Foetal Haemoglobin (HbF)

Haemoglobin (Hb) is a protein in red blood cells that carries oxygen around our bodies. It is composed of iron and globin chains called alpha (α), beta (β), delta (δ) and gamma (γ). These globin chains combine to form different types of adult haemoglobin's – HbA (α2 β2), Hb A2 (α2δ2) and HbF (α2 γ2).

At birth, foetal haemoglobin (HbF) levels are high, but several months post birth the HbF level falls to <1% of the total detectable haemoglobin.

Inheritance of Foetal Haemoglobin

- A person normally inherits two alpha and two gamma genes (one from each parent), to produce the alpha & gamma globin proteins in haemoglobin F.
- A person may have a deletion or mutation in one of their two gamma globin or promotor genes.
- Raised HbF can be associated with other haemoglobinopathies, and this co-inheritance can potentially improve the clinical presentation of the disorder.
- Just like the genes that determine hair or eye colour, the gene for Hb F is inherited from one or both parents.

Causes of raised Foetal Haemoglobin (HbF)

Increased HbF levels in the adult may be:

- Inherited e.g., Hereditary Persistence Foetal Haemoglobin, Beta Thalassaemia, Delta Beta Thalassaemia.
- Acquired – Most common scenario & seen in multiple situations, including *e.g., pregnancy – HbF can be significantly increased in the 23 – 31 weeks of gestation (3 to 7 fold increase in the number of F-cells), some drug therapies, bone marrow failure syndrome(s).*

Detection

- (Usually found as an incidental finding)
- Can be identified via a haemoglobinopathy/thalassaemia screening blood test

NB Newborn infants normally have large amounts of HbF. Testing is therefore recommended (if needed) after 12 months of age.

Treatment

An isolated raised Hb F is a clinical *insignificant*, and so treatment for this condition is not required.

Raised Hb Fand family planning

If a raised HbF (greater than 5%), is seen in a pre or antennal situation, then partner haemoglobinopathy testing is advised.

Testing can be arranged by your local doctor. By testing we can determine whether there is a risk of having a child with a haemoglobinopathy/thalassaemia.

References:

Is elevated fetal haemoglobin a cause for concern in antenatal screening? - PHE Screening (blog.gov.uk)

For Medical Professionals seeking further information or advice, please contact Pathlab to discuss with one of our Haematologists: **07 858 0795**