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Optimal Prevention and Management of Diabetes in Family Medicine

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Abstract: **Diabetes mellitus (DM) and its associated disease outcomes are a growing concern worldwide. Effective diabetes management in Family practice can reduce the occurrence and progression of many further complications. A comprehensive search was carried out using electronic databases (Medline, Embase and HealthStar) search was performed by Authors using the following Mesh headings: Family Practice or General Practice, and Primary care, diabetes Mellitus, Glucose intolerance, prevention, Quality Control or Continuous Quality Improvement of diabetes prevention. The search was limited to English language journals and to the period from January 1980 to September 2016. Developing performance indicators for primary health care organisations more specifically focusing on the assessment and management of behavioural risk factors in patients at risk of developing DM could help pervention in primary care.**

Keywords: **Diabetes mellitus (DM), Electronic Databases (Medline, Embase and HealthStar).**

1. INTRODUCTION

Diabetes mellitus (DM) and its associated disease outcomes are a growing concern worldwide. The current global prevalence of DM for all ages has been estimated at 2.8% and is predicted to reach 4.4% by 2030[1]. In the United States (U.S.), the prevalence of diagnosed DM was estimated at 5.1% in 1997 for adults between the ages of 40 and 74 years [2]. In 2002,

Impaired glucose tolerance, typically characterised by hyperglycaemia and insulin resistance, is considered to be a stage in the development of type 2 diabetes. Up to half of all people with impaired glucose tolerance will progress to type 2 diabetes within 10 years of diagnosis[3]. In addition, people with impaired glucose tolerance are known to be at significantly increased risk of cardiovascular disease, which may present before the onset of diabetes[4]. Studies in the United Kingdom have reported the prevalence of impaired glucose tolerance in the 35-65 year age group to be around 17%[5].

Effective diabetes management in Family practice can reduce the occurrence and progression of many further complications [6,7,8,9,10,11]. however; many countries have developed clinical practice guidelines (CPGs) for primary care physicians to promote comprehensive care and management of patients with type 2 DM. Earlier in Canada, for example two sets of CPGs for diabetes care have been published. The Canadian Diabetes Advisory Board in association with the Canadian Diabetes Association published the first set in 1992[12]. these were revised in 1998 and converted into evidence-based, graded CPGs, which supported more aggressive screening and treatment for diabetes and related complications[13].

Primary medical care can prevent many common diabetes complications, including ischemic heart disease, stroke, retinopathy, nephropathy, and neuropathy[14]. The American Diabetes Association (ADA) recommends that persons with diabetes receive at least semiannual hemoglobin A_{1C} (HbA_{1C}) monitoring, annual retinal examination to monitor or screen for retinopathy, and annual microalbuminuria testing to screen for nephropathy[15].The delivery of ADA-recommended services has been estimated to require 2 to 4 annual medical visits for most patients with diabetes[15].

Despite the effectiveness of preventive care for diabetes, many patients do not receive recommended services[16]. One contributing factor may be that some patients simply do not make regular clinic visits for diabetes care, and patients who

receive infrequent outpatient monitoring may be less likely to receive recommended preventive services[17,18]. Moreover, acute illnesses account for the majority of primary care visits, and clinicians are much less likely to perform tasks that may facilitate prevention during acute illness visits[19]. Thus, longitudinally, both the quantity and content of outpatient care may affect the delivery of timely preventive services for diabetes.

In previous trails [20] involving general practitioners (GPs) has shown that, although they are aware of impaired glucose tolerance, they do not understand its significance in relation to the risk of subsequent diabetes, and that they considerably underestimate its prevalence in their practice. They also want guidance as to improve their work, if anything; they should do about DM diagnosis and management. Views of GPs and practice have also been described for screening for type 2 diabetes,[21] but their views about the identification of individuals 'at risk' and interventions based in primary care have not yet been reported.

Objectives:

The goal of this systematic review is to evaluate the state of the evidence in the areas of the diagnosis, and prevention of Diabetes in Family practice.

2. METHODOLOGY

Study Design:

Systematic review study was conducted.

Search strategy:

A comprehensive search was carried out using electronic databases (Medline, Embase and HealthStar) search was performed by Authors using the following Mesh headings: Family Practice or General Practice, and Primary care, diabetes Mellitus, Glucose intolerance, prevention, Quality Control or Continuous Quality Improvement of diabetes prevention. The search was limited to English language journals and to the period from January 1980 to September 2016. The titles and abstracts of all papers identified by the electronic search were inspected. Papers were discarded which clearly failed to satisfy the inclusion criteria for the study—for example studies conducted prevention of other chronic illness. We then searched the reference lists of the retrieved articles and hand searched the main journals with family practice content worldwide.

Studies were included if they attempted to measure the quality of technical processes of care provided in general practice excluded studies of interpersonal care or those that only assessed structural aspects of care. We also excluded studies without a clear denominator such as critical incident analyses and case reports. In most cases we only included studies that assessed the care provided against standards described explicitly by the authors of the papers.

3. RESULTS

As Glanz et al,[22] has stated in his study that primary care medicine needs the support of public health or community interventions for primary prevention. Also needs the support of the medical care system by assessing risk status, discussing risk and referring to a proven community-based prevention program is a critical role for the primary care practitioner. For many people, specific encouragement by their health care practitioner is a key factor in taking action to improve their health and this is a very effective way in preventing Diabetes Mellitus in family practice[22].

Thepwongsa et al [28] stated that general practitioners (GPs) have a major role to play in diabetes care[28]. Colagiuri et al. [29] defined primary prevention of T2DM, as prevention of diabetes onset, has been demonstrated under trial conditions through lifestyle modifications, pharmacotherapy, and surgical approaches to reduce obesity [29]. the same study Colagiuri et al [29] involved Australian guidelines state that progression to T2DM can be prevented; Evidence level I. According to Knowler et al [30,31] three landmark trials have contributed to this evidence: the Finnish Diabetes Prevention Study (DPS), the US-based Diabetes Prevention Programme (DPP), and the Da-Qing Study in China. two recent studies Chasan-Taber, Oostdam et al., [32,33] have found that Lifestyle and dietary strategies have also been employed among women with gestational diabetes mellitus (GDM) or at risk for developing GDM and, although there is a need for better-designed studies, there appears to be some evidence of benefit [32,33].

Shephard et al [34]demonstred the effective of GP-based diabetes management programmes in rural regions is the Diabetes Management Along the Mallee Track, which incorporated community risk assessment and point-ofcare testing (PoCT) to

manage patients with diagnosed diabetes (T1DM and T2DM) in partnership with local GPs. (Shephard et al., 2005). This service was offered irrespective of diabetes type and after 10 months the percentage of people achieving good glycaemic control (HbA1c) increased from 59 %to 91%. PoCT diabetes management programmes have been implemented in a number of rural and urban settings including Aboriginal communities, and an accreditation programme has been established for ongoing implementation (Shephard, 2006). Patient and GP satisfaction with PoCT programmes is high, and significant improvement in diabetes management is consistently observed.

However, a systematic review Gialamas et al [35] found that a lack of good quality, long-term follow-up studies prevented overall conclusions being drawn on the effectiveness of PoCT in the general practice setting.

A systematic review and meta-analysis Merlotti et al [36] included 71 studies aimed at prevention of T2DM found that overall study quality was poor, but the evidence indicated significant efficacy for antidiabetic drugs, physical activity with diet, diet alone, physical activity or education, antihypertensive drugs, and lipid-lowering drugs, but higher effectiveness of bariatric surgery among the morbidly obese [36]. These outcomes suggest that there may be several strategies for prevention of T2DM.and therefore Prevention of DM 2 can be achieved with lifestyle changes and the use of some medications and regular screening by family physician.

Early Diagnosis of diabetes in Primary care:

For decades, the diagnosis of diabetes was based on plasma glucose criteria, either the fasting plasma glucose (FPG) or the 2-h value in the 75-g oral glucose tolerance test (OGTT) [23].

view studies and guidelines which were included in our review showed very efficient approach for early prediction of DM. In 2009 an International Expert Committee that included representatives of the American Diabetes Association (ADA), the International Diabetes Federation (IDF), and the European Association for the Study of Diabetes (EASD) recommended the use of the A1C test to diagnose diabetes, with a threshold of ≥6.5% [24], and ADA adopted this criterion in 2010 [23].

The diagnostic test should be performed using a method that is certified by the National Glycohemoglobin Standardization Program (NGSP) and standardized or traceable to the Diabetes Control and Complications Trial (DCCT) reference assay. Point-of-care A1C assays, for which proficiency testing is not mandated, are not sufficiently accurate at this time to use for diagnostic purposes.

Other identified [25,26] studies show a similar relationship between A1C and risk of retinopathy as has been shown for the corresponding FPG and 2-h PG thresholds. The A1C has several advantages to the FPG and OGTT, including greater convenience (since fasting is not required), evidence to suggest greater preanalytical stability, and less day-to-day perturbations during periods of stress and illness. These advantages must be balanced by greater cost, the limited availability of A1C testing in certain regions of the developing world, and the incomplete correlation between A1C and average glucose in certain individuals. In addition, HbA1c levels may vary with patients' race/ethnicity [25,26].

We also identified an important prospective study [27] that was performed in the Team 1 Family Medicine Health Center Kalesija. During the study period of 6 months, one group was extensively educated on changing lifestyle (healthy nutrition and increased physical activity), the second group was treated with 500 mg metformin twice a day, while the control group was advised about diet and physical activities but different from the first two groups, at beginning of the study, all patients were measured initial levels of blood glucose, HbA1C, BMI, body weight and height and waist size. Also the same measurements were taken at the end of the conducted research, 6 months later. For the assessment of diabetes control was conducted fasting plasma glucose (FPG) test and 2 hours after a glucose load, and HbA1C. The study showed Lifestyle modification (diet and increased physical activity) improves glycemic regulation and reduces obesity, can prevent or delay the onset of developing type 2 diabetes. Pharmacological treatment with metformin also reduces the risk, although less dramatically. It is assumed, that the good and ongoing diabetes prevention through education about the benefits of lifestyle change and metformin treatment could lead to a reduction in atherosclerosis and other cardiovascular diseases, which are the main cause of death in people with type 2 diabetes[27].

Physical activity and diet in prevention T2DM in primary care:

Several studies [37,38,39,40,41] were identified discussing Physical activity, diet and obesity Brief interventions to promote physical activity or healthy eating in low risk patients in primary care have not been demonstrated to be universally effective. However evidence is stronger for patients at high risk of cardiovascular or other chronic diseases especially

where moderate to high intensity interventions were used. Such interventions include those which aim to achieve at least 30 minutes of moderate physical activity each day, less than 10% of diet energy as saturated fat and 30% as total fat, increased fruit and vegetable intake and reduced calories and 5% reduction in body weight if overweight or obese. The more effective programs enlist family involvement, use group counseling and provide tailored advice and follow up [37,38,39,40,41].

4. CONCLUSION

These options for the further development of the role of primary health care in behavioural risk factor management need to be considered within the context of broader primary health care reform and changing population health priorities for prevention of DM. The measurable benefits are likely to include improvements to access to and the quality of preventive interventions. Mechanisms need to be established to enable these to be monitored more effectively than at present. Developing performance indicators for primary health care organisations more specifically focusing on the assessment and management of behavioural risk factors in patients at risk of developing DM could help pervention in primary care.

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