

Congestive heart failure, chronic kidney disease/insufficiency and anaemia are often present in the same patient.

Anaemia (hemoglobin <12.0g %) is often seen in congestive heart failure (CHF). It is associated with increased mortality (incidence of death), morbidity(disease events) and hospitalizations, and also associated with worse cardiac clinical status, more severe systolic and diastolic dysfunctions, a higher beta natriuretic peptide(BNP, a marker for heart muscle enzyme associated with heart failure) levels, increased extracellular and plasma volume, a more rapid deterioration of kidney function, a lower quality of life and increased medical costs.

Anaemia may also play a role in increasing cardiovascular morbidity in chronic kidney insufficiency, diabetes, renal(kidney) transplantations, asymptomatic left ventricular (LV) dysfunction, LV-hypertrophy, acute coronary syndromes including myocardial infarction,(MI ,heart attack) and chronic coronary heart disease.

The anemia in chronic heart failure (CHF) mainly is caused by a combination of renal failure (RF) and CHF- induced increased cytokine production and these can both lead to reduced production of EPO (a bone marrow stimulating substance) and resistance of the bone marrow to EPO stimulation, as well as to cytokine-induced iron deficiency anaemia caused by reduced intestinal absorption of iron and reduced release of iron from iron stores.

The use of angiotensin converting enzyme inhibitors (ACE inhibitors) and angiotensin receptor blockers (ARB) also may inhibit the bone marrow response to EPO.

Hemodilution caused by CHF may also cause low haemoglobin levels.

Renal failure, cardiac (heart) failure and anaemia therefore all interact to cause or worsen each other: the so-called cardio-renal-anaemia syndrome. Adequate treatment of all 3 conditions will slow down the progression of both the chronic heart failure (CHF) and the chronic kidney disease (CKD).

**See Heart Foundation Botswana Website for information on healthy eating, lifestyle and exercise for your heart.**

[www.hfb.org.bw](http://www.hfb.org.bw)