

A TIMELY UPDATE IN OUR WAR AGAINST DIABETES

Dr. Low Lian Leng, Dr. Xu Bang Yu

SFP2019; 45(1): 3-4

Type 2 Diabetes Mellitus (T2DM) is a progressive disease characterised by the gradual loss of blood glucose control due to insulin resistance in the body.¹ Individuals with diabetes are susceptible to neuropathy, retinopathy and nephropathy, which could lead to debilitating complications such as amputation, blindness, stroke, coronary heart disease and chronic kidney disease.^{2,3} There are currently 415 million individuals with T2DM worldwide, and the number is projected to increase to 642 million by year 2040.⁴ As T2DM disease progression is lifelong, it imposes a tremendous strain on healthcare systems with its concomitant economic and social costs, especially in countries with high prevalence, such as Singapore (10.5% vs. global average 8.8%).⁵ The prevalence of DM amongst Singaporean adults aged 18 to 69 years mirrors global trends, increasing from 8.2 percent in 2004 to 11.3 percent in 2010.^{6,7} It is estimated that Singapore will have half a million people with diabetes by 2020, and this will rise to 1 million by 2050. Incidentally, Singapore is also the country with the highest incidence of T2DM-related end-stage renal failure⁷ and amputation⁸ worldwide, which prompted the Minister of Health to declare a “war” against T2DM in April 2016.⁹

To reduce the burden on health systems, minimising diabetes-related complications is of paramount importance. Various pharmacological and non-pharmacological interventions have been examined and found to be effective in preventing the onset of T2DM among adults with pre-T2DM.¹⁰ Likewise, interventions to control blood glucose among those with diagnosed T2DM have also been well established.¹¹ Nevertheless, patients are often asymptomatic during the early phase of T2DM. With progression of the disease, patients subsequently may develop symptoms such as increased thirst, frequent urination and even unexplained weight loss. This results in late diagnosis and increases the risk of complications. In Singapore, approximately one in three individuals with T2DM are undiagnosed.^{12,13} For these individuals, the complications may have become severe and irreversible by the time a clinical diagnosis is made.

Family Physicians in various FM settings play an important role in this war against T2DM. Family Physicians in the primary-care setting are at the frontlines to advocate the necessary screening, health education, and treatment for the pre-diabetics, diabetic patients and the family unit. Family Physicians in General Hospitals and Intermediate- and Long-term Care Services also play a role to reinforce the importance of optimal T2DM control, to empower patients for self-care, and to ensure the smooth transition of care for such T2DM patients with complex care needs back to primary care. In this timely update on diabetes mellitus, our established endocrinologist colleagues will speak about oral glucose-lowering agents in T2DM, diabetes as a cardio-metabolic syndrome, and the complication of diabetes. This Family Practice Skills Course is generously sponsored by AstraZeneca Singapore and organised by the College of Family Physicians Singapore.

In Unit 1, Dr. Goh Su-Yen provides a detailed summary of the various available oral glucose-lowering agents for the treatment of T2DM. The article highlights the important pharmaco-dynamics and pharmaco-kinetics of the various oral glucose-lowering agents. The common side effects of these agents are also discussed in this article. Family Physicians will be helped to better understand these agents and to prescribe the appropriate agent for patients with T2DM.

In Unit 2, Dr. Khoo Chin Meng extensively reviews major trials and studies that highlight the association of diabetes mellitus with many disabling comorbidities, leading to premature cardiovascular disease and death. The article highlights several strategies to improve the cardiovascular outcomes among people with diabetes mellitus, including the following: 1) early intensive glycaemic control (UKPDS), especially among those newly diagnosed; 2) optimal treatment of traditional cardiovascular risk factors (STENO-2); and 3) use of novel glucose-lowering therapies (sodium-glucose transporter 2 inhibitors or glucagon-like peptide 1 agonists) that have benefits on cardiovascular events or mortality.

In Unit 3, Adj A/Prof Daniel Chew and Dr. Timothy Quek address the prevention of complications in T2DM. Their article highlights the importance of individualised targets, intensive glucose control and, more importantly, comprehensive care involving treatment of all modifiable cardiovascular risk factors over a sustained period to decrease the risk of morbidity and mortality, especially in newly diagnosed T2DM. The article also shares on the role of specific medications — SGLT2 inhibitors and GLP-1 agonists — in CVD and renal protection in T2DM patients.

The selected ten readings by A/Prof Goh Lee Gan includes articles on important topics that range from how T2DM and the various treatment options have changed over the past decade to future challenges in the management of T2DM. The articles discuss changes in care delivery that increasingly include allied health providers in the self-care management of T2DM and rising healthcare costs contributed by the rising T2DM burden. The roles of newer agents for treatment of T2DM such as SGLT2 Inhibitors and time-tested metformin are also key readings.

For this issue of the SFP, we have one original article by Dr. Farhad Vasanwala and Dr. Ong Chong Yau. This article allows Family Physicians to have an overview of the various cardiovascular anomalies associated with genetic syndromes. It is important for Family Physicians to be aware of common genetic syndromes and their associated cardiac complications so that timely referral to and subsequent co-managing with the cardiologists will minimise further morbidity and mortality.

REFERENCES

References:

1. Fajans SS. What is diabetes? Definition, diagnosis, and course. *Med Clin North Am.* 1971;55:793–805.
2. Murillo AG, Fernandez ML. Potential of dietary non-provitamin A

carotenoids in the prevention and treatment of diabetic microvascular complications. *Adv Nutr*. 2016;7:14–24.

3. Liu JJ, Foo JP, Liu S, Lim SC. The role of fibroblast growth factor 21 in diabetes and its complications: a review from clinical perspective. *Diabetes Res Clin Pract*. 2015;108:382–9.

4. International Diabetes Federation. International Diabetes Federation Diabetes Atlas 7th Edition. 2016 ; Available from: <http://www.diabetesatlas.org/>. [Accessed 25 December 2018]

5. International Diabetes Federation. Singapore vs World Prevalence of Diabetes. 2015 ; Available from: <https://www.idf.org/membership/wp/singapore>. [Accessed 25 December 2018]

6. Poh Z, Venkataraman K, Toh SE, Low LL. Glycaemic, blood pressure and low density lipoprotein cholesterol control in adult patients with diabetes in Singapore: a review of Singapore literature over two decades. *Ann Acad Med Singapore*. 2017;46:374–91.

7. Luo M, Poh Z, Koh G, Tham TY, Lau W, Toh SA, et al. Diabetes management in a Primary Care Network (PCN) of private general practitioners in Singapore: An observational study. *Medicine*. 2018;97:e12929.

8. Woo KT, Choong HL, Wong KS, Tan HB, Chan CM. The contribution of chronic kidney disease to the global burden of major noncommunicable diseases. *Kidney Int*. 2012;81:1044–5.

9. Tan T, Ronald M. Singapore: One of World's Highest for Diabetes-related Leg Amputations 2016.; Available from: https://corp.nhg.com.sg/Media%20Releases/LEA%20Singapore_FINAL_edited.pdf. [Accessed 25 December 2018]

10. Khalik S. Parliament: Health Minister Gan Kim Yong declares 'war on diabetes'; new task force set up. 2016 ; Available from: <http://www.straitstimes.com/singapore/health/moh-declares-war-against-diabetes>. [Accessed 25 December 2018]

11. Stevens JW, Khunti K, Harvey R, Johnson M, Preston L, Woods HB, et al. Preventing the progression to type 2 diabetes mellitus in adults at high risk: a systematic review and network meta-analysis of lifestyle, pharmacological and surgical interventions. *Diabetes Res Clin Pract*. 2015;107:320–31.

12. Goh SY, Ang SB, Bee YM, Chen YT, Gardner DS, Ho ET, et al. Ministry of Health Clinical Practice Guidelines: Diabetes Mellitus. *Singapore Med J*. 2014;55:334–47.

13. National Registry of Diseases Office. Information Paper on Diabetes in Singapore. 2016 ; Available from: <https://www.nrdo.gov.sg/docs/librariesprovider3/default-document-library/diabetes-info-paper-v6.pdf>. [Accessed 25 December 2018]