Interruption in Health Care for a Patient with Multiple Chronic Illnesses

K L Siders

Abstract

Interruptions in the health care of persons with one or more chronic illnesses can cause catastrophic setbacks to their health or even threaten their lives. Individuals with diabetes and comorbid conditions are especially vulnerable to untoward health consequences of poor glycemic control during care interruptions. Understanding the dynamics contributing to interruptions in care helps prepare nurse practitioners assess and address those specific to their patient population. Likewise, insight into the factors contributing to or detracting from self-management helps guide the plan of care and program development. A brief case study of a woman with multiple chronic illnesses, including diabetes, will illustrate the factors leading to care disruptions.

INTRODUCTION

The case of M.S. (not her real initials) serves as an example of a patient with multiple chronic illnesses experiencing a dangerous disruption to health care access. This episodic appointment occurred at a community clinic that is part of a large, urban, multidisciplinary county health care system. County residency and financial need determines patient inclusion. Patients initiate the enrollment process and maintain their membership through periodic updates. This case study illustrates the chronic illnesses of metabolic syndrome, type 2 diabetes, and essential hypertension and explores factors related to care disruption including self-management factors and barriers to health care access. The purpose of this article is to present practical information for utilization by nurse practitioners to understand barriers to health care access, and examine strategies for improving self-care management for patients with multiple, chronic illnesses.

HISTORY OF PRESENT ILLNESS

M.S. was a 52 year-old Caucasian female with a history of diabetes, hypertension, and hyperlipidemia. She called the clinic earlier in the month reporting a need for refills of metformin, NPH insulin, regular insulin, and atorvastatin. The patient had depleted the supply of the metformin and both insulins 2 months prior and the atorvastatin 1 month prior to this appointment. The primary care physician (PCP) reviewed the patient's chart noting the last laboratory analysis and office appointment was 17 months prior. The PCP ordered laboratory tests and asked the clinic to schedule a follow-up appointment with the nurse practitioner (NP) to review the lab results and resume medical management.

At the appointment, M.S. reported following a diabetic diet and taking medications as scheduled more than 75% of the time before depleting the supply. A private physician last prescribed medications, but the patient was unable to afford a follow-up appointment. She only recently had gained access again to the county health system accounting for the medication lapse.

A review of systems reveals no pertinent abnormalities. The blood pressure was 156/89 with a pulse of 67, and the patient was afebrile. M.S. was 67 inches tall and weighed 320 pounds resulting in a body mass index of 50.3. Physical examination of the head, eyes, ears, nose, throat, lungs, heart, and abdomen were unremarkable. The fasting blood glucose was 336 milligrams per deciliter (mg/dl) with a hemoglobin A1C of 14.8% indicating an estimated average glucose of 378.1 mg/dL. The total cholesterol was 277, triglycerides 244, high-density lipoprotein (HDL) 42, and low-density lipoprotein (LDL) 186. The other laboratory results, electrolytes, complete blood count (CBC), aspartate aminotransferase (AST), alanine aminotransferase (ALT), bilirubin, thyroid stimulating hormone (TSH), and microalbumin, were within normal limits.

Diagnoses

Metabolic syndrome

This patient met 4 of the 5 criteria of metabolic syndrome established by National Cholesterol Education Program- Adult Treatment Panel-III (NCEP).1 She had high triglycerides, hypertension, central obesity, and carried a diagnosis of diabetes. The HDL, the 5th criteria, was within normal limits, but a low normal.

Uncontrolled Type II Diabetes

According to the American Diabetes Association (ADA) hemoglobin A1C greater than 6.5 is diagnostic for Type II Diabetes Mellitus (T2DM).2 The ADA's treatment goal is a hemoglobin A1C less than 7.0%. With a value of 14.8%, the patient's T2DM clearly was not controlled.

Essential Hypertension

According to the Eighth Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-8), the goal for a person with diabetes is less than140/90 mmHg.3 These guidelines are a departure from the more restrictive guidelines in this group's Seventh Report.4 The ADA recommends controlling blood pressure to a goal of less than 140/80.2 The systolic blood pressure reading of 158 was above the goal for both guidelines, but the diastolic reading of 89 was within the JNC-8 guidelines, but not those from the ADA.

Pathophysiology

Metabolic Syndrome

NCEP defines metabolic syndrome as having 3 or more of the following criteria: central obesity, hypertriglyceridemia, low HDL, hypertension, and a fasting plasma glucose greater than or equal to 100 mg/dL or a diagnosis of T2DM.1 An excess of circulating free fatty acids (FFAs) promotes insulin resistance, the hallmark of metabolic syndrome, by weakening insulin-mediated glucose uptake.5 Central obesity fosters metabolic syndrome by releasing FFAs from visceral adipose tissue directly to the liver via the portal system.6 This effect in turn increases the production of very low-density lipoproteins (VLDL) that are rich in triglycerides while protective HDL are quickly removed from circulation. In the presence of hypertriglyceridemia this results in an increase in the number of VLDL increasing the risk of atherosclerosis.7

Type 2 Diabetes Mellitus

Type 2 diabetes mellitus and metabolic syndrome are closely related, yet separate entities.8 T2DM includes insulin resistance, an over production of glucose in the liver, impaired insulin secretion, and abnormal fat metabolism.9 Not all people with T2DM have metabolic syndrome. The incidence of T2DM in people with metabolic syndrome is increased 5-7 fold compared to those without metabolic syndrome.10 In addition to the insulin-resistance found in metabolic syndrome, beta cell function may be impaired by lipotoxicity from metabolic syndrome.10 Insulin production in the pancreas increases early in the disease, but eventually the pancreas is unable to meet demand. First post-prandial glucose rises in response to the pancreas' inability to produce sufficient insulin, then fasting blood sugars rise in response to the liver's over-production of glucose, and finally beta cell dysfunction occurs.9,11

Hypertension

Essential hypertension, the most common type of hypertension, lacks a clear underlying etiology.12 Many interconnected factors contribute to essential hypertension including, but not limited to, an increased intake of sodium chloride, activation of the renin-angiotensin system, and endothelial dysfunction.12

An increase in sodium chloride increases the extracellular fluid volume raising blood pressure by increasing cardiac output. The vascular beds in the kidneys auto regulate and increase the vascular resistance to maintain blood flow. Eventually peripheral resistance becomes the driving force in sodium chloride related hypertension.12

Release of renin from the kidneys results in activation of the renin-aldosterone system, which can lead to hypertension as well as kidney disease.13 Insulin resistance also contributes to hypertension by losing the naturally protective action of insulin as a vasodilator.7

Factors Related to Care Disruption

Access to health care represents a significant factor in M.S.'s health. Initially after leaving the county health system, M.S. received care from a private physician but her care lapsed before re-entering the county health system for care. Specific barriers preventing M.S. from returning to the clinic before running out of medications were not explored during her appointment time. Understanding the factors relating to such disruptions is critical to maintain optimal health for those with chronic conditions and will be further explored.

Barriers to Health Care

Access, the fit between individuals and the health care system, was defined as a concept by Penchansky and Thomas in 1981.14,15 These authors proposed access contains 5 distinguishable, but closely related dimensions as follows: availability, accessibility, accommodation, affordability, and acceptability. A more recent taxonomy breaks the concept in 3 dimensions: financial, structural, and cognitive.16

Financial barriers, which relates to availability in Penchansky and Thomas' taxonomy, is noted as the most common barrier.15,16,17 However, other barriers are identified as preventing individuals from accessing the care they need. Researchers interested in barriers to health care created 6 focus groups comprised of patients from a family care center providing health care to urban, medically underserved residents of Wisconsin.17 Common themes from the focus group interviews were insurance accessibility, socioeconomic barriers, a lack of health literacy, and a lack of personal accountability for one's health.17 In relation to the noted lack of personal accountability was a sense of helplessness in the patients. The individuals interviewed most frequently reported their family history determined their health status which exemplifies a sense of helplessness over health.17 The researchers acknowledged the interview questions would not allow them to distinguish if the participants understood their role in their health outcomes.

A synthesis of the literature covering transportation barriers to health care concluded such barriers were common, posing the greatest threat in vulnerable populations.18 This article did not identify distance from the care facility as a clear barrier to care. However, access to a vehicle correlated with improved health care access regardless of socioeconomic status.18 In contrast, a needs assessment conducted in an underserved, rural county in Virginia revealed both a lack of transportation and geographic distance created a barrier to health care.16,19 The Virginia researchers utilized focus groups of underserved residents who identified both inconvenient facility location and hours of operation contributing to health care barriers.19

Many basic needs of the economically disadvantaged compete with their health care needs. The focus groups from the Virginia study reported preferring to spend their money on basic living expenses and believed they are entitled to quality health care.16,19 The Wisconsin group noted lack of money and insurance as the biggest barriers to care.17 This group noted participants struggling to obtain safe, affordable housing and healthy food.

Noninsured groups from 3 areas of the United States (US) were interviewed to determine the types of access barriers they experienced.20 The responses fell into the Penchansky and Thomas' 5 categories of access determinants. None of the affordability issues was outside of the expected cost and lack of insurance of the services. Availability issues reflected not knowing where to go or noting the usual source of care was no longer available. Acceptability was deemed a problem with facilities, treatment, or providers. Other barriers falling under the heading of accommodation were created by lack of available and timely appointments or a mismatch between work and appointment schedules. The study reported frequent overlaps with financial and nonfinancial barriers.20

Low Health Literacy

Low health literacy presenting as a barrier to health care is reported frequently in the literature.14,16-18 Health literacy includes basic language and math skills that enable one to find, integrate, and understand health information leading to the ability to make appropriate health decisions.21 The goal in improving health literacy involves recognizing the deficit and making the system/patient interface understandable to those with low health literacy. Well-educated and highly intelligent people when out of their element in the health care system or under stress from an illness can experience low health literacy. The US Department of Health and Human Services report notes that up to 45% of high school graduates possess limited health literacy.21 Low health literacy crosses all socioeconomic levels but affects those in lower socioeconomic and minority groups disparately.21

A component of health literacy relates to understanding insurance and possessing the ability to navigate the healthcare system. Focus group findings in both the urban Wisconsin study and the rural Virginia needs assessment noted a complexity with insurance as creating a barrier to care.17,19 As well as impacting access, low health literacy has a negative effect on diabetes self-management.22

Plan

Diagnostics

M.S. was instructed to follow-up with the clinic

physician in 3 months to review laboratory results and continue care. The ADA recommends at least quarterly patient monitoring in the face of poor glycemic control.[2] Fasting blood work, including hemoglobin A1C, metabolic profile, lipid profile, and liver profile along with urinalysis with microscopy would be obtained a week before the next clinic appointment in 3 months. Recommended testing is focused on evaluation of end-organ damage and treatment response. Kotchen recommended evaluating renal function, serum electrolytes, fasting glucose, and lipids annually and anytime in between if clinically necessary.[12]

Pharmacological Interventions

M.S.'s finances required staying within the clinic's formulary. She was restarted on metformin 1000 mg, a first-line agent for T2DM, by mouth twice a day.[23,24] Metformin reduces insulin resistance, thereby promoting some weight loss, decreasing hyperinsulinemia, and improving lipid profiles without risking hypoglycemia.[24]

NPH insulin was resumed at 25 units injected subcutaneously every morning and every evening. Titration of the NPH insulin and a sliding scale of regular insulin based on pre-prandial blood sugars were explained both verbally and in writing. The American Association of Clinical Endocrinologists (AACE) recommends adjustments in the basal rate every 2-3 days with a target of fasting blood glucose of less than 110 mg/dL.[25] AACE prefers the use of long-acting Insulin analogues such as glargine and detemir over NPH Insulin due to their smoother response over 24 hours resulting in a decreased risk of hypoglycemia. The long-acting insulin analogues also are associated with less weight gain.[25] Only NPH and regular insulin were available through the clinic's formulary due to the vast price difference. The clinic refurbished the patient's diabetic testing supplies.

M.S. was started on lisinopril, an angiotensin-converting-enzyme (ACE) inhibitor, at 10 mg/day for blood pressure control. The 2013 ADA guidelines and JNC 8 both recommend an ACE inhibitor or an angiotensin receptor blocker (ARB) for coexisting diabetes and hypertension.[2,3] ADA guidelines cite several studies that recommend ACE inhibitors as a better choice than calcium channel blockers in reducing cardiovascular events in persons with diabetes. Additionally, ACE Inhibitors have been shown to slow both the advancement of microalbuminuria and the decline of the glomerular filtration rate in individuals with diabetes.[2] The side effects and risks of lisinopril, including cough, Steven

Johnson Syndrome, and angioedema were reviewed with the patient.

Atorvastatin was restarted at 40 mg daily. According to recently published Adult Treatment Panel (ATP) -IV, atorvastatin 40-80 mg is considered high-intensity therapy and 10-20 mg moderate-intensity therapy.[26] Moderate evidence exists that an increase to 80 mg may be harmful.[26] These new guidelines recommend treating to the 10-year atherosclerotic cardiovascular disease (ASCVD) risk utilizing the pooled cohort equation. This easy to use clinical tool can be downloaded from the American Heart Association's website.[27] In diabetic persons age 40-79, high-intensity statin therapy is considered reasonable if the 10-year ASCVD risk is greater than or equal to 7.5%. M.S.' 10-year risk was calculated at 10%. The new guidelines represent a paradigm shift from treating to goal and instead treating to risk.[26] ADA guidelines recommend statin therapy for any diabetic patient who has cardiovascular disease or is over the age of 40 with 1 or more risk factors for cardiovascular disease.[2] M.S. carried 2 risk factors, hypertension and dyslipidemia. Teaching included explaining the importance of reporting myalgias to the clinic since atorvastatin has been known to cause myopathy and rhabdomyolysis.[28] A baseline ALT is recommended prior to starting a statin.

Education and Counseling

This appointment focused on reviewing M.S.' laboratory results, discussing lifestyle changes, and re-establishing medications. Education will play a key role in assisting M.S. to make the necessary life style changes. Recommended lifestyle changes were to be addressed more thoroughly during the patient's upcoming appointment with the diabetic educator in 2 weeks and reinforced at subsequent clinic encounters. For clinics without a diabetic counselor, the NP can research referral resources in the local community. ADA's website, as well as other diabetic organizations, provides quality material that can be utilized for patient education by the NP.[29] Self-management is the key to reducing the health risks associated with M.S.' chronic diseases.[30]

Self-Management

Self-management is a large determinate in the success of chronic disease management. Understanding the barriers and facilitators of self-management enhances the NP's ability to affect progress towards adopting healthy lifestyle

changes. A study to improve understanding how comorbidities affected self-management of diabetic patients found increasing numbers of comorbid conditions corresponded to a decrease in self-management.31 These very patients are the ones who most need the support of their health care team to improve their self-care and in turn their outcomes.

Changing habits is universally difficult. Changing diet and level of physical activity has been reported to be the most difficult for patients.32 Dining away from home and being offered inappropriate foods by others was reported by patients as a major obstacle to following a diabetic diet.32 Not understanding a diet plan creates barriers to self-care.33 Discouragement with poor results despite adherence leads to a feeling of helplessness and a decreased attempt at self-care for some patients.33 Patients reported their attitudes created a barrier to exercise as did discomfort and physical limitations. Forgetfulness and running out of medications were noted to impede compliance with medication regimens as was a lack of knowledge about the medications.32,33 Financial restraints affect all areas of self-management as well.32,33

A systematic review with a meta-analysis of studies comparing group-based diabetes self-management education to routine treatment found improvement in clinical, lifestyle, and psychosocial outcomes in the group-based education.34 The same meta-analysis noted that studies with the best results involved a single educator, with a duration of less than 10 months that included 6-10 sessions, and included more than 12 hours total meeting times.34   A meta-analysis was commissioned in Ontario to determine if behavioral interventions for T2DM management was effective.35 The report concluded that a moderate drop in A1C values were found with behavioral interventions compared to usual care.35 These behavioral interventions included problem solving, goal setting, and lifestyle-changes.

Another method showing some promise in improving self-management involves tele-health care utilizing remote glucometer monitoring to improve glycemic control.36 Peer coaches have been utilized to successfully improve self-care.37 Interestingly, the more supportive coaches were not necessarily found to be the most self-confident and skillful patients.

A literature review of health literacy identified the need for more easily read patient educational materials along with a need to develop strategies to change individuals'

mindsets towards utilizing technologies.22   Several studies found educational videos and pictograms were an effective way to teach those with low health literacy. The authors discussed the importance of health literacy's influence on more than access. Health literacy influences individuals' health care decision-making capacity and self-determination based on information. The National Academy of Sciences has published the proceedings from a roundtable discussion on health literacy that abounds with practical ideas for improving patient's experience with the healthcare system.36   One of the participants reported giving each patient a notebook to bring to every meeting. The notebook is used for the provider to write instructions and the patient to write questions. This strategy improves the engagement of the patient and reinforces what is taught.

Addressing Interruptions in Care

An integral part of self-management is continuity of care. The patient has the responsibility to make and keep appointments with both primary care providers and specialists such as ophthalmologists as recommended. Understanding barriers and facilitators to care interruptions will enable the NP to recognize the patient's vulnerabilities and potentially assist the patient in avoiding interruptions.

M.S. was referred to the clinic's social worker to investigate existing barriers in care and explore strategies to overcome future barriers. This referral will include evaluating the patient's understanding of how to access and navigate the county's health system. Several studies have identified patients' lack of understanding in this area contributes to barriers.17,19,39   The social worker can also further explore any evidence of psychosocial tension in M.S. as such stress has been found to interrelate with inadequate disease management and poor glycemic control.40

NPs without access to a social worker can query their patients regarding their knowledge about how to navigate the health care system. This dialogue could be as simple as making sure the patient understands how and when to make a follow-up appointment and asking if anything prevents them from following up as recommended. Creating a file with available local community resources such as transportation, housing assistance, and food banks may prove helpful. Much of this information may already be available in community directories.

Continuity of Care

Addressing the metabolic syndrome will also address the core issues with hypertension, insulin resistance, dyslipidemia, and hyperglycemia. Lifestyle changes in the way of diet, exercise, and weight loss should continue to be targeted at every clinic appointment with the NP as well as any follow-up appointments scheduled with a diabetic educator.[1,3,9,12,41] Sodium restriction, as with the Dietary Approaches to Stop Hypertension (DASH) diet, along with proper fat intake and carbohydrate control should be addressed with the patient during the diabetic educator's session and reinforced throughout future clinic appointments.[3,41] The DASH diet restricts sodium to either 2,300 or 1,500 mg per day and has been found to be effective in reducing blood pressure.[42]

Regular exercise improves glycemic control, promotes weight loss, decreases cardiovascular risk factors, and heightens well-being.[2] ADA specifically recommends encouraging patients to exercise 150 minutes per week spread over at least 3 days without going more than 2 days between exercise sessions.[1,3,41] Both the diabetic educator and the NP should reinforce the lifestyle changes at every appointment.

Long-Term Comprehensive Care

Metabolic syndrome, T2DM, and hypertension are chronic disease processes needing long term, multidisciplinary treatment. M.S. will require ongoing reinforcement of her diabetes education with inclusion of new information from future guidelines and interventions as they become available. The patient will need to have a hemoglobin A1C repeated quarterly until glycemic control is achieved and twice a year thereafter.[2,41] ADA recommends treating the risk factors for coronary artery disease, including hypertension and dyslipidemia, rather than simply utilizing screening tests.[41] Monitoring for micro vascular end-organ disease will be important over her lifetime. M.S. should undergo dilated eye exams by an ophthalmologist or optometrist yearly.[41] Yearly comprehensive foot exams are also recommended by the ADA.[41] M.S. should be taught to examine her feet daily, to report any sores or open areas, and to wear shoes at all times both indoors and outdoors.[41] Kidney function should be monitored yearly through an estimated glomerular filtration rate with the laboratory tests.[41] Neuropathy, if present, can be identified through signs, symptoms, and physical examination findings at clinic appointments.[41]

CONCLUSION

Understanding the patient's level of health literacy and adapting educational and behavioral efforts to his/her present abilities will enhance the NP's delivery of care. System changes to improve health literacy would benefit both access to care and self-management. The multidisciplinary team, including the diabetic educator, social worker, ophthalmologist, physician, nurse practitioner, and clinical pharmacist, possesses the potential to manage populations and individuals with multiple chronic diseases and improve health related quality of life. The patient is central to any team. Chronic health problems will deteriorate without the patient's active participation on the health care team. Assisting patients to avoid interruptions in care and helping patients engage fully in care through cultivating health literacy are crucial to maximizing the health potential.

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Author Information

Kathleen L. Siders, MSN, RN, FNP-C, Doctorate of Nursing Practice Student
The University of Texas Health Science Center at Houston School of Nursing
Houston, Texas