Type II Diabetes: Awareness, Prevention & Management through Physical Activity

Wednesday 26th May 2010
What is Diabetes?

- Diabetes is a chronic metabolic disease characterised by deficiency of insulin leading to hyperglycaemia (high blood sugar levels).

- Insulin insufficiency reduces body’s ability to use glucose as fuel and transport to muscles, therefore accumulates in blood.
General Statistics

• Not uncommon
  - Fastest growing chronic disease
  - 1 person diagnosed every 7 minutes
  - WHO estimates that in 2025, over 300 million people worldwide will have diabetes
  - Currently 246 million worldwide; 3 million Australians

• This means there will be a huge increase in death by cardiovascular death

• Very manageable, however if not well managed may lead to major problems
- 6th highest cause of death in Australia by disease
- People with diabetes are twice as likely to have increased BP and elevated blood fats as well as increased risk of CVD
- In 2005, 65 amputations per day due to diabetes, 38700 eye complications

• Don’t be frightened - as long as blood glucose is managed well and maintained within a healthy range, diabetics can live quite comfortably with little upsets
## Types of Diabetes

<table>
<thead>
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<th>Type I</th>
<th>Type II</th>
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<td>Absolute deficiency of insulin</td>
<td>Relative insulin deficiency</td>
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<td>Reduced number of beta cells in pancreas that secrete insulin</td>
<td>Defective insulin secretion: Insulin resistance → glucose does not easily enter insulin sensitive tissues = ↑ blood glucose</td>
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<td>Insulin Injections Required</td>
<td>Physical Activity &amp; Dietary Modifications</td>
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Type II Diabetes accounts for 85-90% of Diabetes within the population
Diet, exercise, stress and medications may all affect blood glucose levels. Problems in any of these areas may cause blood glucose levels to become too low or too high.
Impaired Glucose Tolerance

- The beginning of diabetes
- Fasting plasma glucose lower than diabetic levels ie. 2hr oral glucose tolerance test (OGTT) is greater than normal but less than diabetic
- IGT → ↑ risk of developing diabetes but progression not certain
- Main objective is to prevent progression to type 2
- Normal → fasting <110mg.dl or 6.11mmol/L
  2hr plasma glucose <140mg.dl or 7.77mmol/L
- Diabetic → fasting >125mg.dl or 6.94mmol/L
  2hr plasma glucose >200mg.dl or 11.11mmol/L
Risk Factors

- Over 45 years of age
- Male
- Asian, Latin, Pacific Island or Aboriginal heritage
- Overweight
- A close relative such as father, brother or sister who has or had diabetes
- Having had diabetes during pregnancy
- Hypertension
Complications Associated with Type II Diabetes

• Hypertension: high blood pressure due to:
  – Poor diet
  – Lack of physical activity

• Hyperglycaemia: high plasma glucose concentration due to:
  – Insulin insensitivity
  – Poor regulation
  – Poor diet
  – Lack of physical activity
• Hypoglycaemia: low plasma glucose concentration due to:
  – Over-medication
  – Abnormal amount of physical activity
  – Insufficient CHO intake or skipping meals

• Retinopathy: microaneurysm of retinal capillaries due to:
  – Poor glucose control
  – Continued high glucose concentration in the blood causes walls of retina to breakdown
  – Can result in haemorrhaging, scarring, detachment and eventually blindness
• Neuropathy: loss of nerve fibre due to:
  – Poor circulation as a result of poor glycaemia control
  – Poor foot care resulting in ulcers and sores
• Nephropathy: long term damage to kidneys due to:
  – Unstable blood glucose
  – Overloading of kidneys as a result of excess filtration at the glomerulus
• Obesity: excess adiposity due to:
  – Lack of physical activity
  – Poor diet
Healthy Eating For Diabetes

• Following a healthy eating plan & doing regular physical activity is the key to managing your blood glucose (sugar) levels and body weight.

• Healthy eating is good for everybody, you do not need to buy special foods or prepare separate meals for you & your family!
The AGTHE

Eating habits recommended for Diabetics are the same as the general population.

To help manage your diabetes, your meals need to be:

- Spaced regularly and evenly throughout the day.
- Low in fat, especially saturated fat.
- Based on high fibre carbohydrate foods such as whole grain breads & cereals, beans lentils vegetables & fruits.
• The increased incidence of diabetes around the world is directly linked to the rate of weight gain globally, but research shows even modest weight loss can make a big difference.

• People with diabetes who are also obese are more likely to have poorer control over their blood sugars than those who are not overweight & to have more problems with high BP & elevated cholesterol levels.

• The combination of excess weight and diabetes is also associated with a greater risk for cardiovascular disease and developing complications from the diabetes, such as blindness and kidney disease.

• The National Heart Foundation & Diabetes Australia recommend people diagnosed with diabetes lose weight to reach a healthy body weight (i.e., a Body Mass Index, or BMI of 25 or less).
Energy Balance = BUDGET!

• Energy in > Energy out = Weight gain

• Energy in < Energy out = Weight loss

• Energy in = Energy out = Weight maintenance

Don’t forget the importance of regular physical activity!
Hints For Shopping

• Never go shopping when you are hungry!
• Always make a shopping list (stick to the perimeter)
• Shop once per week for dry groceries & 2-3 times per week for milk, bread, fruit, & vegetables (fresh is best!)
• Buy fruit & vegetables in season
• Read labels and check the weights/serving sizes
Importance of Diet & Exercise

• Need to exercise in order to maintain muscle mass to drive metabolism. If lose muscle mass along with adipose tissue, metabolism will slow down and eventually will put excess weight back on plus more.

• Max 0.5-1kg weight loss per week
Exercise Guidelines


• ≥30mins of moderate PA on most if not all days of the week
• 150 mins/wk
• May be accumulated in 10min bouts
• Mod intensity = brisk walk (should find somewhat hard, increased respiration/breathing rate but still be able to maintain conversation)
• Vigorous intensity = jogging. You should be puffing now and unable to maintain conversation
• Resistance training 3 times per week
Benefits of Exercise

• ↑ blood glucose (BG) control (type 2)

• (NB. BG level <250mg.dl and no ketones for safe exercise)

• ↑ insulin sensitivity and ↓ medication requirement

• Improves body composition and reduces body weight. ↓ body fat. → weight loss ↑ insulin sensitivity and allows ↓ in meds. Exercise and moderate calorie intake is most effective way to lose weight

• ↓ risk of CVD (cardiovascular disease)

• ↓ stress → can disrupt diabetes control by ↑ counter-regulatory hormones, ketones, FFA and urinary output
• Prevents progression of diabetes (reduce incidence by 58%)

• Improves BLP (blood lipid profile)

• Improves BP (blood pressure)

• Improves vascular, cardiorespiratory and myocardial function (ie. heart, lungs and blood vessels become more efficient)

• Improves circulation (blood delivery to peripheries)

• Increased muscle hypertrophy and capilerisation (as diabetics tend to have poor blood flow)

• More restful sleep
• More energy

• Stronger bones

• Opportunity for social contact

• Reduces bone loss

• Maintains independence and quality of life

• Relieves anxiety and depression
Components of Fitness

Cardio respiratory/aerobic

- increases your lung capacity and ability to exercise for longer
  eg. walking, tennis, swimming, golf, cycling, lawn bowls

Muscular Strength

- allows you to lift, push or pull large forces
  eg. weights, pilates, hydrotherapy
Muscular Endurance

• enables your muscles to keep moving or exercising for long periods of time

eg. weights, pilates, walking, hydrotherapy

Flexibility

• helps keep muscles long and lean to prevent tightening, spasm & cramping

eg. stretching, yoga, pilates
Safety Precautions

- Keep rapidly acting CHO available during exercise (jelly beans, soft drink, fruit)

- Consume adequate fluids before, during and after exercise

- Good foot care, proper shoes, cotton socks

- Medical identification
Diabetes Education & Physical Activity Program

- 8 week program conducted by one of our Accredited Exercise Physiologists and an Accredited Dietician

- The program will include:
  - Self management strategies
  - Goal setting
  - Exercise advice and practice
  - Diet and meal planning advice
Next Course

• 20 July – 7 September 2010
• When: Tuesday 6pm – 8pm
• Where: UQ Inter-Professional Clinics, Building 21C
• Cost: If referred under a GP management Plan the program is free.
  • If you are not under a plan the program is $187.90 for 8 weeks and the initial health assessment
More Information

• If you would like more information regarding the program please contact the Inter-Professional Clinics on:

• Ph: (07) 3346 3241
• Email: clinics@uqs.com.au