

sudden cardiac death  
[created by Paul Young 14/10/07]

general

- arbitrarily defined as death from a cardiac cause within 1 hour of symptom onset or without preceding symptoms
- sudden cardiac death can occur without previously identified heart disease; however, the strongest predictors are severity of left ventricular dysfunction
- large trials of ICD therapy have focussed on patients with LV dysfunction, coronary disease & spontaneous or inducible ventricular arrhythmias

pathophysiology

- arrhythmic causes of sudden cardiac death can be divided into three categories:
  1. primary VT / VF (most common)
  2. primary SVT with a very rapid ventricular response
  3. bradycardia or asystole
- usually associated with the development of AF or flutter in the presence of an accessory AV connection
- usually the result of an inadequate escape pacemaker mechanism associated with either a high degree AV block or severe sinus node dysfunction

aetiology

1. ischaemic heart disease:
  - acute myocardial ischaemia
  - old myocardial infarction scar
2. non-ischaemic heart disease:
  - cardiomyopathy
  - valvular heart disease
  - congenital heart disease
  - ventricular hypertrophy
  - cardiac trauma
3. no apparent structural heart disease
  - primary electrical disease
  - electrolyte abnormalities
  - prolonged QT syndromes
  - drugs

non-device therapy for prevention of sudden cardiac death

- general:
- antiarrhythmics retain a primary role among patients with a low risk of death
  - among high risk patients they are often used as an adjunct to ICD therapy
  - revascularisation is of primary importance in patients with coronary artery disease
- medication trials:
- (i) flecainide (Ic antiarrhythmic) is effective in suppression of ventricular ectopy but was shown to significantly increase mortality in the landmark Cardiac Arrhythmia Suppression Trials (CAST)
  - (ii) sotalol (which also has Ic properties) has also been evaluated in a randomised controlled trial and been shown to increase mortality
  - (iii) amiodarone has been shown to decrease the total, cardiac & sudden cardiac death rate among patients at risk of arrhythmogenic death
  - (iv) beta blockers clearly reduce the risk of death among patients with recent myocardial infarction & LV dysfunction
  - (v) statin use has been associated with a lower risk of sudden death in several studies
- catheter ablation:
- involves use of intracardiac catheters to induce VT, map pathological circuits & using radiofrequency energy to ablate small areas of tissue to interrupt the circuit
- lifestyle factors:
- tobacco avoidance, exercise, moderate alcohol consumption & a diet rich in fish are all protective from sudden cardiac death

implantable defibrillators

- trials have demonstrated:
1. reduction in 3-year mortality by 31% compared to antiarrhythmic drug therapy in averted sudden cardiac death
  2. reduced risk of death in patients with poor left ventricular function following myocardial infarction
  3. improved survival in patients with hypertrophic cardiomyopathy
  4. no survival benefit in high risk patients following CABG