Glucose-6-Phosphate Dehydrogenase (G6PD) Test

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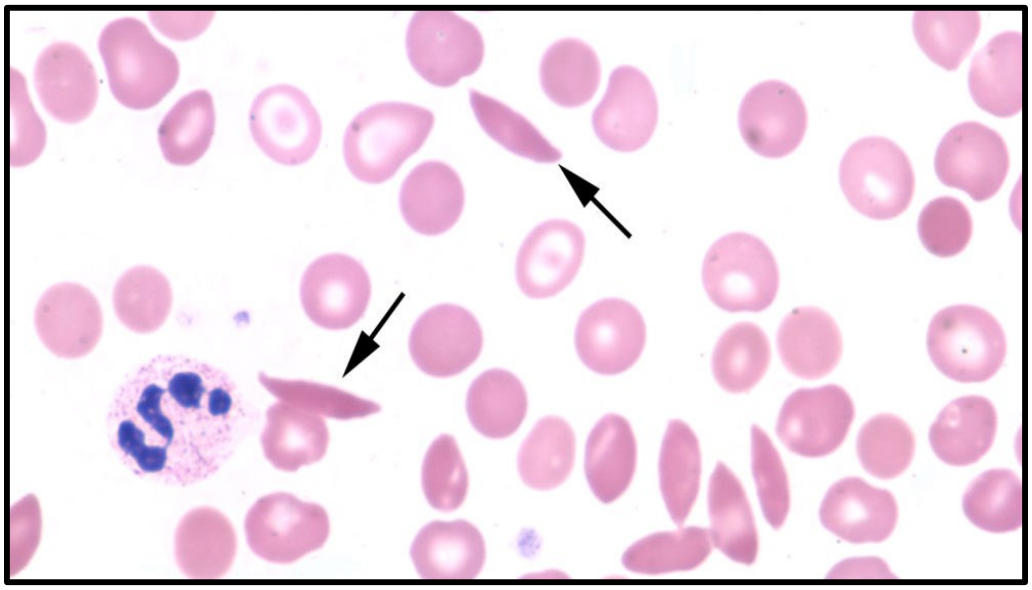
Glucose-6-Phosphate Dehydrogenase (G6PD) is an enzyme which protects the red blood cells and prevents them from being damaged.

This enzyme, which is active in virtually all types of cells, is involved in the normal processing of carbohydrates. It plays a critical role in red blood cells, which carry oxygen from the lungs to tissues throughout the body. This enzyme helps protect red blood cells from damage and premature destruction.



R B Cs abnormal

Glucose-6-phosphate dehydrogenase :

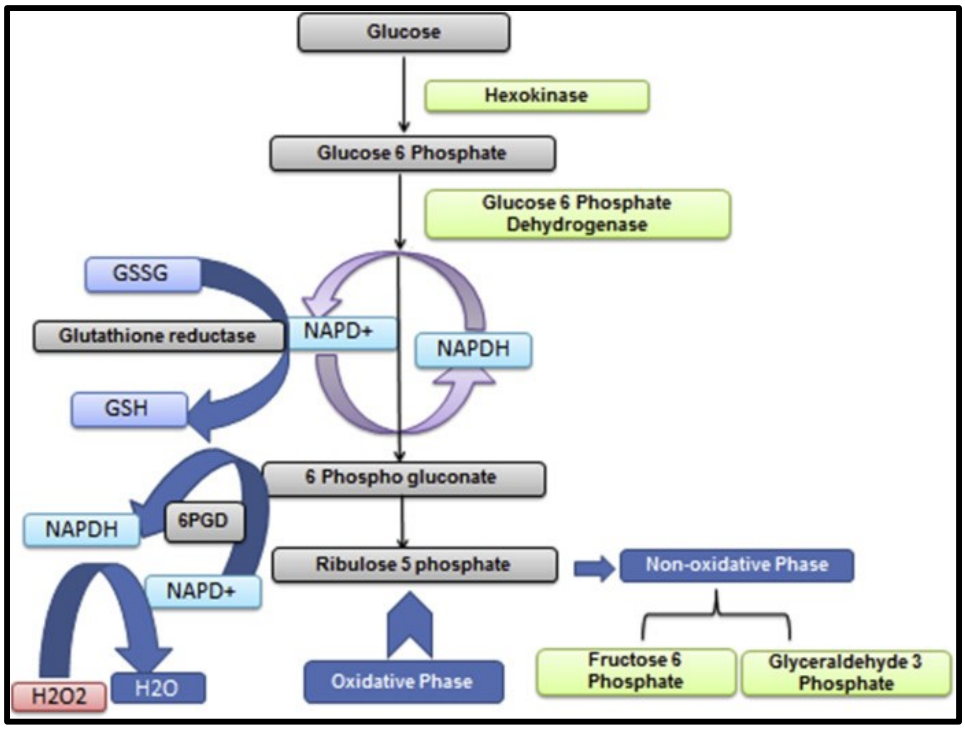
1- It is responsible for the first step in the pentose phosphate pathway

2- a series of chemical reactions that convert glucose (a type of sugar found in most carbohydrates) to another sugar, ribose-5-phosphate. Ribose-5-phosphate is an important component of nucleotides, which are the building blocks of DNA and its chemical cousin RNA.

3- This chemical reaction produces a molecule called NADPH, which plays a role in protecting cells from potentially harmful molecules called reactive oxygen species. These molecules are byproducts of normal cellular functions.

4- Reactions involving NADPH produce compounds that prevent reactive oxygen species from building up to toxic levels within cells.

5- The production of NADPH by glucose-6-phosphate dehydrogenase is essential in red blood cells, which are particularly susceptible to damage by reactive oxygen species because they lack other NADPH-producing enzymes.

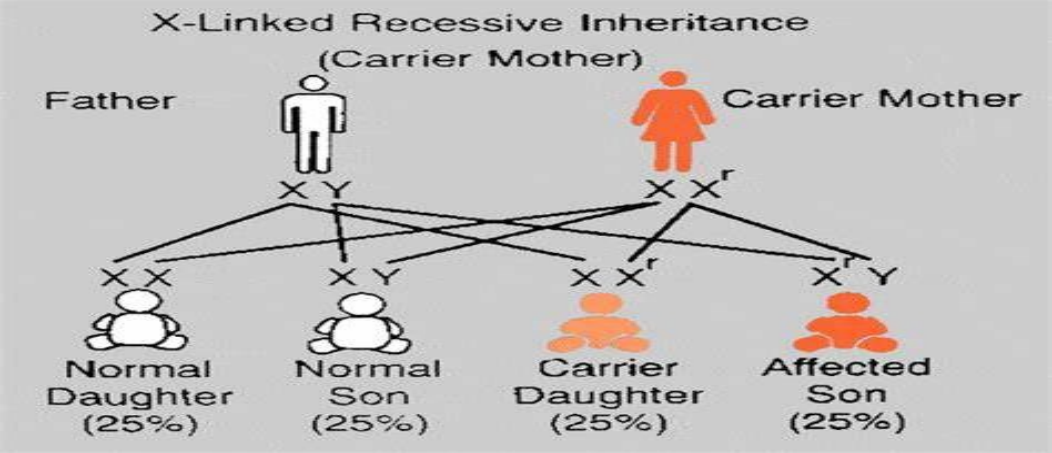


Role of Glucose-6-phosphate dehydrogenase

Causes G6PD deficiency

G6PD deficiency is a genetic condition that is passed along from one or both parents to their child. The defective gene that causes this deficiency is on the X chromosome, which is one of the two sex chromosomes. Men have only one X chromosome, while women have two X chromosomes. In males, one altered copy of the gene is enough to cause G6PD deficiency.

In females, however, a mutation would have to be present in both copies of the gene. Since it's less likely for females to have two altered copies of this gene, males are affected by G6PD deficiency much more frequently than females.



<u>The symptoms of G6PD deficiency:</u>

1. rapid heart rate
2. shortness of breath
3. urine that is dark or yellow-orange
4. fever,fatigue,dizziness,paleness.
5. jaundice.
6. Spleen enlargement.

Triggers of G6PD Deficiency :

- Certain foods (eg, eating broad beans) can lead to favism .
- Certain fever-reducing medicines and painkillers.
- Bacterial and viral infections.
- Certain medicines for treating malaria particularly which have "quine" in their names.
- Certain type of antibiotics, particularly those that have "sulf" in their names.
- Diabetic ketoacidosis.
- Acute kidney injury.

G6PD test

A G6PD test measures the levels of glucose-6-phosphate dehydrogenase (G6PD), an enzyme in the blood. An enzyme is a type of protein that's important for cell function.

G6PD helps red blood cells (RBCs) function normally. It also protects them from potentially harmful byproducts that can accumulate. A lack of G6PD may make RBCs more weak to breaking down in a process called hemolysis.

A G6PD test is a simple test that requires a blood sample. It's typically ordered to test for G6PD deficiencies.

What might affect my test results?

If the blood test is taken during, or just after, a hemolysis episode, the result could be falsely normal. The false-negative result could happen because most of the blood cells with greater G6PD deficiency (the older ones) have already been destroyed and the remaining blood cells are not yet, G6PD-deficient. If a false-negative result is suspected, a blood sample is checked again in about three months.