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The role of the clinical pharmacist in the management of type 2 diabetes: current insights and future direction

T. Arokiasamy
PhD Scholar, Shri Jagdishprasad JhabarmalTibrewala University Vidyanagari, Jhunjhunu, Rajasthan, India-333001
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Abstract
The role of pharmacists in diabetes management, including patient identification, assessment, education, referral, and monitoring, is described. Pharmacists can help identify patients with diabetes through screening and should target patients at high risk, people with a family history of the disease, and women with a history of gestational diabetes or who delivered a baby weighing more than nine pounds. Patient education should be provided immediately after diagnosis, at a second stage at which time a patient assessment can be performed, and at a third stage during which patients can receive continuing education to reinforce concepts and a motivational boost. One of the pharmacist's most important roles is the referral of patients to other members of the diabetes care team. Although the role of the pharmacist in monitoring diabetes is not well defined, it might include such things as ascertaining whether physician visits and testing to assess long-term glycemic control. Obtaining certification as a diabetes educator is recommended. This process requires at least 1000 hours of experience in providing disease-state management for patients with diabetes and successful completion of an examination. Implementing diabetes management services requires a commitment of time, effort, and resources and may necessitate training of staff and changes in work patterns. The pharmacist can play an important role in diabetes care by screening patients at high risk for diabetes, assessing patient health status and adherence to standards of care, educating patients to empower them to care for themselves, referring patients to other health care professionals as appropriate, and monitoring outcomes. Providing diabetes management services requires market savvy, communication skills, and a commitment of time, effort, and resourcesPharmacists who obtain training in diabetes management reap rewards in professional satisfaction and financial reimbursement. Type 2 diabetes is a chronic disease occurring in ever increasing numbers worldwide. It contributes significantly to the cost of health globally; however, its management remains in the most part less than optimal. Patients must be empowered to self-manage their disease, and they do this in partnership with health care professionals. Whilst the traditional role of the pharmacist has been centered around the supply of medicines and patient counseling, there is an evergrowing body of evidence that pharmacists, through a range of extended services, may contribute positively to the clinical and humanistic outcomes of those with diabetes. Further, these services can be delivered cost-effectively. This paper provides a review of the current evidence supporting the role of pharmacists in diabetes care, whilst providing a commentary of the future roles of pharmacists in this area.
Key words: pharmacy, interventions, outcomes, benefits, glycemic control, cost – effectiveness.

I. INTRODUCTION

Diabetes mellitus ("diabetes") is one of the fastest growing chronic diseases worldwide, and is associated with significant morbidity, mortality, and health care costs. Diabetes is characterized by high levels of glucose in the blood (hyperglycemia). There are three main types of diabetes: Type 1 diabetes mellitus (T1DM) in which there is an absolute deficiency in insulin production. This disease can occur at any age, although it mostly occurs in children and young adults. Type 2 diabetes mellitus (T2DM) which is associated with insulin resistance, with an initial increase in insulin secretion, however over time, beta cell death and insulin insufficiency. Although T2DM mainly occurs in people aged over 40 years old, the disease is also becoming increasingly prevalent in the younger age group. Gestational diabetes which occurs during pregnancy. The condition usually disappears once the baby is born; however, a history of gestational diabetes increases a woman's risk of developing T2DM later in life. The statistics related to diabetes mellitus globally are alarming. The International Diabetes Federation (IDF) Diabetes Atlas, Seventh Edition, 2015, provides the following estimates: one in 11 adults have diabetes (416 million), nearly half (46.5%) of adults with diabetes are undiagnosed, one in seven births are affected by gestational diabetes, 542,000 children have type 1 diabetes, and a person dies from diabetes every 6 seconds. Further, the IDF estimates that by 2040, one in 10 adults (642

million) will have diabetes. Of those people with diabetes, three quarters (75%) live in low- and middle-income countries. The Western Pacific region (which includes Australia) has 37% of all adults living with diabetes. This includes 100 million people in the People's Republic of China (ranked highest in number of people with diabetes), 10 million people in Indonesia (seventh highest), and 7.2 million in Japan (ninth highest). Also included in this region is the country with the highest prevalence of diabetes the Pacific Island nation of Tokelau where 30% of the adult population has diabetes. Globally, Cambodia has the lowest prevalence of diabetes at 3%.

T2DM is the greatest contributor to the burden of diabetes globally accounting for up to 90% of people with diabetes worldwide.[4] Further, its prevalence is increasing in all countries around the world. This increase has paralleled the global epidemic of obesity. It is estimated that since 1980 worldwide, obesity has nearly doubled. In 2008, it was estimated that there were 1.4 billion adults (35% of those 20 years or older) who were overweight, of which over half a billion (11%) were obese. Importantly, it is reported that being overweight or obese contributes significantly to the burden of diabetes (44%), ischemic heart disease (23%), and certain cancers (range 7%–41%). Yet, obesity is preventable, and strategies to prevent diabetes and cardiovascular disease both include the common goal to optimize peoples' weight through diet and exercise. Adults with diabetes have a two- to threefold increased risk of suffering a heart attack or stroke compared to those without diabetes.[6] The microvascular complications of diabetes mellitus make it the leading cause of preventable blindness, renal disease, and amputation in developed countries. These complications have dramatic implications for health care costs, with the total annual cost impact of diabetes in Australia estimated to be at $14.6 billion, whilst globally, it is estimated to account for 12% of the global health expenditure (US$673 billion). By 2040, it is estimated that the proportion of global health expenditure will exceed US$802 billion. Optimizing therapy in patients with diabetes is a difficult clinical task requiring considerable patient education and motivation. The goal is to improve glycemic control without adverse bodyweight gain or hypoglycemia, and with a positive or neutral effect on lipid levels and blood pressure. Proper drug selection involves identifying the drug that is most likely to improve control and least likely to cause interactions, and adverse effect or adherence problems. Consequently, it has the potential to change patients' futures and health care systems' costs.

Pharmacists represent the third largest health profession in the world[1] after doctors and nurses. Most pharmacists work in the community with a smaller proportion in hospital pharmacy, academia, industry, and research. Community pharmacies provide a range of products (in respect to diabetes prescription and nonprescription medication, blood glucose meters and testing strips, needles and swabs, dietary supplements) and services (such as medication review, vaccination, unit dose dispensing, needle exchange, point of care testing, disposal of unwanted medicines, etc). Community pharmacists are considered to be the most accessible health care professionals, as no appointments are required to see them, and to have the highest level of patient contact. As such, they are well placed to play a significant role in the care of patients with T2DMThis review discusses the health care requirements of T2DM and the current and future roles of pharmacists in its management. For the purposes of the review, papers were identified from English language PubMed and ScienceDirect databases up until October 2016, and by manually reviewing the references for the papers adjudged relevant based on title and abstract, and then full paper review. The keywords used included diabetes, pharmacist, pharmacy, intervention, glycosylated hemaglobin (HbA1c), improvement, benefit, and outcomes. Papers critiqued in this review include original research papers, together with systematic reviews and meta-analyses. The paper aims to provide an overview of the current evidence for the role of pharmacists in diabetes care and insights into what roles pharmacists may fulfill in the future.

Health Care for T2DM Patients

The management of those with T2DM should be seen as a partnership between the patient and health care professionals, in which the latter support the former in self-managing his or her disease. Management of every patient should commence with a detailed assessment at the initial diagnosis including an appraisal of diabetes complications and risk factors for complications. This provides the basis for continuing care that includes a treatment plan, treatment administration, monitoring, and review.

Pharmaceutical care is defined as "the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life". It provides a platform for multidisciplinary collaboration, which means that the pharmacist and the doctor(and potentially other care providers) join forces to decide on the optimal treatment of the patient so as to achieve the outcome the patient desires. It requires that a professional relationship between the pharmacist and the patient is established and maintained, and records on patient's medications and other specific information are collected and evaluated. In the case of prescription medicines, a therapy plan currently needs to be developed involving the doctor and the patient; however, pharmacists may also provide input here.

T2DM PATIENTS

Initial Assessment

- Medical History
- Physical Examination
- Laboratory Evaluation

Treatment Plan

- Individualized Treatment Targets
- Individualized Treatment Plan
- Diet, exercise and antidiabetic agents
- Prevention/treatment of complications
- Patient education

Review

- Review of treatment plan
- Consider
- Adjust treatment plan
- Adjust education
- Referral

Treatment administration

- Medications prepared
- Appropriate instructions for use are provided
- Patient educated

Monitoring

- Monitor compliance to treatment plan
- Monitor treatment outcomes
- Monitor adverse treatment effects
- Monitor patient comprehension and continuing
- Educational needs

Pharmacy-based Services for T2DM patients

T2DM is one of a number of common complex conditions, including asthma, chronic obstructive pulmonary disease and heart failure, which require more time and expertise than one practitioner can reasonably provide to achieve optimal therapeutic outcomes for the patient. With the development of the concept of pharmaceutical care in which pharmacists are engaged more widely in patient care, the opportunity exists for pharmacists to have a greater role in the care of patients with T2DM

Future roles for pharmacists in T2DM management

To date, evidence supports pharmacists extending their role in diabetes care from medication supply to cognitive services which aim to assist those with diabetes achieve the best possible clinical outcomes through supporting their self-management. Realistically, pharmacists potentially have a role to play in all facets of the care of T2DM patients as depicted in Figure 1. However, widespread implementation of such services in the future will depend on legislative change, adequate funding (government and nongovernment), professional commitment, interprofessional collaboration, and consumer (patient) acceptance. Community pharmacies as a place to go to get assistance with their diabetes care. Consumers are happy to accept that pharmacists can provide them with medications and counseling; however, they have consistent concerns about the knowledge and competency of pharmacists to provide additional services, and that community pharmacies are a suitable environment to deliver them. The findings of Dhippayom and Krass support this, with participants in their study highlighting the main role of pharmacists is medication provision, with some enhancements in supporting adherence and continuity of supply. Therefore, for community pharmacy-based services to succeed, these perceptions must be changed; this will require action from within the pharmacy profession through further training, establishment of private consulting areas, changes to workflows, and proactively promoting pharmacists' capability to deliver enhanced diabetes care.

Delivery of such services within other settings such as hospitals, outpatient clinics, and community-based clinics is likely to be better received by patients, with pharmacists being seen more as a care provider than a supplier of

medicines. Evidence supports pharmacists working in these settings, either directing care or collaborating in care.

Targeting of services to those at greatest need would seem appropriate, such as patients with newly diagnosed diabetes who are often overwhelmed by the diagnosis and have a poor understanding of its management. For example, general practitioners often fail to provide adequate education for patients starting oral hypoglycemics, and community pharmacists are well placed to fulfill this role. Further, the evidence suggests that patients with poorly managed diabetes, that is, those with HbA1c > 9 mmol/L, gain the greatest benefit from pharmacist interventions, suggesting targeting such patients would be appropriate. This could be facilitated through referrals from medical practitioners or pharmacists ordering of HbA1c levels or point-of-care testing

Funding to deliver pharmacy-based cognitive services is a contentious issue, and whilst they The importance of the latter should not be underestimated, with recent work again illustrating that consumers do not perceive can be funded through a user-pays model, government-funded or third-party payer models are likely to be needed for widespread implementation of such services. For example, depending on the level of remuneration, one would envisage that a limited number of community pharmacies specializing in diabetes would offer extended services. Legislative change to allow pharmacists to manage patients' diabetes therapy either in consultation with their primary health provider or independently, which has occurred in some jurisdictions, will allow pharmacists delivering such services to have greater impact.

Diabetes screening is another area of significant need which pharmacists should engage in as many people living with the disease are undiagnosed. A large-scale trial is about to commence in Australia to evaluate community pharmacists' role in diabetes screening. This study builds upon the work of Krass et al, which demonstrated that a sequential screening program, that is, tick test followed by capillary blood glucose testing, was an effective means to detect prediabetic and diabetic patients.

II. CONCLUSION

There is significant evidence to support the role of pharmacists in providing a range of extended diabetes care services, from the screening to ongoing disease state management. However, despite this, the provision of such services generally remains limited and inconsistent. However, this is set to change, as the number of people with T2DM grows, and the capacity of traditional care providers to cope with these people diminishes. Governments, third-party payers, and consumers will all be looking for cost-effective ways to manage diabetes. Pharmacists are ideally placed to assist patients with their diabetes management within a range of clinical settings as demonstrated by current evidence. Needed now are models of practice which are evidence based, consistent, and scalable, such that they deliver the outcomes desired by all stakeholders.

REFERENCE

[1]. American Diabetes Association Standards of medical care in diabetes - 2013. Diabetes Care. 2013;36(Suppl 1):S11–S66.
[2]. Pinhas-Hamiel O, Zeitler P. The global spread of type 2 diabetes mellitus in children and adolescent. J Pediatr. 2005;146(5):693–700.
[3]. American Diabetes Association Type 2 diabetes in children and adolescents. Diabetes Care. 2000;23 (3):381–389.
[4]. International Diabetes Federation IDF Diabetes Atlas. Seventh Edition. 2015. Available from: www.diabetesatlas.org. Accessed October 28, 2016.
[5]. World Health Organization Obesity and overweight. Fact sheet [updated June 2016] [Accessed October 28, 2016]. Available from: http://www.who.int/media centre/factsheets/fs311/en/Accessed October 28,2016.
[6]. World Health Organization Diabetes Fact sheet [reviewed November 2016] [Accessed November 2016]. Available from: http:// www.who.int/mediacentre/factsheets/fs312/en/ Accessed November 27, 2016.
[7]. Fowler MJ. Microvascular and macrovascular complications of diabetes. Clin Diabetes. 2008; 26(2):77–82.
[8]. Kocur I, Resinkoff S. Visual impairment and blindness in Europe and their prevention. Br J Ophthalmol. 2002;86(7):716–722.
[9]. Diabetes Australia Diabetes in Australia. 2015. [Accessed October 28, 2016]. Available from: https://www.diabetes australia. com.au/ diabetes-in-australia. Accessed October 28, 2016.