

HOMA Index

- **Insulin resistance** is becoming increasingly implicated in the pathogenesis of type 2 diabetes, hypertension, hyperlipidaemia, vascular disease, obesity, polycystic ovarian syndrome (PCOS) and recurrent miscarriage

What is insulin resistance?

- Insulin resistance is defined as a reduced tissue response to the effects of insulin on glucose metabolism
- This leads to reduced glucose uptake in muscle and fat tissue, reduced liver glycogen formation and accelerated liver glucose production

What are the effects of insulin resistance?

- The physiological response to insulin resistance is to increase pancreatic insulin secretion to increase glucose uptake into muscle and fat tissue, and to inhibit liver glucose production to maintain blood glucose levels
- Therefore, insulin resistance usually leads to high levels of insulin in the blood —hyperinsulinaemia
- Finally, depending on coexisting genetic, lifestyle and environmental factors, pancreatic insulin secretion may fail after decades of hypersecretion and type 2 diabetes will develop

How is insulin resistance detected?

- Insulin resistance test detects hyperinsulinemia (increased insulin levels in blood)
- It is detected by HOMA Index (Homeostasis Model Assessment)
- HOMA is calculated from blood glucose and insulin levels

Why is testing for insulin resistance important?

- Hyperinsulinaemia is present 10-40 years before loss of insulin secretion occurs, leading to the development of impaired glucose tolerance and then type 2 diabetes
- It is highly likely that intervention at a stage of normal glucose tolerance but hyperinsulinaemia would be even more effective
- In PCOS — a condition where most women have been shown to be insulin resistant — lifestyle measures have been shown in small studies to markedly improve outcomes

Serum Insulin levels

- The simplest way to diagnose insulin resistance in the clinical setting is the fasting serum insulin
- However, this test can be inaccurate as the insulin secretion is pulsatile
- Also, this test becomes inaccurate as insulin secretion falls and impaired glucose tolerance and type 2 diabetes develop

Advantages of HOMA

- Less invasive than OGTT (In OGTT 5 samples are required at half hour intervals)
- Values are not affected by the pulsatile secretion of insulin