

UK Prevalence of Diabetes Mellitus

- Estimated that 1.4 million people in the UK have diabetes mellitus
 - Up to 1.25 million have Type 2 diabetes
 - 0.15 million have Type 1 diabetes
- A new patient is diagnosed with Type 2 diabetes every 5 minutes
- There may be as many as 1 million undiagnosed cases

definition

- Diabetes is a group of condition characterised by chronically raised plasma glucose levels. Due to the absolute or relative lack of insulin.

Patient Profiles & Groups at Higher Than Average Risk

- 1) Relative (parent or sibling) with Type 2 diabetes
- 2) Certain high risk ethnic groups
- 3) Middle-aged or older
- 4) Impaired glucose tolerance or impaired fasting glucose
- 5) Obesity (especially visceral adiposity) or waist > 88cm♀ and >90cm Asian ♂ and >102cm White/Black
- 6) Sedentary lifestyle
- 7) birth weight (low or high)
- 8) Smoking



Microvascular and Macrovascular complications

Nephropathy

- Cumulative figure around 30-35%, but most Type 2 individuals will not reach ESRF.

Neuropathy

- All neuropathies up to 50% after 20 years (i.e both peripheral and autonomic).

Retinopathy

- Single biggest cause of blindness in working population. 90% of Type 1 and 60% of Type 2 will have some level of retinopathy after 20 years.

Cardiovascular disease

- **Kills 75% of all people with diabetes with MIs accounting for 30% of deaths.**

Macrovascular Complications

- Type 2 diabetes is a strong risk factor for CV disease in both men and women.
- Normal protection afforded to pre-menopausal women is negated by diabetes.
- Risk of atherosclerotic cardiovascular disease is 2-4 times higher for those with Type 2 diabetes compared to non diabetic population.
- CHD is the principle cause of death in people with diabetes.
- People with diabetes have the same risk as those without diabetes but who have had an MI.

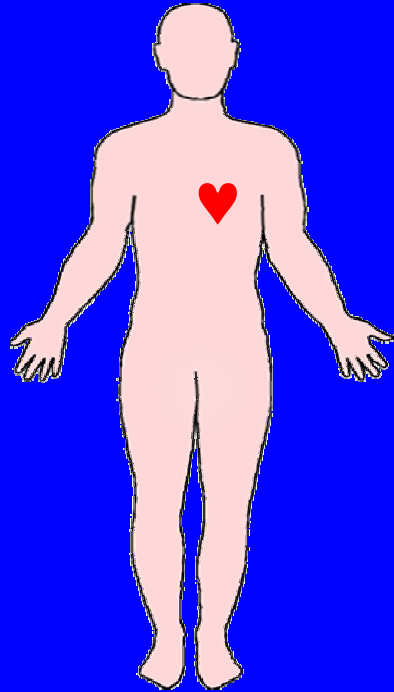
Complications at Diagnosis

- 50% of newly presenting people with type 2 diabetes already have one or more complications at diagnosis.

| | |
|------------------------------------|-----|
| Hypertension | 35% |
| Retinopathy | 21% |
| Erectile Dysfunction | 20% |
| Abnormal ECG | 18% |
| Ischaemic changes to feet | 6% |
| Intermittent claudication | 3% |
| Plasma creatinine >120 μ mol/l | 3% |
| Stroke or TIA | 1% |

Why do Patients With Type 2 Diabetes Develop Cardiovascular Disease?

Type 2 Diabetes



Risk

Obesity

Hypertension

Raised LDL cholesterol

Low HDL cholesterol

Hypertriglyceridaemia

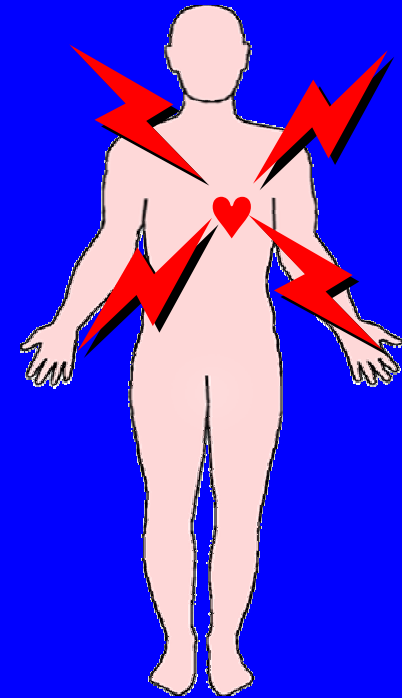
Insulin resistance

Clotting disorders

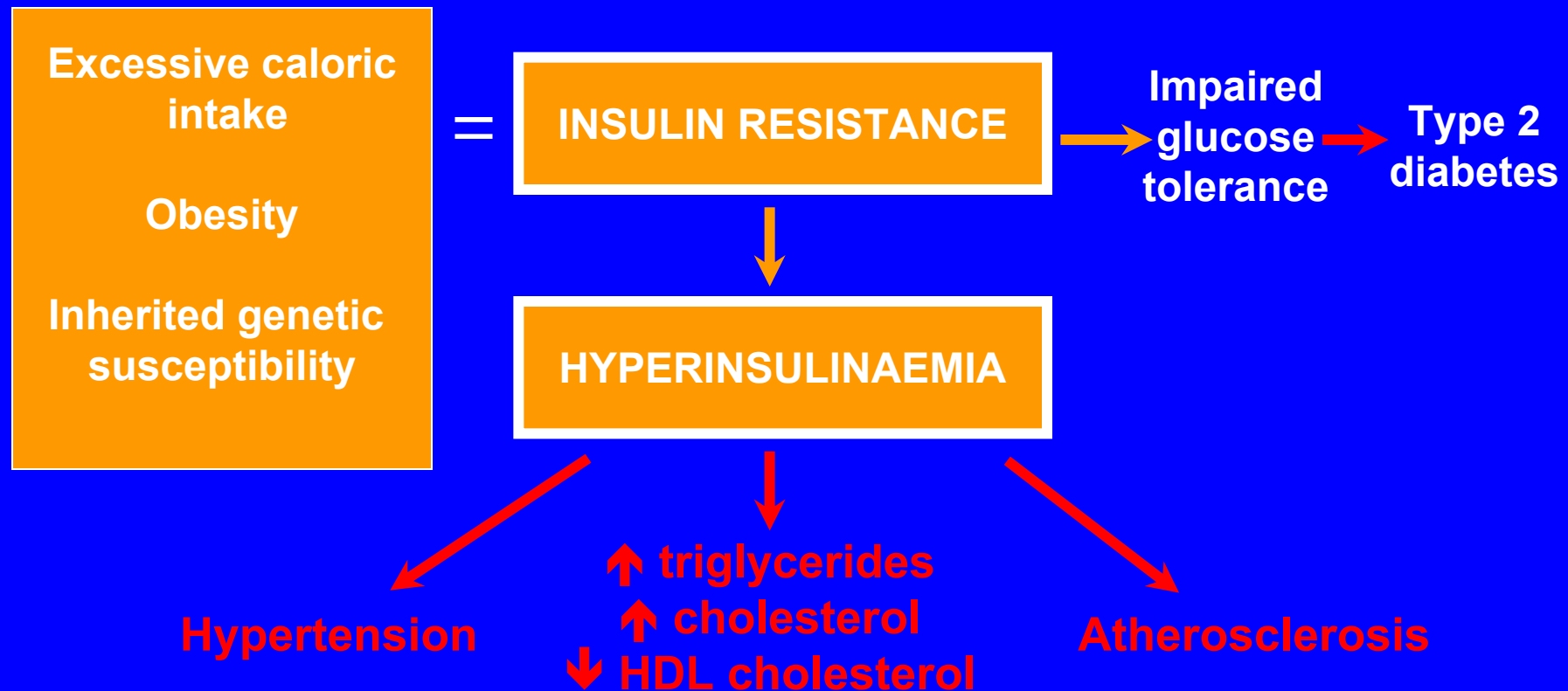
Type 2 diabetes

Hyperinsulinaemia

Cardiovascular Disease



Hypothesised Role of Insulin Resistance in the Metabolic Syndrome



Adapted from Bailey C. British Journal of Cardiology
2000;7(6):350–360

DeFronzo RA, Ferrannini E. Diabetes Care 1991;14(3):173–194

Main modifiable risk factors

- Hyperglycaemia.
- Hypertension.
- Dyslipidaemia.
- Cigarette smoking
- Excess visceral adiposity
- Lifestyle:

Alphabet strategy

Advice

- Education Regarding Diet, Medication, Smoking Cessation, Alcohol, Weight Reduction And Healthy Eating

Blood Pressure

- Aggressive Control Of Any BP > 130/80

Cholesterol

- Treat As Secondary Prevention
- Aim: Total Cholesterol ≥ 4.0

Diabetes Control

- AIM: HBA1c $\geq 6.5\%$ - 7.5% Were Realistic

Alphabet strategy

EYE SCREENING

FEET SCREENING

GUARDIAN DRUGS

- Aspirin 75 mg once daily for those aged 50 and over, with Type 2 diabetes, with a blood pressure controlled to <150/90 mmHg (NICE suggest <145 systolic).
- ACE inhibitors and angiotensin II have special role in prevention of diabetic nephropathy.

Drug safety

ACE Inhibitors & AT2 Blockers

- Often protective in diabetic nephropathy
- May worsen renal failure
- Especially if renal artery stenosis
- Monitor renal function 2 weeks after starting ACEI/AT2B or increase in dose
- Stop if
 - creatinine $\uparrow > 20\%$ or
 - eGFR $\downarrow > 15\%$

Drug safety

Metformin & Heart Disease

- Decompensated heart failure =
- Poor tissue perfusion \Rightarrow
- \uparrow Tissue hypoxia \Rightarrow
- \uparrow Production of lactic acid
- Avoid metformin in
 - Poorly controlled CCF/LVF
 - Ejection fraction $< 25\%$ on echocardiogram

Drug safety

Glitazones & Heart Disease

- Glitazone adverse effects
 - Oedema, pulmonary oedema, anaemia, dyspepsia, wt gain, headache
- Avoid glitazones in known LVF/CCF patients
- Proactive trial – Pioglitazone and CVD
 - ↑ Hospital admissions with heart failure

Pregnancy

Women with pre-existing diabetes of child bearing age should be advised to seek preconception advice prior to becoming pregnant so that:-

- glycaemic control can be optimised.
- medication be reviewed and changed to safer formulation.
- screened for undiagnosed cardiac or renal disease.

Insulin post MI?

- The Diabetes Mellitus Insulin-Glucose Infusion in Acute Myocardial Infarction (DIGAMI, 1995) trial, this study attempted to evaluate the influence of intensive insulin therapy on morbidity and mortality of diabetic patients with MI. the first to show such a large reduction in mortality for diabetic patients with MIs at 1 year
- Not replicated in DIGAMI 2 (2204), perhaps the most important message from DIGAMI 2 is that in well-controlled diabetes, cardiovascular outcomes are similar to those in a non-diabetic population

Summary

For Groups at Risk Diabetes

- Screening of impaired glucose regulation - Lifestyle changes reduced the risk of getting Type 2 diabetes by 58%.
(diabetes prevention programme)

Summary

For People With Diabetes

- Patient Education and empowerment and annual review, aimed at prevention, early detection and evidence based treatment
- Glycaemic control- ↓ retinopathy, ↓ Nephropathy
- Lipid management - ↓ macrovascular
- Blood pressure - ↓ macrovascular
- Smoking cessation - ↓ macrovascular
- **Weight management:** In obese people an 11% loss of initial body weight is associated with:
 - 25% reduction in total mortality
 - 28% reduction in CVD and diabetes