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DIABETES IN PREGNANCY: PREPREGNANCY CARE FOR TYPE 1 AND TYPE 2 DIABETES

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Abstract

Preconception counseling is the education of, and the discussion with, women of reproductive age about pregnancy and contraception. It is essential component of every consultation in primary and/or specialist care. Preconception counseling is complex and not something that can be given in 2 minutes, on just one occasion, at the end of a routine diabetes consultation. It is responsibility of all healthcare professionals delivering diabetes care to deliver preconception counseling. It is preferable for pregnancy care to be delivered by the multidisciplinary team who will care the women during her pregnancy, so that relationship between the patient and members of the team can be developed before the pregnancy begins. The use of a pre-pregnancy protocol may be useful for documentation of all the different aspects of pregnancy care. Here is a proposal for a such protocol possible to be applied currently in our country.

key words*: pregnancy, diabetes, education, multidisciplinary team.*

Background

Pre-pregnancy care for women with diabetes was introduced over 30 years ago and is associated with improved pregnancy outcomes. However, overall pregnancy outcomes remain very poor for women with diabetes with only a third receiving pre-pregnancy care. Worldwide, Type 2 diabetes is the most common type of diabetes to complicate pregnancy. Women with Type 2 diabetes are more likely to enter pregnancy with obesity and taking potentially teratogenic medications. It is therefore essential that all healthcare professionals delivering diabetes care to reproductive-age women and female adolescents understand the importance of pre-pregnancy care and are able to provide preconception counseling at routine consultations with women of reproductive age [1, 2].

Practice points

Pre-pregnancy care is the additional support needed to prepare a woman with diabetes for pregnancy at least 6 months before pregnancy. A principle goal is to advise and support the woman to achieve

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optimization of glycemic control before conception.

Pre-pregnancy care for women with Type 1 diabetes is associated with improved glycemic control in early pregnancy and a three-fold reduction in the risk of major congenital malformation in the offspring [3, 4].

Pregnancy outcomes for women with Type 2 diabetes are the same or worse as those for women Type 2 diabetes.

Preconception counseling includes discussion with the patient about future plans for pregnancy, contraceptive advice, education about the increased risks associated with unplanned pregnancies, and advice on how to access pre-pregnancy care [5].

Pre-pregnancy care also includes commencement of folic acid supplements, discontinuation of oral medications that have teratogenic potential, such as statins and ACE inhibitors, smoking cessation, and dietary input to encourage a healthy weight before pregnancy [6, 7].

Case history

Mary, a 25 year old, was delighted to find she was expecting a second baby. Her first pregnancy had been complicated by gestational diabetes for which she was treated with diet from 20 weeks until delivery. Despite advice to lose weight, she had become depressed following the pregnancy and gained 9 Kg. After two years she had been diagnosed with Type 2 diabetes. She found it difficult to keep to the recommended diet and required metformin and gliclazide to keep her blood glucose controlled. Recently she has been started on treatment for hypertension.

She was 9 weeks' pregnant. Her doctor referred her urgently to the diabetic antenatal clinic where she was shocked to discover she would need insulin treatment during her pregnancy. Her HbA1c at this visit was 8,4%. She commenced twice-daily insulin injections and discontinued her metformin and gliclazide. Her blood pressure medication was changed and she was prescribed folic acid tablets.

Her 20-week fetal echocardiogram showed a ventricular septal defect. After 20 weeks, her diabetes became more difficult to control and she was changed to four insulin injections daily. When her blood pressure increased at 28 weeks, a second oral antihypertensive medication was added. Development of pre-eclampsia led to an emergency cesarean section at 35 weeks. The baby was transfered to the neonatal intensive care unit for treatment of hypoglycemia. The latter led to difficulties establishing breastfeeding. She was informed that the baby would require surgery later to correct the cardiac defect.

Questions

How effective is pre-pregnancy care in reducing risks of complications in women with diabetes?

What evidence is there for pre-pregnancy care in women with Type 2 diabetes?

What should preconception counseling include?

Why do women not access pre-pregnancy care?

Is pre-pregnancy care cost-effective?

The differences between women who do or do not attend for pregnancy care have been well-documented [8, 9]. (fig.1 a and fig.1 b)

In particular, many women with Type 2 diabetes have often received little or no preconception counseling and no pre-pregnancy care [10].

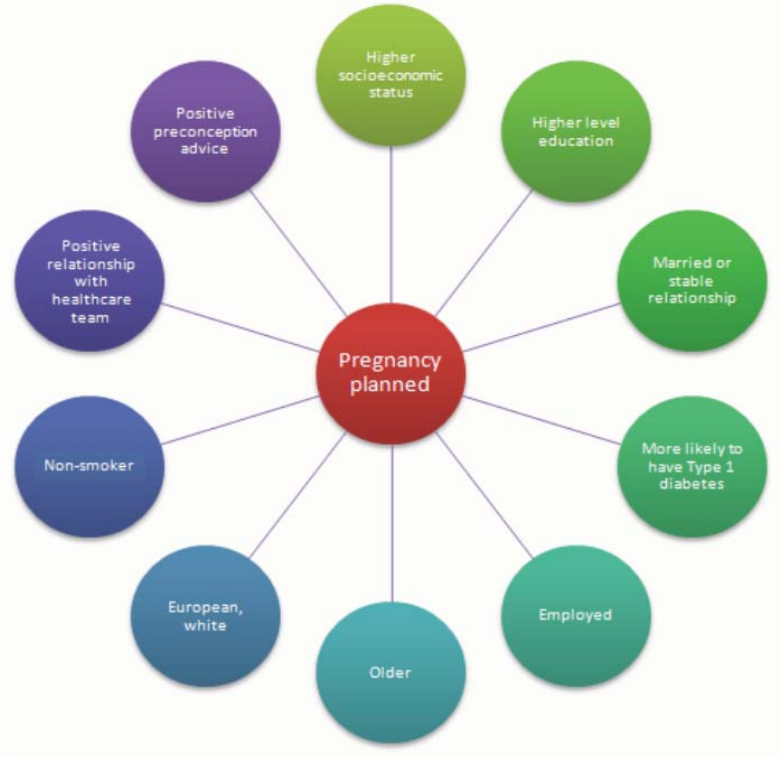

Figure 1.a. Differences between women with diabetes who have plan their pregnancy and have prepregnancy care and women who do not.

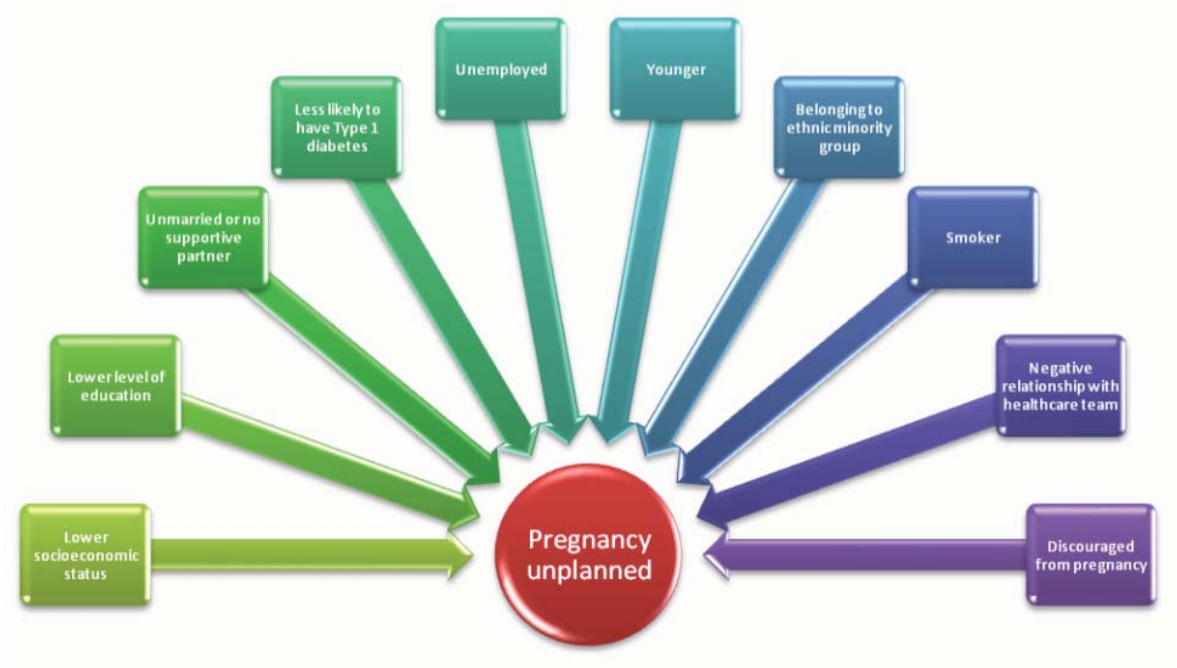

Figure 1.b. Differences between women with diabetes who have planned their pregnancy and have prepregnancy care and women who do not.

There are no simple solutions to increasing the utilization of pre-pregnancy care, but the following recommendations may be useful when developing a pre-pregnancy service [11, 12].

1. Education of healthcare professionals involved with reproductive age women and adolescents who have diabetes about the importance of preconception counseling and pre-pregnancy care [13].
2. Preconception counseling to be given to, and documented for, all women with Type 1 and Type 2 diabetes, on a regular basis [14, 15].
3. There should be easy access to pre-pregnancy care for all women with diabetes.
4. Positive information about pregnancy should be given as far as possible to encourage a partnership between the women and her diabetic team [16].
5. Risks must be explained but the woman's wishes must also be respected and supported.
6. Blood glucose targets should be individualized and agreed upon in consultation with the women and her partner [17, 18].

Components of a prepregnancy service

The are two separate major components to pre-pregnancy care:

- preconception counseling, which involves discussions, education;
- pre-pregnancy care, which involves planning a pregnancy in conjuction with healthcare professionals.

Preconception counseling

Preconception counseling is the education of, and the discussion with, women of reproductive age about pregnancy and contraception. It is essential component of every consultation in primary and/or specialist care.

Preconception counseling is complex and not something that can be given in 2 minutes, on just one occasion, at the end of a routine diabetes consultation. It is responsibility of all healthcare professionals delivering diabetes care to deliver preconception counseling [19, 20].

Discussion about future pregnancy plans

Education about what pre-pregnancy care is and how this can improve pregnancy outcomes.

Education about increased risks of poor pregnancy outcome with poor glycemic control before and during early pregnancy.

Advice about how to access pre-pregnancy care, including contact details for self-referral to the pre-pregnancy care team.

Education of women with Type 2 diabetes about stopping oral hypoglycemic agents prior to conception and possible need for insulin before and/or during pregnancy [21,22].

Documentation about use of and provision of contraception, and advise about contraception. This may involve a discussion of different types of contraception and how to obtain emergency contraception. It is important to emphasize the importance of continuing reliable contraception until optimization of glucose control has been achieved when planning a pregnancy [23].

Education about necessity for commencement of folic acid supplements before pregnancy.

Education about avoidance of statins, angiotensin-converting enzyme inhibitors, and angiotensin-receptor blockers during pregnancy.

Discussion about the importance of urgent referral to a diabetic antenatal clinic should an unplanned pregnancy occur.

Documentation of any discussion/ education. In particular, preconception counseling should be documented at all annual reviews.

Pre-pregnancy care

Pre-pregnancy care is the additional care needed to prepare a woman with diabetes for pregnancy, and involves a close partnership between the woman and healthcare professional [24]. It includes optimization of glucose control, prescribing folic acid supplements, avoidance of potentially teratogenic medication, and discussion of maternal and fetal risks [6, 9].

Pre-pregnancy care should ideally begin 6-12 months before a woman with diabetes embarks on a pregnancy [14, 18]. The time depends on several factors, including current level of glycemic control and presence of diabetic complications [12, 20].

A suggested care pathway is shown detailing the components of pre-pregnancy care (fig.2). It is preferable for pregnancy care to be delivered by the multidisciplinary team who will care the women during her pregnancy, so that relationship between the patient and members of the team can be developed before the pregnancy begins. The use of a pre-pregnancy protocol may be useful for documentation of all the different aspects of pregnancy care. Here is a proposal for a such protocol possible to be applied currently in our country (Chart 1).

PREPREGNANCY CARE PATHWAY
FOR WOMEN WITH TYPE 1
AND TYPE 2 DIABETES

At every visit, ask patient about plans for pregnancy within 12 months.

Keen for pregnancy in next 12 months.

Figure 2. Prepregnancy care pathway possible to be applied in our country

Contraception

- document use of effective contraception;
- continue contraception until optimum HbA1c achieved.

Optimize glucose control

- aim for HbA1c as close to normal range as possible without significant hypoglycemia;
- advise home glucose blood monitoring (HGBM), 4-7 tests daily;

- fasting glucose < 5,6mmol/l (<101mg/dl);
- pre-meal glucose < 6mmol/l (<108mg/dl);
- post-meals < 7,8mmol/ l (<140mg/dl);
- intensify insulin regimen in T1DM (type 1 diabetes) if needed, basal-bolus regimen or insulin pump;
- counsel about lack of data on use of long-acting insulin analogs in pregnancy;
- if Type 2 diabetes, stop oral agents and initiate insulin if suboptimal glucose control.

Hypoglicaemia

- educate about increased risk of hypoglycemia and loss of hypo awareness during pregnancy;
- educate family about use of glucagon;
- advise the patient she must test blood glucose before driving.

Diet and exercise

- smoking and alcohol cessation advice;
- consider education of carbohydrate counting;
- consider recommendation of weight loss;
- encourage regular exercise.

Prescribe folic acid supplements

- supplemental dose may be 400μg to 5 mg daily.

Screening for diabetic complications

- if retinopathy present, refer to ophtalmogist;
- if proteinuria or reduced GFR (glomerular filtration rate) are present, refer to nephrologist;
- assess cardiac status and consider referral to cardiologist;
- check thyroid function tests.

Review other medication

- stop ACE (angiotensin-converting) inhibitors, ARBs (angiotensin-receptor blocker), statins, diuretics;
- treat hypertension with methyldopa or labetalol.

Counsel about risks of diabetes and pregnancy

- to fetus: miscarriage, malformations, stillbirth, neonatal death, macrosomia;
- to pregnancy: increased risk of severe hypos and DKA (diabetic ketoacidosis). Educate about sick day rules.

Risks of retinopathy and nephropathy.

Consider referral to obstretician or perinatologist.

Chart 1. Prepregnancy proforma for use by hospitals in Roumania.

PREPREGNANCY PROFORMA FOR USE BY HOSPITALS IN ROUMANIA						
Patient name/code……			Date of visit…….		Post code……	
Pregnant		Parity		Date of birth	Type of diabetes	
YES	☐	YES	☐	……..…….	Type 1	☐
					Type2	☐

NO	☐	NO	☐			
					other	…….....……

Diabetes complications				Ethnicity			
retinopathy	☐	nephropathy	☐	caucasian	☐	asian	☐
neuropathy	☐	vascular	☐	afro-caribbean	☐	other	.....…...

Folic acid				Diabetes therapy			
none	☐	5mg/zi	☐	diet alone	☐	sulphonylurea	☐
400µg/zi	☐	started	.....….	insulin	☐	metformin	☐
				glitazone	☐	other	….....…..

Other therapy				Insulin therapy			
statin	☐	5mg/zi	☐	pump	☐	number	☐
antiepileptic	☐	other	☐	injections	☐	total daily dose(units)	☐

Rubella immune		Current HbA1c	Target HbA1c
YES	☐	…….....…… ….	…….....……
NO	☐		

Weight	Height	Contraception	Smoking

……	……..... ..	YES	☐	NO	☐	YES	☐	NO	☐

Pre-pregnancy care health professionals seen							
educator	☐	dietitian	☐	multidisciplinary team			☐
midwife	☐	diabetologist	☐	obstetrician	☐	other	…… …..

Severe hypo in last 12 months				DKA in last 12 months			
YES	☐	NO	☐	YES	☐	NO	☐

Risks discussed			
hypoglycemia/warning signs change	☐	pre-eclampsia increased risk	☐
DKA	☐	caesarean delivery rate 66%	☐
congenital malformations 2xgreater risk	☐	Stillbirth 5x greater risk	☐
perinatal death 3x greater risk	☐	macrosomia risk 50%	☐
premature delivery 3x greater risk	☐	increased BMI	☐

Follow-up pre-pregnancy visits			
Date	……/……../……..….	HbA1c	……/……../……..….
Date	……/……../……..….	HbA1c	……/……../……..….
Date	……/……../……..….	HbA1c	……/……../……..….
Number of phone contacts :			
Number of clinic visits :			

Educator includes diabetes specialist nurse or certified diabetes educator

Future research

The effectiveness of pre-pregnancy care on improving pregnancy outcomes in Type 1 diabetes is well-documented. In particular, a recent study has shown that "*documentation of achievement of an optimal haemoglobin A1c prior to discontinuation of contraception*" was the marker associated with the lowest risk of adverse outcome [21].

However, there are many important areas for further study. It is essential we increase our understanding of why so few women who have diabetes and no barriers to obtaining preconception care will not access that care.

Pre pregnancy care is one of the most effective ways to improve pregnancy outcomes in diabetes. Greater awareness both for women with diabetes and healthcare professionals is essential if we are to improve outcomes.

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