Cocaine, alcohol & the heart

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Case Example

- Patient RC
- 28 yrs old
- Usually fit and well
- Cycles 10 miles + per week
- No past medical history
• 6 month history of increasing shortness of breath
• Noticed ankle swelling and feeling of fullness in abdomen; can’t lie flat without getting short of breath
• Lives with mother – she forces him to A&E
Echo’
Faced with potential heart transplant, therefore discussed ‘high risk’ causes of condition that would be screened:

- Drugs
- HIV/AIDS
- Iron overload
- Phaeochromacytoma
• Patient then sought a private consultation away from ward
• Admitted to using several grams of cocaine every weekend with alcohol
Cocaine & alcohol concurrent use is common
  – Social
  – Prolonged euphoria
  – Reduction in “crash”

Mediated via cocaethylene, a longer-acting metabolite
Alcohol & the heart

• Dilatation and reduced function described, but only in heavy drinkers...
• …often in conjunction with Atrial Fibrillation (an irregular, fast heart rhythm disorder) – **Holiday-heart syndrome**
Alcoholic Cardiomyopathy

- Nutritional Deficiencies (thiamine, selenium, zinc)
- Uncoupling of oxidative phosphorylation by fatty acid esters (non-oxidative metabolite)
- Genetic predisposition (ACE gene polymorphism)
- Effect of Acetaldehyde (oxidative metabolite)
  - Impaired excitation-contraction coupling
  - Inhibition of SR Ca^{++} release
  - Inhibition of protein synthesis
  - Oxidative stress
- Alcohol induced hypertension
- ? Apoptosis
- Activation of renal angiotensin system

Direct myocardial suppressant effects
Cocaine & the heart

**Acute**
- Promotes acute coronary blockage (‘coronary’ or ‘heart attack’)
- Via spasm
- ‘Sticky platelets’

**Chronic**
- ‘Poisoning of heart muscle’
- Fibrosis in heart chambers, myocyte loss
- May occur even in asymptomatic users
- Risk of arrhythmia
- Risk to foetal heart
Outcome of case

- Treated medically
  - Ramipril 10mg
  - Bisoprolol 2.5mg
  - Frusemide 80mg

Improved on the ward & discharged home after 1 week
• Normal heart function over next 2 years of follow up
• 100% abstinence from cocaine
• Mild alcohol intake resumed after 6 months with no ill effect
Questions?