

FACT SHEET

Diabetes in Singapore

In Singapore, despite various campaigns aimed at lifestyle modification to prevent diabetes, the prevalence of diabetes in the country continues to rise. According to the National Health Survey in 2004, the prevalence of diabetes was 8.2% among Singaporeans aged 18 to 69 years; in 2010, the prevalence was 11.3%. Apart from the high prevalence of diabetes in the nation, early detection of diabetes itself is very important as nearly half the diabetics (51.4% according to NHS 2010) were unaware that they had diabetes at the time of the Survey.

Complications of Diabetes

Diabetes can lead to many complications, including kidney disease which can lead to ESRD, heart disease, stroke, eye disease that can lead to blindness and diabetic limb disease that can lead to amputations. Among these complications, kidney disease is the most common complication based on one study from NHG between 2005 and 2008 (22.6%). In fact it is well known that kidney disease is a disease multiplier as it leads to a higher risk of heart disease.

One of the most important risk factors for any of the complications of diabetes is poor control of blood glucose. Glycated Hemoglobin (HbA1C) is a marker for blood glucose control. By international standards, glucose control is considered 'Optimal' if HbA1C is less than/equal to 7%, 'Acceptable' if between 7.1 and 8% and 'Poor' if >8%. According to the National Health Survey 2010, nearly one third (32%) with known diabetes had poor control of diabetes.

Diabetic Kidney Disease

As suggested earlier, DKD develops in individuals with poorly controlled diabetes. High glucose levels in the blood damages the kidney filters leading to small quantities of albumin (protein) leaking from the blood into the urine. With worsening damage from high glucose levels, more albumin leaks into the urine. The greater the albumin leakage, the more severe the degree of diabetic kidney damage; likewise, the greater the albumin leakage, the less reversible is the DKD. Eventually the damage causes reduced kidney function and ESRD requiring dialysis or kidney transplantation.

Strategies to Reduce the Complications of Diabetes

There are many strategies that can reduce the complications of diabetes. The most important is to prevent diabetes itself and this strategy is known as Primary Prevention. The second strategy is to prevent the complications of diabetes by controlling diabetes and this is known as Secondary Prevention. A third strategy, known as Tertiary Prevention, is to diagnose the complications of diabetes early and to treat the complication so as to prevent its progression to a more severe state. Examples of Tertiary Prevention are screening for DKD with urine tests for Albumin and blood tests for kidney function and eye and foot screening for diabetic eye and foot disease respectively.

Implementation of all three prevention strategies is necessary to prevent the complications of diabetes; furthermore, patient education and empowerment are key to their success. Indeed the biggest challenge in the implementation of these strategies is to persuade diabetics to participate in their own care and be self-disciplined to achieve treatment goals.

Prevention of Progression of DKD

Early detection of DKD once it occurs and its early treatment has been shown to reduce worsening of DKD to more advanced stages and eventually to ESRD. Early and regular testing of urine for albumin (a kind of protein; Albuminuria) and testing of blood for creatinine (a measure of kidney function) can detect DKD in its earliest stages.

For DKD, it is possible to reduce the rate of progression of early DKD to more severe stages of DKD or reduced kidney function by optimally controlling the blood pressure and treating the Albuminuria with medications known as Angiotensin Converting Enzyme inhibitors (ACEi) or Angiotensin Receptor Blockers (ARB). Maximising the doses of ACEi or ARB is known to further reduce Albuminuria.

Diabetic Kidney Disease in Singapore

A survey among hypertensive diabetics in Singapore suggested a nearly 60% prevalence of DKD. In a survey at NHGP of patients on follow-up at NHGP between 2006 and 2009 that examined only diabetic patients with regular testing for DKD at NHGP, we determined that 30.2% had early DKD while 6.7% had more severe form of DKD with more albuminuria and 13.8% had reduced kidney function. Only 49.3% did not have DKD.

Progression of Diabetic Kidney Disease

In the above study conducted at NHGP, we determined that 12.3% of diabetic patients without any DKD develop new onset early DKD every year. Indeed what is worrying is that every year, 7.1% with early DKD progress to more severe Albuminuria. Thus if we start with 100 diabetics, only 50 of whom have no DKD at the start, by the end of 3 years, there would be approximately 16 new patients with early DKD and another 7 patients with pre-existing DKD who progress to a more severe form of DKD.

This progression occurred although diabetes control was 'Optimal' or 'Acceptable' in over 70% of the group and 73% were on treatment with ACEi or ARB, drugs that are known to reduce progression of DKD from early stage to more severe stages. Thus much needs to be done to optimise the care of patients with DKD so as to reduce the rate of ESRD due to diabetes.