaq are basic antiarrhythmic drugs which are considered the lowest level available to be given as outpatients. Patients must get an ekg within their fifth dose to measure prolong QTc. Multaq 400 mg must be given with high protein diet twice a day, an ekg must be done within 48 hours or by the fifth dose.  
• The strongest of the AAD is Amiodarone 200 mg. It may be titrated aggressively or slowly over 2 weeks. Must check lab work for liver enzymes, CrCl, and thyroid panel. IF patients are going to be on it for a prolonged period of time > one year, it is recommended to complete surveillance work up such as ophthalmology, urology, GI, Pulmonary and lab work, (Jaïs, Cauchemez, Macle, et al, 2008).

As patients continue to experience AF despite rate control medications and rhythm control medications than there is another option available. This option may be atrial fibrillation ablation, which consists of medication preparation such as anticoagulation therapy, antiarrhythmic medications, and two days in the hospital and general anesthesia with one-year recovery. Radiofrequency (RF) catheters are inserted thru venous access leads into the atria. RF ablation is performed including a transeptal penetration leading to the isolation of the pulmonary veins for isolation to minimize electrical abnormality leading to sinus rhythm. Recovery is usually one week and ready to go back to work. (Jaïs, Cauchemez, Macle, et al, 2008).

Not everyone can tolerate an atrial fibrillation ablation. Some people may not be candidates for an atrial fibrillation ablation, especially if weight is over 300 pounds. Device options consists of pacemaker implantations usually single atrial lead or double lead pacemakers. These dual chamber pacemakers are the most common implantable devices available from different venders. The pacemakers do nothing for AF but will keep a consistent heartbeat and prevent arrhythmia induced syncope, and can provide more energy. Other devices available are Automatic implantable cardiac defibrillators (AICD) and chronic resynchronization devices. Sometimes implantable loop recorders are used for diagnostic purposes for hidden AF or possible cardiac related syncope (Curtis, 2013).

X. Treating patients with AF is a holistic approach. The treatment for AF must be individualized. Some people require a series of different treatments before the best management approach is found. Considering a balance of electrolytes and minerals making sure that their calcium, potassium and especially magnesium are at level. Magnesium level should be between 2.3-3.0. This has been effective in patients which AF. It alone may convert patients to sinus rhythm and or organize AF.

Lifestyle considerations can be helpful in managing AF and symptoms.
• Consider a heart healthy diet (mostly vegetables and fruits high in magnesium, potassium and calcium) limit starches to one per day.
• Exercises as much as possible such as walking, or bike, or jogging 30 minutes per day five times per week without stopping.
• Sleep hygiene- straight sleep for minimum 6 hours, may use CPAP machines or sleeping aids. These can be chamomile tea, Linden or Valerian, or sleepy time teas to be drank at 30 minutes prior to sleep. Consider melatonin as an alternative but must be taken for a week and lights must be off when attempting melatonin
• No smoking or tobacco or snuff or dip at all it will trigger the intima to respond rapidly
• Limit alcoholic beverages, (one drink twice a week) prefer stop.
• No energy drinks, no sodas including diet drinks.
• Limit coffee to no more than 16 oz per day
• Avoid over the counter medications such as nasal decongestants like Afrin or Claritin D, Zyrtec D, (Osbak, Mourier, & Kjaer, et al, 2011), (Curtis, 2013) & (Abed, Wittert, Leong, et al, 2013).

XI. Any questions please contact us at 210-916-4717 or 210-916-2324 or e-mail me at josevillafnp@yahoo.com

References


