

DEFINITION

1. **Arrhythmia**

- 1.1. The term cardiac arrhythmia (or dysrhythmia) describes an abnormality of cardiac rhythm of any type. Arrhythmias are usually associated with structural heart disease or non-cardiac provocative causes, but may occur in the absence of any of these factors.
- 1.2. **Atrial fibrillation** is a common arrhythmia characterised by rapid, disorganised activation of the muscular walls of the atrial chambers of the heart without effective contraction. There are 350 to 600 atrial discharges per minute. The electrocardiogram shows the absence of "P" waves which are indicative of normal atrial contraction and (except in some long established cases) the presence of small "f" waves which are irregular in rate and size.
- 1.3. As a result of atrial fibrillation, contraction of the ventricles becomes irregular in both force and rate, usually at a rate of between 100 and 160 beats per minute, impairing the efficiency of the heart which is further compromised by impaired ventricular filling. The pulse is characteristically "irregularly irregular".

CLINICAL MANIFESTATIONS

- 2. The nomenclature of the clinical syndromes in atrial fibrillation is somewhat arbitrary, imprecise and not universal, but the following broad classification is widely accepted:
 - **Acute** Episodes lasting for less than a few days.
 - **Paroxysmal** Recurrent episodes that resolve spontaneously or need intervention to do so. About 12% of these patients develop the chronic form within 2 years.
 - **Chronic** Atrial fibrillation of long duration which may or may not be amenable to treatment.
- 3. Atrial fibrillation may be asymptomatic, especially in the elderly in whom it is more prevalent. More characteristically, the onset is marked by paroxysmal attacks lasting anything from a few seconds to a few days. The commonest presenting symptom is dyspnoea. In a study of patients admitted to hospital with atrial fibrillation, 50% had dyspnoea, 34% had chest pain, 26% had palpitations and 19% had dizziness or syncope. The presentation may be dramatic with cardiac failure occurring rapidly.
- 4. In chronic cases, the first manifestation may be that of embolism in another part of the body, most importantly the brain, resulting from thrombus formation in the left atrium. Consequently, patients with chronic atrial fibrillation are at risk of stroke.

5. If the fibrillation is of recent onset, antiarrhythmic drug treatment or electrical stimulation under anaesthetic (cardioversion or electroversion) may restore normal rhythm. When the cause is outside the heart, it may respond to removal of the provocative factor. If these measures fail, and in cases of long established atrial fibrillation when it is rarely possible to restore normal rhythm, the heart rate is controlled medically in order to improve its efficiency.

AETIOLOGY

6. Atrial fibrillation is essentially a manifestation of some underlying condition affecting the cardiac conductive and/or pacing mechanism.
7. The causes of atrial fibrillation include:
 - Valvular disease of the heart, especially rheumatic mitral valve disease.
 - Sino-atrial disease.
 - Coronary artery disease, especially acute myocardial infarction.
 - Congestive cardiac failure.
 - Cardiomyopathy (restrictive, hypertrophic or toxic e.g. alcoholic)
 - Congenital heart disease with atrial distension, e.g. atrial septal defect.
 - Retrograde activation, e.g. in the Wolff-Parkinson-White syndrome.
 - Hypertension with left ventricular hypertrophy.
 - Cardiac or thoracic surgery.
 - Infective causes, including myocarditis, pericarditis and pleuro-pericarditis which may occur in pneumonia.
 - Thyrotoxicosis.
 - Alcohol, tobacco or caffeine over-indulgences.
 - Digitalis toxicity
 - Pulmonary embolism.
 - Infiltration by tumour of the pericardium or heart muscle.
 - Patients with diabetes mellitus are also at increased risk of developing atrial fibrillation

8. In some cases of atrial fibrillation, no cause can be found and the condition is then termed **lone fibrillation**. Some authorities regard this as a phase of the tachycardia-bradycardia syndrome, in which there are alternating periods of slow and rapid heart rate.

COMPLICATIONS

9. Patients with atrial fibrillation are at risk of embolic complications. In those with rheumatic heart disease, there is a 17-fold increase in the risk of stroke. In association with non-rheumatic causes, the increased risk is 5-fold. In cases of "lone" fibrillation the risk is low.
10. In some cases, impairments in the mental functions of cognition, attention, memory or language can result from small emboli causing "silent strokes". In such cases, small infarcts can often be seen on CAT or MRI scanning of the brain.

CONCLUSION

11. Atrial fibrillation is an arrhythmia characterised by rapid, irregular, ineffective action of the atria of the heart. Conditions which are known to give rise to atrial fibrillation are listed at paragraph 7 above. In some cases no cause can be identified.

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