

Providing preconception care in type 2 diabetes

Abstract

Standards for diabetes care are overwhelming for patients and time consuming for providers, but uncontrolled diabetes is potentially dangerous to women of childbearing age if not carefully monitored and managed. We present a case study of a typical patient from a primary care clinic and a discussion of barriers to appropriate preconception care. Guidelines for preconception care for women with type 2 diabetes are reviewed. Women with type 2 diabetes who are at age for becoming pregnant or those who are planning a future pregnancy should receive routine work-up and preconception health care and counseling.

Keywords: type 2 diabetes, preconception care, barriers

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Abbreviations: ACOG, American College of Obstetricians and Gynecologists; ADA, American Diabetes Association; ACE-I, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; CVD, cardiovascular disease; IBW, ideal body weight; IOM, Institute of Medicine; NICE, National Institute for Health and Clinical Excellence; PCOS, polycystic ovarian syndrome; DM, diabetes mellitus; HLD, hyperlipidemia; HTN, hypertension; HPV, human papilloma virus; SORT, strength of recommendation taxonomy; Tdap, tetanus, diphtheria, pertussis; A, consistent, good-quality patient-oriented evidence; B, inconsistent or limited-quality patient-oriented evidence; C, consensus, disease-oriented evidence, usual practice, expert opinion or case series; BMI, body mass index; GDM, gestational diabetes mellitus; EMR, electronic medical record

Introduction

Prevention of complications from chronic diseases such as diabetes challenges clinicians to find practical ways to approach and deliver comprehensive patient-centered care. A large segment of the population with diabetes is comprised of women who are of childbearing age. In 2011, 15.6% of newly diagnosed diabetics were between the ages 18 to 39; expanding the age range to 18 to 44 increases the incidence to 24.5%. Nearly half of newly diagnosed patients with diabetes are women.¹ Women of reproductive age with type 2 diabetes who experience an unplanned pregnancy present a situation for all providers to reassess approaches to care. While guidelines (Table 1)²⁻⁵ are widely available, there is still much improvement to be made in primary care to provide, implement, and follow through with care plans an effort that requires a shared responsibility between provider and patient.⁶

Case

A 40-year-old African American female (G1P0010) presents to clinic with a chief complaint of amenorrhea. In addition to obesity and type 2 diabetes (hemoglobin A1C 4 months prior was 7.7%), she has hypertension and hyperlipidemia treated with an angiotensin converting enzyme (ACE) inhibitor and a statin, respectively. Her diabetes is treated with metformin and she takes an 81 mg aspirin daily. She is not taking folic acid and is not checking her blood glucose because of the cost of meter supplies. She was receiving progesterone injections for birth control but two months ago failed to show up for

her injection. Her first pregnancy was complicated by an incomplete abortion requiring dilation and curettage. She is married but does not feel support for expanding her family from her husband. Her family history is notable for diabetes in maternal and paternal grandmothers and positive for hypertension in her paternal grandfather. Physical examination is unremarkable except for a body mass index (BMI) of 35. Her urine pregnancy test is negative. Fasting blood sugar is 188 mg/dl, blood pressure is 138/78 mmHg and A1C is 8.1%. What are the goals of management if the patient does not intend to become pregnant and what education should be offered to the patient?

Barriers to preconception care

Impacting the care of women with type 2 diabetes who are planning to or become pregnant is a shared responsibility and partnership between practitioners, patients and their families. However, many pregnancies are not planned in patients with diabetes and the importance of adequate glucose control becomes even more important during child bearing years. A multitude of barriers to preconception care can make a difficult situation seem overwhelming. These barriers exist for all involved in the care of the patient.^{7,8} Obvious barriers for the case presented included financial issues, lack of family support, and negative experiences from a past pregnancy.

Time commitment

Caring for diabetes can be time-intensive and should be recognized for improved patient success. A cross-sectional analysis of 1482 patients with diabetes found that about one hour per day was spent on diabetes self-care (foot care, exercise, food shopping and preparation).⁹ However, in one-third to one-half of patients these activities were often skipped. In this study,⁹ patient self-testing of blood glucose was associated with engagement in self-care activities. The commitment required for diabetes self-care behaviors (testing blood sugar, exercise, healthy dietary practices, stress reduction) is often an obstacle and an important factor that must be considered for patient success.

Time constraints limit the clinician's ability to assess a patient's knowledge of diabetes and health literacy. Diabetes is a complex disease that has multiple quality-of-care issues and the related comorbidities that require close monitoring. As more patients seek services from primary care providers, there is increasing emphasis

on seeing higher patient volumes at the expense of providing individualized patient education.

Nutritional and medical resources

Cultural practices and communication barriers can have substantial influence on glycemic control, especially those practices relating to lifestyle. Maintaining healthy eating habits and reducing BMI through diet and exercise should be advocated with every patient visit. The struggle with obesity remains a constant problem for women with type 2 diabetes. Many patients live in areas where providers and educators are not readily accessible or where exercising outdoors is not feasible. Even when resources are accessible, inadequate or absent insurance prevents some patients from seeking care. The cost of healthcare visits, medications, testing supplies, a gym membership or exercise coach, and healthy food prohibit many patients from being able to monitor, manage, and treat their diabetes. The lack of perceived value of diabetes education may lead to decreased participation and increased missed or cancelled appointments. Nonetheless, patients should be referred and encouraged to participate in structured diabetes education.¹⁰

Patient perceptions

Although a paucity of literature remains on the subject, several publications in the mid 1990’s explored the perceptions of diabetes during pregnancy.^{7,11-14} Common themes throughout these publications are feelings of anxiety, stress, and perceived loss of control. One study used focus groups of women with pregestational diabetes or gestational diabetes mellitus (GDM) and found a need for mental and emotional support.⁷ In a survey of women with previous GDM, they report less well-being, mental health, and vigor during pregnancy along with a less positive pregnancy experience. While diabetes negatively influenced their perception of health, it did motivate them to adopt a healthy lifestyle.¹¹

In another survey, women diagnosed with GDM were interviewed regarding the psychosocial consequences of diabetes.¹² Most of the women involved reported experiencing fear, anxiety, and depression following the diagnosis of GDM. Much of the fear they experienced

centered on the health of their baby. Their negative feelings about GDM and the need for diabetes management during pregnancy resulted in a perception that the pregnancy was “not normal”. In a prospective study, women who tested positively for diabetes have been reported to have lower perceptions of health compared to women who screened negatively for diabetes.¹³ Patient expectations and perceptions before, during and after conception must be viewed comprehensively and gauged relative to previous gestational experiences.¹⁴ Provider awareness and sensitivity to these perceptions is necessary to deliver comprehensive, patient-centered services to these patients.

Provider approaches to care

Assessing and documenting risk

Some authorities advocate labeling women with type 2 diabetes who are of reproductive age as members of a high risk group.¹⁵ While that approach might work to identify patients, many women do not intend to conceive and therefore do not perceive the need for preconception planning. Practical ways to improve the delivery of care to reproductive age women with type 2 diabetes already exists. Programming an electronic medical record (EMR) to provide specific patient care advisories can help clinicians identify necessary screenings and care considerations. A scheduled annual visit to assess conception risks should take place with the primary care specialist.¹⁶ This annual visit should address risks not only at the patient level (weight, screening lab work, medications) but also at the familial level, since a family history of diabetes and obesity impacts the patient’s risk and motivation to decrease her risks.³

Medical decision making

Outlined in (Table 1) are guidelines that warrant discussion of goals for care. The emphasis of glucose optimization, weight management, and blood pressure control should be ongoing even if the patient is not contemplating conception. Preconception counseling, glucose control prior to conception, folic acid use, family planning, teratogenic medications, oral medicine for type 2 diabetes treatment, and vasculopathy are also topics that are an essential part of patient management.

Table 1 Guideline for Preconception Counseling in Patients with Diabetes

Guideline	ACOG ²	ADA ³ , Consensus Summary of Evidence ⁴	NICE ⁵
Preconception counseling visits	Any visit	Incorporate into the routine diabetes clinic visit for all women of childbearing potential ³	From adolescence onwards, advise women about the importance of avoiding unwanted pregnancy
Glucose control prior to pregnancy	Mean capillary glucose average of 100mg/dl with A1C no higher than 6%	A1C should be <7% before conception is attempted ³	A1C <6.1%. Women whose A1C is >10% should be strongly advised to avoid pregnancy
Folic acid	400mcg/day; higher doses may be beneficial, especially in presence of other risk factors for neural tube defect	600mcg/day in preconception and prenatal periods through supplementation or fortified food sources ⁴	5mg/day until 12weeks gestation to reduce the risk of neural tube defect
Family planning/ Contraception	Low-dose combination (or progestin-only if vasculopathy or smoking history) oral contraceptives or intrauterine devices; consider sterilization in the setting of serious vasculopathy or if future pregnancy undesirable	Educate about the risk of malformations associated with unplanned pregnancies and poor metabolic control. ³ Use of contraception at all times, unless conception is desired and A1C at goal ³	Reach good glycemic control before discontinuing contraception to reduce but not eliminate the risks of miscarriage, congenital malformation, stillbirth, and neonatal death
Commonly used teratogenic medications	Discontinue ACE inhibitors and ARBs before conception and do not use during pregnancy	Stop ACE inhibitors, ARBs, and statins when pregnancy is anticipated ⁴	Discontinue ACE inhibitors, ARBs, and statins before pregnancy or as soon as pregnancy is confirmed

Table Continued...

Guideline	ACOG ²	ADA ³ , Consensus Summary of Evidence ⁴	NICE ⁵
Oral agents for type 2 diabetes	Glyburide does not cross the placenta, used in gestational diabetes Metformin is category B in pregnancy and used as an infertility treatment for PCOS, some reports of its use in pregnancy, long-term effects not well studied in-utero	Oral medications for treatment of type 2 diabetes should be stopped and insulin started and titrated to achieve acceptable glucose control before conception ⁴	Metformin may be used for women as an adjunct or alternative to insulin in the preconception period and during pregnancy. Discontinue all other oral agents before pregnancy
Blood pressure (BP) control	Hypertension should be controlled before pregnancy	Treat to a blood pressure <130/80mmHg ⁴	No recommendations given
Obesity/weight control	During pregnancy, women of normal body weight should increase their caloric intake to 30-40kcal/kg/d; those who are >120% of IBW should decrease their caloric intake to 24kcal/kg/d; those who are <90% of IBW should increase their caloric intake to 30 to 40kcal/kg/d. A registered dietician can be of value	Assess pregravid BMI and target weight gain at the lower range of IOM recommendations according to BMI group. ⁴ Give individualized medical nutrition therapy by a registered dietician ⁴	Give weight loss advice for a BMI >27 via a structured education program
Vasculopathy	Evaluate for nephropathy (24hour urine protein and creatinine clearance), retinopathy (comprehensive eye exam), and CVD with electrocardiogram	Evaluate and, if indicated, treat for diabetic retinopathy, nephropathy, neuropathy, and CVD ³	Before pregnancy, offer retinal assessment and renal assessment (urine microalbumin, 24hour urine protein, and serum creatinine)

ACOG, american college of obstetricians and gynecologists; ADA, american diabetes association; ACE-I, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; CVD, cardiovascular disease; IBW, ideal body weight; IOM, institute of medicine; NICE, national institute for health and clinical excellence; PCOS, polycystic ovarian syndrome

There is need for re-evaluation of practice when considering treatment options in reproductive age women. Standards for preconception care for women with diabetes should also be evaluated with regard to the strength of evidence to support the behavior and goals of care (Table 2).^{3,4,7-19} Special consideration must be paid to reproductive age women because many classes of commonly prescribed medications are contraindicated in pregnancy. One study of 200 women of child bearing age indicated that ACE inhibitors and angiotensin receptor blockers (ARBs) were used in 158 of the

patients.²⁰ Similarly, in the same study, statins (the standard of care for cholesterol management) were prescribed in 88 of the patients; no outcome data was collected regarding adverse events.²⁰ Avoidance of diuretic agents should also be considered because of potential fluid and electrolyte imbalances.^{15,21} The use of medications with a high risk of teratogenicity was very high in this cohort, and may be just as frequent in other primary care practices, warranting preventive interventions to a wide population of women at risk of conceiving.

Table 2 Preconception Care in Diabetes

Recommendations	SORT
·Assess the woman's BMI and dietary risks in regards to obesity ^{18,21}	C
·Screen all diabetic women for depression ¹⁷	C
·All women who smoke should be encouraged to quit at every DM visit ¹⁸	A
·Update immunizations such as hepatitis B, Tdap, rubella, influenza, HPV, as indicated ^{17,21}	C
·All women with diabetes of childbearing age should take a folic acid supplement to prevent spina bifida ^{18,21}	A
·Organize a multi-disciplinary approach to prepare women with DM for pregnancy ⁴	B
·A1C should be <7% before conception is attempted ⁴	B
·Preconception counseling should be incorporated into DM visits in anyone of childbearing age ³	C
·Offer nutrition and exercise counseling before patient attempts pregnancy ²²	C
·Stop ACE-I/ARBs when pregnancy is anticipated ⁴	A
·Discontinue statins when pregnancy is anticipated ⁴	C
·Counsel women of childbearing age with DM about the risks and benefits of meds that are contraindicated in pregnancy ³	C
·Screen all diabetic women considering pregnancy for thyroid disease ⁴	B
·Treat to a blood pressure goal of <130/80 before conception occurs ⁴	B

Table Continued...

Recommendations	SORT
•Rule out and treat retinopathy, nephropathy, neuropathy, and CVD in women with DM who are considering pregnancy ^{3,4}	B
•Screen for standard CVD risk factors (HTN, HLD, smoking) ⁴	B

ACE-I, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; CVD, cardiovascular disease; DM, diabetes mellitus; HLD, hyperlipidemia; HTN, hypertension; HPV, human papilloma virus; SORT, strength of recommendation taxonomy; Tdap, tetanus, diphtheria, pertussis

SORT criteria

A: Consistent, good-quality patient-oriented evidence

B: Inconsistent or limited-quality patient-oriented evidence

C: Consensus, disease-oriented evidence, usual practice, expert opinion or case series

As with any patient with diabetes, a woman with diabetes of childbearing age should be made aware of the importance of appropriate glucose control and the risks and benefits of medications. Preconception counseling should be given at these visits and contraception offered if she does not desire pregnancy or will remain on teratogenic medications. If these goals are not met, her safety and the safety of an unborn child are at risk.

Case follow-up

The patient is advised to start a prenatal vitamin with an extra 1 mg of folic acid. Her ACE inhibitor and statin are continued but with the understanding that these are unsafe in pregnancy and at the next follow-up a discussion of alternative blood pressure and lipid medications will be discussed. Her metformin is increased. To help prevent an unwanted pregnancy, she is placed back on injectable progesterone and is given a follow-up appointment to discuss longer acting forms of birth control to reduce the risk of noncompliance. She is referred to diabetes education for nutrition and exercise counseling with the hope that group education will be of interest to her. She has scheduled a visit today for family planning.

Conclusion

Women of childbearing age with diabetes should be evaluated for preconception care with consideration of patient barriers that may impede follow-up. Guidelines for preconception counseling and management in patients with diabetes are available to help providers plan preventive and routine care.

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Conflict of interest

Author declares that there is no conflict of interest.

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