

Editorial

Enhancing Diabetic Care in the Community in Malaysia: Need for a Paradigm Shift

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Efforts towards improving the management of diabetes mellitus has grown and progressed. Clinical studies and new drug discoveries have led to better treatment for patients. Most healthcare budgets devote an enormous amount of expenditure for the treatment of diabetes. However, despite all these efforts, the disease continues to grow and has been predicted to be unmanageable in the near future. Thus, there is a dire need to relook the current approaches and policies. “Prevention is better than cure” is definitely the precise solution to this catastrophe. A paradigm shift in strategies for the prevention of diabetes and treatment of its risk factors is an imperative.

Cardiovascular disease (CVD) is responsible for 30% of all deaths worldwide.^[1,2] Wild *et al.* (2004) estimated that the total number of people in the world with diabetes is projected to rise from 171 million in the year 2000 to 366 million in 2030.^[3] However, in 2009 the International Diabetes Federation increased the projection of people with diabetes in the world to rise from 285 million in 2010 to 439 million in 2030.^[4] Diabetes mellitus is one of the most common chronic diseases and a major contributor to the development of cardiovascular diseases.^[5] The burden of ill-health due to diabetes is devastating and affects every segment of society. It is associated with reduced life expectancy, significant morbidity due to specific diabetes related micro-vascular complications, increased risk of macro-vascular complications (ischemic heart disease, stroke, and peripheral vascular disease), and a diminished quality of life.^[6] Metabolic syndrome is a cluster of the dangerous risk factors for cardiovascular diseases and type 2 diabetes which include abdominal obesity, high cholesterol, high blood pressure, diabetes (if not yet present) and raised fasting plasma glucose.^[7-11] People with metabolic syndrome have five-fold greater risk of developing type 2 diabetes.^[12]

The burden of mortality, morbidity and disability attributable to non-communicable diseases is currently very high and continuing to grow in the developing countries. Rapid changes in diets and patterns of physical activity are further causing rates to rise. Physical inactivity is an independent risk factor for chronic diseases, and is estimated to cause 1.9 million deaths globally.^[13] Physical activity reduces blood pressure, improves the level of high density lipoprotein cholesterol, reduces risk of type II diabetes, improves control of blood glucose in overweight people, even without significant weight loss, and reduces the

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risk for colon cancer and breast cancer among women.^[14] Smoking also increases the risk for these non-communicable diseases through independent mechanisms.^[14]

DIABETES MELLITUS AND OTHER CARDIOVASCULAR RISK FACTORS - CURRENT SITUATION IN MALAYSIA

The overall national prevalence of diabetes and impaired fasting glucose (fasting blood glucose level of ≥ 6.1 mmol/L) among Malaysians aged 30 years and above had increased from 8.3% in 1996^[15] to 14.9% in 2006.¹⁶ There was an increase in the percentage of known diabetes from 6.5% to 9.5% and a three-fold increase in the newly diagnosed diabetes from 1.8% to 5.4% was also noted in the same period. The odds of having diabetes increase with increasing age, positive family history of diabetes mellitus, increasing BMI, and lower levels of education.^[17] There is no significant difference in the prevalence of diabetes among males and females in Malaysia.^[16,17] The results from the third National Health and Morbidity Survey (NHMS III) carried out in 2006 showed that an estimated 1,492,665 Malaysians aged 18 years and above have diabetes (fasting blood glucose level of ≥ 6.1 mmol/L).^[16] Among those with diabetes mellitus, 60.9% were aware of their diabetic status (previously diagnosed).^[16] Among those who were aware of their diabetic status (previously diagnosed), only 84.3% were under treatment. Out of the 1,492,665 Malaysians aged 18 years and above who had diabetes in 2006, only 766,315 were under treatment. Another national study carried out by Rampal *et al.* in 2004 showed that among those receiving treatment for diabetics, only 25.1% had their fasting blood sugar under control.^[17] Among the diabetics under treatment, 73.5% seek treatment from Government facilities. The private health care facilities are mostly used by the Chinese (32.1%) followed by Indians (19.9%) and Malays (17.2%). The percentage of people with known diabetes using traditional or alternative medicine is below 1% in Malaysia.^[16] The International Diabetes Federation has estimated that adjusted prevalence (adjusted to world population) of diabetes mellitus in Malaysia will rise from 11.6% in 2010 to 13.8% in 2030. The number of people with diabetes is expected to rise from 1,846,000 in 2010 to 3,254,994 in 2030.^[5]

Cardiovascular diseases have been the leading cause of death in Malaysia for the past 40 years.^[18] Prevalence of obesity amongst Malaysians 18 years and above has increased from 4.4% in 1996^[15] to 12.3% in 2004^[19] and 14.2% in 2006.^[16] The overall prevalence of physical inactivity in 2006 was 43.7%. The prevalence of physical inactivity was significantly higher in females (50.5%) compared to 35.3% in males ($p < 0.05$). Similarly, the prevalence of physical inactivity was significantly higher in urban areas (45.6%) compared to 40.1% in rural areas ($p < 0.05$).^[16]

The prevalence of hypertension amongst adults aged 30 years and above in Malaysia has increased from 32.9% in 1996^[20] to 40.5% in 2004^[18] and to 42.6% in 2006.^[16] Malaysia still has a serious problem with low awareness, low treatment rates and poor control of hypertension. The NHMS III^[16] reported that only 35.8% of respondents with hypertension were aware that they had hypertension and only 31.4% were currently being treated, and only 8.2% had their blood pressure under control. It was estimated that in 2006, there were 4.8 million Malaysian residents who had hypertension.^[16] The overall prevalence of metabolic

syndrome amongst those aged 30 years and above in Malaysia in 2004 was 29.8 % (95% CI 28.2, 31.5).^[21] Thus reducing the risk factors, morbidity and mortality related to diabetes should be a major public health objective.

CURRENT APPROACH IN MANAGEMENT OF DIABETES IN THE COMMUNITY

Management of diabetic care in the community appears to be provider-directed and focused on pharmacologic and surgical interventions, which is tertiary prevention with little attention to primary and secondary prevention. There is lack of awareness in the community. Emphasis is on patient self-management behaviours and provider-patient interactions are still poor. Diabetic care involves individual providers reacting to patient-initiated complaints and visits and there is inadequate patient education and social support. The goals are generally short term. The cost is high in terms of economics and disability due to the growing disease burden and its complications. Results of the treatment and prognosis of patients are unsatisfactory due to late presentation and delayed treatment. Screening for micro-albuminuria is not done routinely by many healthcare providers. Blood pressure and glycaemic control which are crucial in the management of diabetic nephropathy are generally suboptimum. The NHMS III reported that only 1.6% of diabetic patients were on dialysis or had kidney transplant, 4.3% had limb amputation and another 3.4% of the diabetics had stroke.^[16]

Detailed neurology testing is not done in the majority of the cases in practice due to time constraints. From the data of these complications, it is clear that drastic measures must be taken to reduce the prevalence by tackling all modifiable risk factors of diabetes like obesity, diet, inactivity and other cardiovascular risk factors. Treating complications of diabetes without serious attempts at preventing diabetes will not yield satisfactory outcomes and will cripple the healthcare system of the country.

ENHANCING DIABETIC CARE IN THE COMMUNITY - THE PARADIGM SHIFT

There is a need for a holistic understanding of the disease and management of its problems to enable us to create the change. In order to enhance management of diabetes in the community, we need to address the problem of lack of awareness, lack of self-care, underlying social determinants, increased prevalence of the risk factors, lack of community involvement and the issue of equity and accessibility at affordable cost. We need to set clear objectives that are specific, measurable, achievable, relevant and timely. There is a need to have a holistic approach and community participation. Involvement of the people at all levels especially those in policy-making and implementation is important. The communities need to be empowered and we must enable people to have greater control over efforts to improve their health. The diabetic care programme has to be proactive, integrated, and population-centred. Decision makers should choose appropriate technologies to apply ethically and cost-effectively, while enhancing care and services provided. The health professional's role should be reassigned as facilitators and educators rather than mere providers. Capacity

building of diabetes educators needs to be enhanced. In empowering the community, health care professionals should equip the people with the knowledge and skills to take action on the determinants of their health. It has to be a process that should promote participation of people in gaining control over their lives.

Primary prevention is clearly the best way to avoid morbidity and mortality from diabetes. It is aimed at intervening before pathological changes have begun, during the natural history stage of susceptibility. The prevalence of obesity, physical inactivity and lack of self-care is high in the community. The community needs to act more aggressively to reduce these risk factors. The best strategies for prevention of type 2 diabetes are diet, weight control and adequate physical activity among people at high risk or with impaired glucose tolerance.^[22-23] A weight loss of 5-10 % of initial body weight over a six-month period in patients with diabetes improves insulin sensitivity and dyslipidaemia and also reduces blood pressure.^[24,25] This can be achieved by a reduced calorie diet, increased physical activity and behavioural modification. Reduction of calorie and fat intake are associated with weight control and improved glycemic control.^[26-27] An increase in physical activity can assist in weight maintenance and reduce the risk of cardiovascular diseases.^[28] We need to raise awareness and knowledge of the health benefits of physical activity in the population and increase physical activity in adults. Transport, infrastructure and land-use policies that create appropriate conditions for safe walking and cycling need to be planned and implemented. There must be commitments from local authorities (City Hall, Town Councils, District Councils) and the government to increase the amount of parks and recreational facilities for physical activity. This can be further accentuated by local authorities that pass urban design plans that facilitate physical activity. Along with physical activity, education on a healthy diet should be recommended. These indicators should be part of Key Performance Index (KPI) of the local authorities. The community needs to be educated on achieving energy balance and a healthy weight; limiting energy intake from total fats and shifting fat consumption away from saturated fats to unsaturated fats and towards the elimination of trans-fatty acids. They must be educated and encouraged to consume a high fibre diet (20-30 grams of fibre per day) consisting of fruits, vegetables, legumes, whole grains and nuts^[29] and to limit the intake of free sugars and salt (sodium) consumption from all sources.

Capacity building and leadership need to be built in individuals within leading agencies who can be high ranking officers in local authorities as well as from local programme coordinators in the intervention settings, including community, workplace and schools. Allocation of financial resources to implement physical activity policies and plans is the basis for any actions towards the promotion of physical activity and indicates the degree of national and organisational commitment. It is important to ensure that a multi-sectoral coordinating mechanism, which draws upon existing structures, is present to promote healthy eating and physical activity in schools. There must be a monitoring and evaluation mechanism that measures the effectiveness of policies that promote healthy eating and physical activity put in place within schools. This monitoring and evaluation process should take place at regular intervals and make use of appropriate indicators.^[30,31] Community approaches should be developed to optimise primary and secondary care and quality of

life. Settings for community approach activities can be community-wide intervention, worksites or schools.

Increased emphasis should also be on community awareness and screening for early detection. The community needs to be more aggressive to reduce the risk factors. For secondary prevention of diabetes, there is need for early detection and early commencement of treatment. There is a need to relook the healthcare delivery system as a whole. The existing resources, structure and efficiency need to be re-examined. There is also a need to determine the knowledge, attitude and practices of the health care providers with regard to screening and management of patients. The barriers at different levels need to be addressed. We need to determine the level of knowledge, behaviour and social determinants of the patients and community.

Secondary prevention of diabetes seeks to detect pre-diabetes and diabetes early, treat promptly and to slow its progression at its earliest stage, prevent complications, and limit disability. It is vital to identify individuals in the community with diabetes or at risk of diabetes by screening. Secondary prevention should therefore focus primarily on the stage of pre-symptomatic disease or on the very early stage of clinical disease so as to prevent the disease from progressing further. Diabetes education can be an important strategy to enhance and improve diabetes awareness in the community. This will help to identify individuals in the community with diabetes or at risk of diabetes. It is also one of the effective strategies for improving clinical outcomes in patients with type 2 diabetes.^[32,33] Diabetes education can be utilised to optimise metabolic control and prevent acute and chronic complications.

Another important strategy is proper case management which should involve lifestyle modification, patient education to encourage and empower self-care and medication.^[34-36] In monitoring glycaemic control, self-blood glucose monitoring is the method of choice especially for patients on insulin. People with diabetes should be screened for complications at diagnosis and thereafter at yearly intervals.^[37] Pregnant women with type 2 diabetes should have retinal examination during each trimester.^[38] Proper case management, self care and empowerment is a crucial element of good diabetes care in the community. Several studies have shown that comprehensive interventions that include self-management can prevent complications from diabetes.^[39-41] In striving for tight glycaemic control, self-monitoring of blood glucose is recommended. Tight glycaemic control improves micro-vascular outcomes among persons with type 1 and type 2 diabetes.^[42,43] and macro-vascular complications in type 2 diabetics. Monitoring of the total daily carbohydrate (by carbohydrate exchange) is an important strategy in achieving glycaemic control.^[44] HbAc reflects overall glucose control over a 3-month period and reduction of HbAc has been shown to reduce the risk of micro-vascular^[45] and macro-vascular complications. HbAc should be measured every three to six months to ensure that the glycaemic targets are being met.

Hypertension should be detected and treated early in patients detected with diabetes. Hypertension control will assist in preventing cardiovascular disease and also delay the progression of diabetic retinopathy. Every 10mm Hg reduction in systolic blood pressure has been shown to account for a 15% reduction in diabetes related deaths.^[46] In the presence of neuropathy or when the blood pressure is not controlled, sodium restriction with or

without a diuretic may be necessary.^[47] Moderate sodium intakes are advisable. We should put in place information systems to track and monitor interventions and patient, practice or population-based outcomes. Prevention or delay of diabetes with lifestyle intervention or metformin can persist for at least 10 years.^[48] Primary prevention of diabetes and its associated factors in the community is urgently required in Malaysia. It should be holistic in approach involving awareness campaigns, lifestyle modification (diet, weight control and adequate physical activity) intervention and diabetes education in the community. Patients with pre-diabetes and diabetes should be empowered and self-care and self-monitoring further emphasised. Capacity building and leadership of health care workers, community leaders and non-government organisations need to be enhanced.

The Malaysian Health Promotion Board is a statutory body established under an Act of Parliament of Malaysia Act 2006. The objectives are (i) to develop the capacity of organisations, including health-related and community-based organisations for health promotion, and(ii) to plan, develop and support multi-strategy programmes that promote and support healthy lifestyles and healthy environments through various settings and sectors. In addition to tobacco control and cardiovascular disease prevention as the priority areas, diabetes prevention is another important area.^[49] The non-government organisations can apply for grants for these activities. There is sufficient evidence for policy change and we need to translate the existing knowledge to ACTION.

REFERENCES

- [1] Murray CJ, Lopez AD. Mortality by cause for eight regions of the world: global burden of disease study. *The Lancet* 1997; 349(9061): 1269–76.
- [2] World Health Organization. *World Health Report. Mental Health: New Understanding, New Hope*. Geneva: WHO, 2001; 144–9.
- [3] Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. *Diabetes Care* 2004; 27: 1047–1053.
- [4] International Diabetes Federation (IDF) Prevalence estimates of diabetes mellitus (DM) 2010 and 2030 In: *IDF Diabetes Atlas (4th ed)*, 2009.
- [5] Jarrett RJ, McCartney P, Keen H. The Bedford Survey: ten-year mortality rates in newly diagnosed diabetics, borderline diabetics and normoglycaemic controls and risk indices for coronary heart disease in borderline diabetics. *Diabetologia* 1982; 22: 79–84.
- [6] World Health Organization. *Definition and Diagnosis of Diabetes Mellitus and Intermediate Hyperglycemia: Report of a WHO/IDF Consultation*. Geneva, Switzerland: World Health Organization, 2006.
- [7] Gallassi A, Reynolds K, He J. Metabolic syndrome and risk of cardiovascular disease: a meta analysis. *Am J Med* 2006; 119: 812–819.
- [8] Alberti KG, Zimmet P, Shaw J. Metabolic syndrome-a new world-wide definition. A Consensus Statement from the International Diabetes Federation. *Diabet Med* 2006; 23(5): 469–80.

- [9] Alberti KG, Zimmet P, Shaw J. IDF Epidemiology Task Force Consensus Group. The metabolic syndrome, a new worldwide definition. *The Lancet* 2005; 366: 1059–62.
- [10] Malik S, Wong ND, Franklin SS, Kamath TV, L'Italien GJ, Pio JR, Williams R. Impact of the metabolic syndrome on mortality from coronary heart disease, cardiovascular disease, and all-causes in United States adults. *Circulation* 2004; 110: 1245–1250.
- [11] Hunt KJ, Resendez RG, Williams K, Haffner SM, Stern MP: National Cholesterol Education Program versus World Health Organization metabolic syndrome in relation to all-cause and cardiovascular mortality in the San Antonio Heart Study. *Circulation* 2004; 110:1251–1257.
- [12] Stern M, Williams K, Gonzalez-Villalpando C *et al.* Does the metabolic syndrome improve identification of individuals at risk of type 2 diabetes and/or cardiovascular disease? *Diabetes Care* 2004; 27(11):2676–2681.
- [13] WHO Physical Activity and Inactivity WHO Int [Accessed 17 Nov. 2009].
- [14] WHO Global Strategy on Diet, Physical Activity and Health 2004.
- [15] Ministry of Health. Second National Health and Morbidity Survey 1996. NHMS Report 1997.
- [16] Ministry of Health. Third National Health and Morbidity Survey 2006. Survey Report 2008.
- [17] Rampal S, Rampal L, Rahmat R, Azhar MZ, Yee GY, Mohamed M. Variation in the prevalence, awareness, and control of diabetes in a multiethnic population: a nationwide population study in Malaysia. *Asia-Pacific J Publ Hlth* 2009; 22(2).
- [18] Rampal L, Rampal S, Azhar MZ, Rahman AR. Prevalence, awareness, treatment and control of hypertension in Malaysia: a national study of 16,440 subjects. *Publ Hlth* 2008; 122: 11–18.
- [19] Rampal L, Rampal S, Khor GL, Azhar MZ, Ooyub S, Rahmat R, Noor Ghani S, Krishnan J A national study on the prevalence of obesity among 16,127 Malaysians. *Asia-Pacific J Clin Nutr* 2007; 16 (3):561–566.
- [20] Lim TO, Morad. Prevalence, awareness, treatment and control of hypertension in the Malaysian adult population: The National Health and Morbidity Survey 1996. *Med J Singapore* 2004; 45:20–27.
- [21] Rampal L, Rampal S, Azhar MZ, Taha M, Sherina MS. Prevalence and factors associated with metabolic syndrome in Malaysia. In: *Proceedings of international scientific meeting on metabolic disorders – an integrative approach to healthy living*, Kuala Lumpur 2008: 17.
- [22] Pan XR, Li GW, Hu YH *et al.* Effects of diet and exercise in preventing NIDDM in people with impaired glucose tolerance. The Da Qing IGT and Diabetes Study. *Diabetes Care* 1997; 20:537–44.

- [23] Goldstein DJ. Beneficial health effects of modest weight loss. *Int. J. Obes. Relat Metab Disord* 1992; 16:397–415.
- [24] Tuomilehto J, Lindstrom J, Eriksson JG *et al.* Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *N Engl J Med* 2001; 344:1343–1350.
- [25] Knowler WC, Barrett-Connor E, Fowler SE *et al.* For the Diabetes Prevention Group Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *New Engl J Med* 2002; 346: 393–403.
- [26] Wing RR, Koeske R, Epstein LH, Nowalk MP, Gooding W, Becker D. Long-term effects of modest weight loss in type II diabetic patients. *Arch Intern Med* 1987; 147: 1749–53.
- [27] Watts NB, Spanheimer RG, DiGirolamo M *et al.* Prediction of glucose response to weight loss in patients with non insulin-dependent diabetes mellitus. *Arch Intern Med* 1990; 150: 803–6.
- [28] Boule N, Kenny G, Haddad *et al.* Effects of exercise on glycaemic control and body mass in type 2 diabetes mellitus: a meta analysis of controlled clinical trials. *JAMA* 2001; 286: 1218 – 1227.
- [29] Schulze MB, Liu S, Rimm EB *et al.* Glycaemic index, glycaemic load and dietary fiber intake and incidence of type 2 diabetes in younger and middle aged women. *Am J Clin Nutr* 2004; 80:348–356.
- [30] WHO Implementation of WHO Global Strategy on Diet, Physical Activity and Health- A Guide for Population Based Approaches to Increasing Physical Activity. 2007.
- [31] WHO School Policy Framework - Implementation of WHO Global Strategy on Diet, Physical Activity and Health 2008.
- [32] Norris SL, Lau J, Smith SY *et al.* Self-management education for adults with type 2 diabetes : a meta-analysis of the effect on glycemic control. *Diabetes Care* 2002; 25:1159–1171.
- [33] Ellis SE, Speroff T, Dittus RS *et al.* Diabetes patient education: a meta analysis and meta regression. *Patient Educ Couns* 2004; 52: 97–05.
- [34] Funnell MM, Anderson RM, Austin A *et al.* American Association Diabetes Educator Position Statement: Individualization of Diabetes Self-management Education. *Diabetes Educ* 2007; 33: 45-49
- [35] Funnell MM, Brown TL, Childs BP *et al.* National standards for diabetes self management education. *Diabetes Care* 2008; 31: S97 –S104.
- [36] Martin C, Daly A, McWhorter LS *et al.* American Association Diabetes Educator Position Statement: The Scope of Practice, Standards of Practice, and Standards of Professional Performance for Diabetes Educators. *Diabetes Educ* 2005; 487–512.

- [37] American Diabetic Association (ADA). Position Statement on Standards of Medical Care in Diabetes 2009. *Diabetes Care* 2009; 32: S13–S61.
- [38] Diabetes retinopathy. *Diabetes Care* 2000; 23: S 73–S76.
- [39] The DCCT/EDIC Research Group: Retinopathy and nephropathy in patients with type 1 diabetes four years after a trial of intensive therapy. *N Engl J Med* 2000; 342: 381–389.
- [40] The DCCT Research Group: The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med* 1993; 329: 977–986.
- [41] The UK Prospective Diabetes Study Group: Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). *The Lancet* 1998; 352: 837–853.
- [42] Ohkubo Y, Kishikawa H, Araki E *et al.* Intensive insulin therapy prevents the progression of diabetic microvascular complications in Japanese patients with non-insulin-dependent diabetes mellitus: a randomized prospective 6-year study. *Diabetes Res Clin Pract* 1995; 28: 103–17.
- [43] Wake N, Hisashige A, Katayama T *et al.* Cost-effectiveness of intensive insulin therapy for type 2 diabetes: a 10-year follow-up of the Kumamoto study. *Diabetes Res Clin Pract* 2000; 48: 201–10.
- [44] The Diabetes Control and Complication Trials Research Group. The effect of intensive treatment of diabetes on the development and progression of long term complications in insulin dependent diabetes mellitus. *New Engl J Med* 1993; 329: 997 – 986.
- [45] Adler AL, Stratton IM, Neil HA *et al.* Association of systolic blood pressure and macrovascular and microvascular complications of type 2 diabetes (UKPDS 36): Prospective Observational Study. *BMJ* 2000; 321: 412–419.
- [46] Stratton IM, Adler AL, Neil HA *et al.* Association of glycaemia with macrovascular and microvascular complications of Type 2 diabetes (UKPDS 35): Prospective Observational Study. *BMJ* 2000; 20: 411–417.
- [47] ADVANCE Collaborative Group. Effects of a fixed combination of perindopril and indapamide on macrovascular and microvascular outcomes in patients with type 2 diabetes (ADVANCE Trial): a randomized controlled trial. *The Lancet* 2007; 370: 829–840.
- [48] Diabetes Prevention Program Research Group George Washington University USA. Prevention or delay of diabetes with lifestyle intervention or metformin can persist for at least 10 years. *The Lancet* 2009; 374 (9702): 1677–1686.
- [49] Rampal L. Malaysian Health Promotion Board – Functions and Priorities. *Malaysian J Med Sci* 2008; 15 (1): 10.