CME CATEGORY IIIA – SELF STUDY

A SELECTION OF TEN CURRENT READINGS ON DIABETES MELLITUS

Selection of readings made by A/Prof Goh Lee Gan

CURRENT UNDERSTANDING

Reading 1

Sivitz WI. Understanding insulin resistance. What are the clinical implications? Postgrad Med. 2004 Jul;116(1):41-8.

http://www.postgradmed.com/issues/2004/07_04/sivitz.htm (free full text)

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SUMMARY

Insulin resistance is often considered a central component of metabolic syndrome, now a well-recognized clinical problem that significantly increases the risk of cardiovascular morbidity and mortality. In fact, among other names, metabolic syndrome has been referred to as insulin resistance syndrome. This paper discusses the definition and identification of insulin resistance, the underlying mechanisms involved in insulin resistance, the issues surrounding assessment, and the implications for management in patients in whom insulin resistance is either detected or suspected.

Reading 2

Nelson MR. Managing 'metabolic syndrome' and multiple risk factors. Aust Fam Physician. 2004 Apr;33(4):201-5.

http://www.racgp.org.au/afp/downloads/pdf/april2004/20040413nelson.pdf (free full text)

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ABSTRACT

BACKGROUND. Risk factors tend to cluster and are shared across common diseases seen in general practice. The 'metabolic syndrome' is a cluster of fasting hyperglycaemia, abdominal adiposity, dyslipidaemia and hypertension. This syndrome is associated with both insulin resistance and behaviourally modifiable risk factors such as smoking, physical activity and unhealthy diet.

OBJECTIVE. This article aims to provide pragmatic guidance on conditions that are lifestyle based and present as a number of disease states that require multiple interventions. Management of comorbidity and multiple risk factors is discussed using a case vignette.

DISCUSSION. Metabolic disease states have common bases and their management is directed toward identifying all the risk factors, establishing absolute risk and intervening sequentially.

Reading 3

Norman RJ, Wu R, Stankiewicz MT. Polycystic ovary syndrome. Med J Aust. 2004 Feb 2;180(3):132-7.

http://www.mja.com.au/public/issues/180_03_020204/nor10314_fm.html (free full text)

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ABSTRACT

Polycystic ovary syndrome (PCOS) is a common condition characterised by menstrual abnormalities and clinical or biochemical features of hyperandrogenism. Features of PCOS may manifest at any age, ranging from childhood (premature puberty), teenage years (hirsutism, menstrual abnormalities), early adulthood and middle life (infertility, glucose intolerance) to later life (diabetes mellitus and cardiovascular disease). While pelvic ultrasound examination is useful, many women without PCOS have polycystic ovaries; ultrasound evidence is not necessary for the diagnosis. Testing for glucose intolerance and hyperlipidaemia is wise, especially in obese women, as diabetes mellitus is common in PCOS. Lifestyle changes as recommended in diabetes are fundamental for treatment; addition of insulin-sensitising agents (e.g., metformin) may be valuable in circumstances such as anovulatory infertility. Infertility can be treated successfully in most women by diet and exercise, clomiphene citrate with or without metformin, ovarian drilling, or ovulation induction with gonadotrophins; in-vitro fertilisation should be avoided unless there are other indications.

SCREENING

Reading 4

Rao SS, Disraeli P, McGregor T. Impaired glucose tolerance and impaired fasting glucose. Am Fam Physician. 2004 Apr 15; 69(8):1961-8.

http://www.aafp.org/afp/20040415/1961.html (free full text)

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ABSTRACT

Impaired glucose tolerance and impaired fasting glucose form an intermediate stage in the natural history of diabetes mellitus. From 10 to 15 percent of adults in the United States have one of these conditions. Impaired glucose tolerance is defined as two-hour glucose levels of 140 to 199 mg per dL (7.8 to 11.0 mmol) on the 75-g oral glucose tolerance test, and impaired fasting glucose is defined as glucose levels of 100 to 125 mg per dL (5.6 to 6.9 mmol per L) in fasting patients. These glucose levels are above normal but below the level that is diagnostic for diabetes. Patients with impaired glucose tolerance or impaired fasting glucose have a significant risk of developing diabetes and thus are an important target group for primary prevention. Risk factors for diabetes include family history of diabetes, body mass index greater than 25 kg per m2, sedentary lifestyle, hypertension, dyslipidemia, history of gestational diabetes or large-for-gestational-age infant, and polycystic ovary syndrome. Blacks, Latin Americans, Native Americans, and Asian-Pacific Islanders also are at increased risk for diabetes. Patients at higher risk should be screened with a fasting plasma glucose level. When the diagnosis of impaired glucose tolerance or impaired fasting glucose is made, physicians should counsel patients to lose 5 to 7 percent of their body weight and engage in moderate physical activity for at least 150 minutes per week. Drug therapy with metformin or acarbose has been shown to delay or prevent the onset of diabetes. However, medications are not as effective as lifestyle changes, and it is not known if treatment with these drugs is cost effective in the management of impaired glucose tolerance.

Reading 5

Colagiuri S, Hussain Z, Zimmet P, Cameron A, Shaw J; AusDiab. Screening for type 2 diabetes and impaired glucose metabolism: the Australian experience. Diabetes Care. 2004 Feb;27(2):367-71.

http://care.diabetesjournals.org/cgi/content/full/27/2/367 (paid full text)

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ABSTRACT

OBJECTIVE: To assess the Australian protocol for identifying undiagnosed type 2 diabetes and impaired glucose metabolism.

RESEARCH DESIGN AND METHODS: The Australian screening protocol recommends a stepped approach to detecting undiagnosed type 2 diabetes based on assessment of risk status, measurement of fasting plasma glucose (FPG) in individuals at risk, and further testing according to FPG. The performance of and variations to this protocol were assessed in a population-based sample of 10,508 Australians.

RESULTS: The protocol had a sensitivity of 79.9%, specificity of 79.9%, and a positive predictive value (PPV) of 13.7% for detecting undiagnosed type 2 diabetes and sensitivity of 51.9% and specificity of 86.7% for detecting impaired glucose tolerance (IGT) or impaired fasting glucose (IFG). To achieve these diagnostic rates, 20.7% of the Australian adult population would require an oral glucose tolerance test (OGTT). Increasing the FPG cut point to 6.1 mmol/l (110 mg/dl) or using HbA(1c) instead of FPG to determine the need for an OGTT in people with risk factors reduced sensitivity, increased specificity and PPV, and reduced the proportion requiring an OGTT. However, each of these protocol variations substantially reduced the detection of IGT or IFG.

CONCLUSIONS: The Australian screening protocol identified one new case of diabetes for every 32 people screened, with 4 of 10 people screened requiring FPG measurement and 1 in 5 requiring an OGTT. In addition, 1 in 11 people screened had IGT or IFG. Including HbA(1c) measurement substantially reduced both the number requiring an OGTT and the detection of IGT or IFG.

Reading 6

Ealovega MW, Tabaei BP, Brandle M, Burke R, Herman WH. Opportunistic screening for diabetes in routine clinical practice. Diabetes Care. 2004 Jan; 27(1):9-12.

http://care.diabetesjournals.org/cgi/content/full/27/1/9 (paid full text)

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ABSTRACT

OBJECTIVE: Since 1997, the American Diabetes Association has recommended that nondiabetic individuals >/=45 years of age be screened for diabetes at least every 3 years. We sought to characterize the frequency, methods, and results of diabetes screening in routine clinical practice.

RESEARCH DESIGN AND METHODS: We studied opportunistic screening in nondiabetic members of a health maintenance organization >/=45 years of age who were assigned to a large, integrated, academic health care delivery system. Screening was defined as the first glucose, HbA(1c), or oral glucose tolerance test (OGTT) performed between 1 January 1998 and 31 December 2000. Chart review was performed to determine the prevalence of diabetes risk factors and to describe follow-up.

RESULTS: Of 8,286 nondiabetic patients >/=45 years of age, 69% (n = 5,752) were screened. The frequency of screening was greater in patients with one or more primary care visits and increased with age. Women were more

likely to be screened than men, and patients with at least one diabetes risk factor were more likely to be screened than those without risk factors. Random plasma glucose was the most common screening test (95%). Four percent (n = 202) of those screened had abnormal results. Only 38% (n = 77) of those with abnormal results received appropriate follow-up, and 17% (n = 35) were diagnosed with diabetes within 6 months of screening. The yield of screening was very low (0.6%, 35 of 5,752).

CONCLUSIONS: Despite frequent screening and appropriate targeting of high-risk patients, follow-up of patients with abnormal results is uncommon and the yield of screening is low. Interventions are needed to help physicians recognize and provide appropriate follow-up for patients with potentially abnormal random glucose levels.

THERAPY & MANAGEMENT

Reading 7

Davis TM, Colagiuri S. The continuing legacy of the United Kingdom Prospective Diabetes Study. Med J Aust. 2004 Feb 2;180(3):104-5.

http://www.mja.com.au/public/issues/180_03_020204/dav10798_fm-2.html (free full text)

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SUMMARY

The United Kingdom Prospective Diabetes Study (UKPDS) provided definitive evidence for the benefit of intensive management of blood glucose level and blood pressure in people with type 2 diabetes[1,2]. When the main findings of the UKPDS were published in 1998, a year after the study had closed, several questions arose. How much would the UKPDS findings influence usual care? Would the vascular benefits of intensive therapy be sustained? Would the status of borderline or unexpected results change with longer observation? To answer these questions, post-study monitoring was initiated after completion of the UKPDS. All patients stopped protocol-driven management but were asked to participate in further regular assessment. The 5-year post-study monitoring period ran from September 1997 to September 2002. Five years after the completion of the study, some of its benefits have been maintained.

Reading 8

Nisbet JC, Sturtevant JM, Prins JB. Metformin and serious adverse effects. Med J Aust. 2004 Jan 19; 180(2):53-4.

http://www.mja.com.au/public/issues/180_02_190104/nis10631_fm-2.html (free full text)

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SUMMARY

Metformin has been used in the treatment of type 2 diabetes for nearly 50 years. It acts as an insulin-sensitising agent, lowering fasting plasma insulin concentrations by inducing greater peripheral uptake of glucose, as well as decreasing hepatic glucose output. It is the oral hypoglycaemic agent of choice in the treatment of overweight people with type 2 diabetes. More recently, the use of metformin has broadened, with evidence for its benefit in other insulin-resistant states. In polycystic ovary syndrome, metformin decreases insulin resistance, restores ovulatory

menses, facilitates conception, and reduces the rate of first-trimester spontaneous abortion. Metformin also delays progression to type 2 diabetes in people with impaired glucose tolerance. It is currently being evaluated in the treatment of gestational diabetes mellitus, and has shown promising results in selected individuals with type 1 diabetes. But this increase in the use of metformin is not without risk. The manufacturer's product information on metformin reminds prescribers that life-threatening lactic acidosis can occur, caused by accumulation of metformin, and that risk factors for this include renal impairment, old age and doses over 2 g per day. Metformin must be prescribed appropriately to avoid potential adverse effects, while offering patients the best treatment possible. In well, ambulatory patients, renal function should be monitored regularly. A cut-off serum creatinine concentration above which metformin should be discontinued has been arbitrarily set at 0.15 mmol/L. Without doubt, metformin remains the drug of choice for most patients with type 2 diabetes. Careful and thoughtful use of this drug has the potential to avoid life-threatening adverse events.

Reading 9

Koenigsberg MR, Bartlett D, Cramer JS. Facilitating treatment adherence with lifestyle changes in diabetes. Am Fam Physician. 2004 Jan 15; 69(2):309-16.

http://www.aafp.org/afp/20040115/309.pdf (free full text)

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SUMMARY

Healthy eating and increased physical activity can prevent or delay diabetes and its complications. Techniques that facilitate adherence to these lifestyle changes can be adapted to primary care. Often, the patient's readiness to work toward change must be developed gradually. To prepare patients who are reluctant to change, it is effective to assess and address their conviction and confidence. Patients facing the long-term task of making lifestyle changes benefit from assistance in setting highly specific behavior-outcome goals and short-term behavior targets. Individualization is achieved by tailoring these goals and targets to the patient's preferences and progress, building the patient's confidence in small steps, and implementing more intensive interventions according to a stepped-care model. At each office visit, physician follow-up of the patient's self-monitored goals and targets enhances motivation and allows further customization of the plan. A coaching approach can be used to encourage positive choices, develop self-sufficiency, and assist the patient in identifying and overcoming barriers. More intensive intervention using a team approach maximizes adherence.

Reading 10

Ogrinc G, Mutha S. A one-stop health care request. Am Fam Physician. 2004 Feb 1; 69(3):750-2.

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SUMMARY

Providing care to a transient visitor with a chronic disease is a difficult proposition. While many physicians want to make decisions guided by the best evidence, this scenario is one of many in medicine where physicians must rely on clinical intuition. A patient-centered approach with culturally appropriate care and evidence-based disease management is suggested using the Institute of Medicine's (IOM's) "new rules" for health care as a guide.
