MANAGEMENT OF DIABETES CARE SERVICES

Sumon Rahman Chowdhury[1*]

Abstract

Diabetes is a chronic metabolic disorder with short and long term consequences which requires prompt treatment sometimes even with prolonged hospitalization and increased health care costs. It is thus very important to have an effective and efficient Diabetes Multi-Specialty Health Care team to ensure early detection and prevention of complications in every Diabetes Centre. Diabetes Self-Management Education (DSME) is an invaluable tool that is associated with improved diabetes knowledge and self-care behavior, improved clinical outcomes such as lower HbA_{1C}, lower self-reported weight, improved quality of life; healthy coping; and lower costs and thus needs to be implemented and educated to every patient. Moreover, the Diabetes educator also has an important role to teach about diabetes and self management so that patients can carry out their own part of the responsibility. Educators help patients reflect on their own personal situation and priorities so that they will be prepared to make informed decisions to reach their diabetes goals. Furthermore, noncompliance of treatment amongst patients and the detrimental effects of Poly pharmacy on the patient's well-being also need to be addressed to minimize complications. Lastly, an effective patient register and recall system are crucial components of successful diabetes care within a general practice setting and a dynamic and regular process of audit is necessary to identify deficiencies and ensure improvements in practice.

Key words

DSME; Diabetes team; Diabetes educator; Polypharmacy.

1. Senior Medical Officer of Diabetes, Endocrinology and Metabolism Chittagong Diabetic General Hospital, Chittagong.

***Correspondence:** **Dr. Sumon Rahman Chowdhury**
Email: sumonrahman79@yahoo.com
Cell: 01670393031

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Introduction

Diabetes Mellitus (DM) refers to a group of common metabolic disorders that share the phenotype of hyperglycemia. Several distinct types of DM exist and are caused by a complex interaction of genetics and environmental factors. Depending on the etiology of the DM, factors contributing to hyperglycemia include reduced insulin secretion, decreased glucose utilization, and increased glucose production. The metabolic dysregulation associated with DM causes secondary pathophysiologic changes in multiple organ systems that impose a tremendous burden on the individual with diabetes and on the health care system[1].

In every 10 seconds a person dies from Diabetes related causes in the world while two other people develop diabetes at the same time. It was revealed by statistics issued by the WHO on the world health day.

Epidemiological evidences suggest that the incidence of Diabetes is increasing worldwide particularly in the developing countries. Some 425 million people worldwide, or 8.8% of adults aged 20-79 years, are estimated to have diabetes.About 79% live in low and middle income countries.The number of people with diabetes increases to 451million if the age is expanded to 18-99 years. If these trends continue, by 2045, 693 million people aged 18-99years, or 629 million of people of age 20-79 years, will havediabetes[2].

Diabetes is often diagnosed late perhaps too late. According to the UKPDS 50 % of patients in developed countries have complications at presentation. Globally diabetes results in USD 727 billion being spent yearly by people with diabetes only on health care, which corresponds to one for every eight dollars spent on healthcare[2].

In the year 2007, US$ 73,321 was spent on diabetic drugs in Bangladesh.Judging by the current growth trend of the number of people being affected by the disease, by the year 2025 it is appre hended that the expenses will be more than double in Bangladesh alone.

Diabetes Health Care Providers are an integral part of Diabetes Self-Management Education System and appropriately trained specialists or multi-specialty diabetes care teams may reduce length of stay, improve glycemic control and subsequently improve outcomes[3,4]. The Diabetes Centers should be adequately staffed with trained professionals, should be competent to perform complex investigations and should have clear objectives to accommodate the patient's justified right to integrated health care services.

Several of the common issues regarding patient health care services have been outlined in detail in this review taking into account the current diabetic healthcare scenario in Bangladesh and ways to overcome the present obstacles.

Search Strategy

Available studies and abstracts were identified through Pub Med and Medline data bases (From 1996-2017) and Cochrane data bases. Key search terms were diabetes and diabetes care services. All available studies and abstracts describing the relationship between diabetes and diabetic health care services were included. The reference list of review articles were also searched.

Discussion

Current Practice:

In my current practice as a Senior Medical Officer at the Chittagong Diabetic Hospital, Bangladesh I am facing a multitude of problems that come in the way of providing good diabetes care in the hospital:

i) Lack of Health Education in terms of Diabetes Self Management Education.
ii) Non compliance on part of the patient
iii) Lack of Audit Process and Electronic System for patient follow-up
iv) Lack of Information Technology
v) Lack of Women Education
vi) Shortage of Manpower and Equipments
vii) Lack of funding
viii Inappropriate foot screening
ix) Long waiting lines and less consultation with doctors due to large number of patients
x) Lack of a multidisciplinary Diabetes Care Team.
xi) Poverty
xii) Lack of qualified Diabetes Educator.

Organization of Diabetes Care

Diabetes Centers

Patients (And their families) require education backed up by readily available expert assistance from a multidisciplinary diabetes care team.

The Diabetes Health-Care team compromises of:

i) Consultant Diabetologist: He shall be the team leader
ii) Specialist Nurse
iii) Dietician
iv) Podiatrist
v) Nephrologist
vi) Obstetrician
vii) Vascular Surgeon
viii) Ophthalmic Surgeon
ix) Cardiologist
x) Psychologist
xi) Social Worker.

Shared clinics, e.g. between a diabetologist and a nephrologist or an obstetrician, are popular and may help to reduce the number of visits while facilitating the sharing of relevant information[5].

Annual Review

A comprehensive annual review is the cornerstone of structured Diabetes management.

Checklist for Annual Review

Discussion

- General state of health (Physical and psychological)
- Review of results of self-monitoring
- Enquiry about episodes of hypoglycemia and hyperglycemia
- Knowledge about diabetes and aspects of self-management
- Enquiry about tobacco and alcohol use
- Discussion of other diabetes-related problems, e.g. erectile dysfunction.

Physical examination

- Body weight, calculation of body mass index
- Waist Circumference
- BP measurement
- Assessment of visual acuity
- Detailed fundal examination
- Inspection of feet and footwear
- Injection sites.

Investigations

- Urinalysis-for protein (Or albumin/creatinine ratio, glucose and ketones, as appropriate
- Glycated hemoglobin concentration (Or alternative)
- Serum Creatinine and electrolyte concentrations-if proteinuria present, known renal impairment or on diuretics
- Serum lipids-every 3-5 years or more often if indicated.

Management

- Glycaemic control-diet review, antidiabetic medication, exercise
- Assessment of co-existing conditions
- Review of all ancillary medications
- Attention to modifiable cardiovascular risk factors-antihypertensive therapy, lipid-lowering therapy, aspirin
- Management of long-term complications-consider specialist referral as appropriate
- Management plan for next 12 months-specialist referrals, contraception, plans for pregnancy
- Arrange review date-patients with complications, suboptimal glycaemic control and uncontrolled hypertension will require earlier review[5].

Objectives of Diabetes Care

i) To identify people with Diabetes
ii) To relieve the acute and chronic symptoms in those people identified
iii) To inform, educate and empower people to achieve the highest possible degree of self care
iv) To optimize blood glucose control without causing frequent hypoglycemia
v) To minimize cardiovascular risk through optimizing levels of lipids and blood pressure, and encouraging cessation of smoking, weight loss in the obese and regular exercise
vi) To screen for late micro and macro vascular complications
vii) To treat late complications
viii) To provide appropriate psychological and social support for our patients
ix) To maintain a clinical database (Diabetes register)
x) To prompt patients and care-givers[6].

Diabetes Self-Management Education

Diabetes is a model disease where patient education can work wonders. According to Dr. Edward P. Joslin "The Diabetic that knows the most lives the longest". Patient education is therefore an integral part of the management of DM.

However, As soon as diabetes is diagnosed, the patient starts receiving different tips, words of caution, various do's and don'ts and even treatment options from friends, relatives and neighbor's alike. Most of these tips are rather misleading and harmful for the patient. For instance: stop eating potatoes, rice and fruits, you can get kidney failure, gangrene or blindness. Modern treatment is full of side effects, go for herbal. This initial shock of diagnosis of diabetes followed by such misguiding tips makes the patient depressed and non compliant. It creates a fear of chronic illness and subsequent life time suffering. This poor patient either wanders around hoping for an easy escape or becomes a rebel revolving against basic norms of life.

Education helps people with diabetes initiate effective self – management and copes with diabetes when they are diagnosed. DSME (Diabetes Self Management Education) helps patients optimize metabolic control, prevent and manage complications, and maximize quality of life in a cost effective manner[7].

The overall objects of DSME are to support informed decision making, self – care behaviors, problem solving, and active collaboration with the health care team and to improve clinical outcomes, health status, and quality of life in a cost – effective manner[8].

There are various evidences that illustrate the benefits of DSME. Multiple studies have found that DSME is associated with improved diabetes knowledge and self-care behavior, improved clinical outcomes such as lower HbA_{1C}, lower self-reported weight, improved quality of life, and healthy coping, and lower costs[9-13]. Patients who participate in diabetes education are more likely to follow best practice treatment recommendations, particularly among the Medicare population, and to have lower Medicare and commercial claim costs[14].

National Standards for DSME

The National standards for DSME are designed to define quality diabetes self-management education and to assist diabetes educators in a variety of settings to provide evidence – based education[8].

International collaborations such as the St. Vincent Declaration in Europe represent another facet to the quest for improved outcomes for patients. The meeting which comprised of the representatives of European government health departments and patient organizations under the aegis of the regional offices of WHO and IDF resulted in a unanimous agreement on a series of recommendations of general goals and 5 year targets of improved outcomes for patients with Diabetes and reduce the serious complications associated with the disease[5].

Noncompliance and the Role of Diabetes Educator

Before the discovery of Insulin (1921), the only treatment available for diabetes was diet therapy. This meant starvation and no carbohydrates. Over the past few decades, diet therapy has been revolutionized. Diabetes is a model disease where the proper diet therapy can work wonders. Bitter foods nullify sweet sugar in the blood, Potatoes are bad for DM. Over eating one day can be compensated by fasting the next day. Artificial sweeteners cause side effects and many other misconcepts are adopted by the general diabetic patients of the hospital. In our Country, commonly used herbal treatment consists of use of Karela, Jamuna seeds, neem, bijak wood and many others. Our patients are gullible; they get easily lured by the quacks like “Babas”, “Sadhus”, “Ayurveds”, and Homeopathic physicians and fall prey to their tactics.

Diabetes being a chronic illness, patients believes in an easy, painless and inexpensive way to cure it. Patients need to be instructed to be suspicious of such claims that are sweet music to the ear like cure for DM, and easy replacement for insulin etc.

Diabetes care does not live up to the standards set out in guidelines in most hospitals and general practices.

This can be due to poor organization and delivery of care, but can also be due to psychological barriers that are related to both the patient and health care provider[5].

Anderson and Funnell state that most studies seeking to identify the causes and remedies for non – compliance have failed to lead to a solution because they have not addressed the fundamental problem.

They identified three principles for patient self management of diabetes:

a) Patients make the most important choices.

b) Patients have control.

c) Patients get the consequences.

The role of Diabetes educator is to teach about diabetes and self – management so that patients can carry out their own part of the responsibility. Educators help patients reflect on their own personal situation and priorities so that they will be prepared to make informed decisions to reach their diabetes goals. The aim is, together with the patient, to develop a realistic self – management plan that truly fits each person clinically, psychologically and socially. This approach is believed to make the concept of compliance and adherence incongruous and unnecessary[15].

There is also evidence from randomized controlled trials that better communication and patient-provider interaction, patient empowerment, as well as training in coping skills, can improve care outcomes such as emotional health, symptom resolution, function, physiological measures and pain control[16-18].

Poverty and Lack of Women Education

Ideally every child with T1DM needs to be treated with 3-4 times injections of human insulin using disposable syringes or insulin pens and also need to self monitor their blood glucose more frequently. They should undergo tests like HbA_{1C} 3-4 times/year according to ADA guidelines, annual work up for early detection of complications and should visit the physician 3-4 times/year. Poorer countries like Bangladesh, parents of majority of such children bear the entire responsibility of heath care, medicine and accessories. Poor families find it difficult to commit a quarter of their monthly income for complete health care required by a diabetic child. This is why parents try to find shortcuts which will make the treatment less expensive. Debilitating social, cultural and economic factors in Bangladesh continue to discriminate

against girls in appalling ways. In absence of proper education and ill health due to poorly managed DM, such girls cannot become financially self reliant and independent. They ultimately become both a social and economic burden for the family[19]. To help such underprivileged children we have to establish a charitable organization. The main focus would be to provide lifelong free insulin, syringes, blood glucose strips and counseling. There are special concessions, reservations provided by the government to physically and mentally handicapped children. The diabetic children should also be provided such facilities as they are metabolically handicapped. Fortunately the prevalence of T1DM is quite low in the subcontinent as compared to the Western population. In Bangladesh, the current prevalence rate of Diabetes (among the people of 20-79 years of age) is 4.8%. It is supposed to rise to 6.1% in 2025. Almost all are type 2 DM, type 1 is relatively rare[20].

In our patients, financial constraints are a limiting factor for complete evaluation. Therefore in a particular patient judicious discretion of the physician often dictates the choice of necessary investigations. Every patient may not need to undergo all the tests.

Polypharmacy

Polypharmacy is defined as the "prescription, administration, or use of more medications than are clinically indicated, or when a medical regimen includes at least one unnecessary medication[21]." However, polypharmacy may be unavoidable, given that multiple drug therapy has become the standard of care in most chronic conditions[22].Patients with a chronic disease such as diabetes often see specialists in addition to their primary care providers. Each of these providers may prescribe medications, adding to a growing list of drugs on a patient's profile. There is a stronger tendency for drugs to be added to a patient's regimen than for drugs to be discontinued. Adding new treatments may make a previously used medication redundant[23].

As the population ages, the incidence of chronic conditions increases[24].The burden of polypharmacy falls especially hard on the elderly, who incur the highest incidence of chronic conditions coupled with reduced or fixed incomes and therefore inability to afford the cost of multiple medications[25].

Reactions to existing treatments may be misinterpreted as new medical conditions requiring treatment with additional medical or surgical intervention[26].The prevalence of problems associated with multiple medications is probably underestimated. Increasing the number of medications prescribed increases the risk of adverse reactions[27].The interaction of aging, concurrent co morbidities, pharmacokinetics, and polypharmacy places the elderly at increased risk of adverse drug reactions[28].

There are various consequences of Polypharmacy. The risk of duplication of therapy can be high; multiple agents in the same class are available, in addition to generic and brand name versions of the same medications. This potential is increased when patients see multiple prescribers without anyone conducting regular oversight of the drug regimen. Medication adherence among patients with chronic conditions is disappointingly low. Providers may be inclined to overestimate the degree of medication adherence[29]. Adherence rates are diminished by complex drug regimens, incomplete explanation of benefits and side effects, lack of recognition of a patient's lifestyle, cost of medications, and communication style with patients[30].

Adherence to a course of therapy is more likely when a patient understands the reasons for taking a medication and is involved in the decision to prescribe. Patients are more likely to have confidence in the prescriber if they are given basic knowledge of potential adverse effects and advice about what to do if such effects occur[21]. Increasingly, clinical practice guidelines are incorporating quality of life and patient preferences to increase adherence by both physicians and patients[31].

Audit Processing and Information Technology

In my hospital setting the patients are followed up on a monthly basis and treatment is based on their 2 hrs after breakfast reports and their co-morbid conditions like nephropathy, neuropathy etc. The results are hand written on their respective diabetes guide books that each person has to register and maintain once he/she becomes a member. There are relative inconsistencies as patients often don't come for routine visits, cannot recollect his/her medications, forgets to bring or loses his/her guidebook. The patient does not get to see

the same physician and has to repeat his/her complaints again and again which further distresses the patient and also results in polypharmacy as each physician prescribes a new drug as per the patients complaints. There are also long queues and less consultation hours as there is a relative shortage of attending physicians and the time constraints of manual follow up and registration.

An effective patient register and recall system are crucial components of successful diabetes care within a general practice setting. Regular audit of process is required, this pertains for hospital based clinics as well as primary care clinics.

A dynamic and regular process of audit is necessary to identify deficienciesand ensure improvements in practice. A prompted recall system is regarded as a prerequisite for successful care of diabetes in primary care.

A recent Cochrane review on interventions to improve the management of diabetes care for people with type 1 or type 2 diabetes in primary care, outpatient and community settings concluded that multifaceted professional interventions can enhance the performance of health – care professionals by prompted recall and review of patients. Furthermore, the addition of patient – oriented interventions can lead to improved patient health outcomes, and nurses can play an important role in the patient – oriented interventionsthrough education and facilitation of adherence to treatment[32]. A recent randomized controlled trial of a structured personal care program for T2DM in general practice showed improvements in glycaemic control, systolic blood pressure and cholesterol compared to routine general practice[33].

Information technology also plays a vital role in data collection. A district diabetes database is regarded as an essential entity and requires that data can be easily entered from a variety of sources. Annual review record systems with built-in data prompts and risk assessment programs can be readily incorporated into user-friendly software. Digital image-capturing enables photographs of retinal and foot lesions to be incorporated into the electronic record. Decision support may assist appropriate management by practice nurses and GPs[5].

Conclusion

Management of Diabetes Care services is a complex process which depends on several factors like proper organization, compromising of an effective and adequate Diabetes Care Team backed up by proper funding and health education. Its objectives should be to provide comprehensive care and intricate details in identifying people with Diabetes and ensuring relief of acute and chronic symptoms, screening and treating late complications as well as regular foot screening. It should also provide appropriate psychological and social support to the patients.

Proper management of Diabetes requires adequate self management education, proper compliance, Diabetes Educator, extensive funding from both through national and international organizations, eradication of poverty and extensive monitoring of polypharmacy. Adequate audit processing and information technology also plays a vital role for proper management and data collection.

Diabetes being a chronic illness is both a social and economic burden. Various studies have proved that this condition can be treated if proper organization and extensive skills are employed in the management of DM.

Disclosure

The author declared no competing interests.

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