Severe mental illness is associated with increased morbidity and mortality, primarily due to premature cardiovascular disease. The cardiovascular events are strongly linked to non-modifiable as well as modifiable risk factors, such as obesity, dyslipidemia, diabetes, hypertension and smoking (Saravane et al, 2009).

There is also evidence of an association between severe mental illness and the modifiable risk factors in heart disease. Indeed, studies have reported evidence of increased risk of heart disease in patients with depression (De Hert et al, 2009). Many psychotropic medications are also associated with ECG changes.

Evidence suggests that computerised readings of ECGs are not always accurate (Willems et al,1991). It is therefore essential that psychiatrists are aware of the potential adverse effects of psychotropic medication on the heart and that they improve their skills in reading and interpreting ECGs.

In this module, we discussed the normal findings of an ECG, ECG findings in angina and myocardial infarction, the effects of psychotropic medication on heart rate and blood pressure. We also discussed the use of antidepressant medications in coronary heart disease.

**ECG**

- Since computerised readings of ECGs are not completely reliable, it is important for psychiatrists to master the skill of reading and interpreting the ECGs.
- The ECG tracing is composed of the PQRS complex.
- The ECG is helpful to calculating the:
  - heart rate
  - rhythm
  - axis
  - intervals.
- In acute myocardial infarction there is elevation of the ST segment.

**Heart rate**

- Psychotropic medication can have effects on heart rate as well as on heart rate variation.
- It is important that regular physical examination should include the monitoring of heart rate.
- Heart rate variability (HRV) refers to beat-to-beat changes in heart rate as the heart responds to internal and external stimuli.
- HRV is an important non-invasive measure of cardiac autonomic nervous system responsivity.
- Patients with anxiety or depressive disorders have low heart rate variability and may be at increased risk for cardiovascular death associated with:
  - coronary heart disease
  - arrhythmias.
- Strategies for increasing HRV can be considered in consultation with the cardiologist.
Blood pressure

- Orthostatic hypotension is the most common and has the potential to be the most problematic psychotropic side effect, especially in the elderly and in those with pre-existing cardiovascular disease or autonomic nervous system dysfunction. These individuals need careful monitoring of their blood pressure, especially upon initiating psychotropic medication.

- Some psychotropic medication such as clozapine, duloxetine and venlafaxine are associated with hypertension, therefore care must be taken in patients who already have hypertension.

Antidepressants in coronary heart disease

- Depressive disorders are common in patients with coronary heart disease (CHD) and are a risk factor for cardiac morbidity and mortality in these patients.

- Psychiatrists and other physicians face many challenges while treating patients with CHD and depression.

- The use of tricyclic antidepressants (TCA) has been associated with increased risk of malignant ventricular arrhythmias and sudden cardiac death.

- SSRI antidepressants are safe and effective for the treatment of depression in patients with CHD. This particularly applies to sertraline, but other SSRIs are also likely to be safe.

Further reading

ECG Library (2011) A normal adult 12-lead ECG. [website]


Learntheheart.com (2011) ECG Basics. [website]