PedsCases Podcast Scripts

This is a text version of a podcast from Pedscases.com on "Types 1 Diabetes – Part 2." These podcasts are designed to give medical students an overview of key topics in pediatrics. The audio versions are accessible on iTunes or at www.pedcases.com/podcasts.

Type 1 Diabetes- Part 2:

Developed by Alkarim Velji and Dr. Rose Girgis for PedsCases.com.
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Introduction

Hi everyone. My name is Alkarim Velji. I'm a medical student at the University of Alberta. This podcast was developed in conjunction with Dr. Rose Girgis, a pediatric endocrinologist at the University of Alberta.

This podcast is the second and final part in a series on type1 diabetes. This podcast will focus the different types of insulin therapies and give an approach to the long-term management of an adolescent with T1DM.

Clinical Case

You are working with a pediatric endocrinologist. You are about to meet a 12 year old female patient with T1DM who was referred to you from the Emergency Department. She presented there with diabetic ketoacidosis. Your preceptor wants you to counsel the patient on the different insulin therapies and help her find a method that works best for her.

What types of insulin therapies are you aware *of!* What are the pros and cons of each?

Insulin Therapies:

The choice of insulin regimen depends on many factors, including the child's age, duration of diabetes, family lifestyle, socioeconomic factors, as well as family, patient and physician preferences. The Insulin requirements are based on weight and age.

The three main types of delivery methods include:

- Syringes
- Insulin Pens
- Insulin Pumps

Upon initial diagnosis and treatment, a patient may exhibit excellent glycemic control. This is known as the honeymoon period. At the end of the honeymoon period, more intensive management may be required to continue meeting glycemic targets.

Initially, patients can be started on a treatment method consisting of a mixture of intermediate and short acting insulin given at breakfast and supper. This is the twice a

day method Or, they can be given a mixture of intermediate and short acting insulin at breakfast, short acting at supper, and intermediate at bedtime. This is the thrice a day method.

In an adolescent though, two ideal methods of intensive diabetes management have been used: multiple daily injection (MDI) regimens using syringes or pens. The other is a continuous subcutaneous insulin infusion (CSII, insulin pump therapy).

Children require combinations of rapid, and intermediate/ long acting insulin. In multiple daily injections, a long acting insulin is given about once a day and it has little to no peak. This is the basal dose. Short acting doses are given before eating so as to mimic the insulin spike that should occur as one eats. This is the bolus dose. The major downside to this method is that the multiple injections are given/day.

On the other hand, Insulin pumps are worn on the body (on a belt or in a pocket). A catheter attached to the pump is inserted subcutaneously. The pump delivers rapid acting insulin continuously to maintain blood sugars within a target range. With meals, a bolus of insulin can be delivered based on the carbohydrate count in the meal. Pumps, however, are very expensive and some patients do not like the idea of having something implanted under their skin.

Both methods require patients to have a good knowledge of carbohydrate counting and can provide the patient with flexibility with what and when they eat. *AB* well, both methods allow for the insulin dose to be modified if the patient is exercising.

With all three delivery methods, the site of injection must be rotated to avoid excess fat deposits "lipohypertrophy" from forming.

Types of Insulin:

Rapid-acting insulin analogues (clear) Rapid insulins start acting within about 10-30 minutes and peak around one hour and their action lasts from 3 to *5* hours duration.

- Insulin aspart (NovoRapid)
- Insulin lispro (Humalog)
- Insulin glulisine (Apidra) GLOO LIS EEN APE I ORA

Intermediate insulins:

These insulins start acting within about two hours and peak at about *5* to 8 hours and their action last up to 18 hours

Humulin N

NPH

Long acting insulins:

These insulins start acting within 90 minutes and last 16 (Levemir) to 24 hours (Lantus) with a minimal peak.

Detemir (Levemir)

Glargine (Lantus)

Approach to Adolescents

Now that your patient bas an understanding of the different types of insulin, your preceptor asks you to develop a long-term strategy for her.

How does diabetic management of an adolescent differ from that of an adult?

The habits formed during early adolescence tend to be more deeply rooted than those developed later in life. However, during adolescence, most patients experience worsening glycemic control. Their HbA1C rises and can remain poor for a long period. Adolescent females have a higher associated risk of metabolic dysfunction as well. They are more likely to develop excess body weight, insulin resistance, and dyslipidemia compared to their male counterparts.

Although, some of these changes are associated with the hormonal changes inherent to puberty. Particularly with diabetes, the longer a patient bas poor control, the less likely they are to improve and less likely to attend follow up sessions. Therefore, during this habit forming stage of life, with the risk of poor control so prevalent, it becomes our goal to ensure an effective management plan is in place.

The overall approach to an adolescent with T1DM includes:

- Repeated age-appropriate education
- A multidisciplinary approach
- Development of self-care strategies and support structures
- An external motivation source, if necessary

Let's start with the "repeated age-appropriate education"

Patients should be educated about the risks of poor control and benefits of positive management strategies. As patients get older, the depth of the discussion should grow deeper. With each visit then, they are able to build on their prior knowledge and continuously develop their understanding. Developing a strong education helps to empower both the patient and family to take control of the diabetes.

The adolescent and family should meet with a nurse, dietician, mental health professional as well as a physician. The team along with the patient and family can establish individualized goals that fit within the patient's reality. By participating in goal creation, the patient is more likely to achieve the goals and less likely to be confused about what is expected. By establishing a common goal, the multi-disciplinary team can give different supporting perspectives and ensure that the patient has a variety of strategies at their disposal.

Again, we're dealing with an adolescent. The long-term goal is to have your patient learn to function as an autonomous individual. How does this happen? Involve the parents. Parents need education on how to slowly transition responsibility onto their child. Unfortunately, this is not an easy task for parents. Many parents like to be in control to ensure their child's safety. The goal is to help the family renegotiate their respective roles in diabetes management, ensuring that the adolescent is given sufficient responsibility

without being overwhelmed.

So, you give your patient some of the basic education regarding diabetes that you learnt from our previous podcast. She makes her rounds with the entire diabetes team. You see her in the hall as she's leaving and ask her how her day has gone. She responds saying, "I understand what's going on. It sucks and I just don't care. It's too hard to take care of and I hate carb counting. Everyone looks at me funny when I have to inject myself. It hurts. And I hate it."

What do you do then? How can you help her manage her diabetes now if she has the basic education and has met the team?

With some teenagers, further education does not necessarily function as a great motivator. Giving education is still important. However, physicians need to also focus establishing strong self-care strategies, support structures, and providing any additional extrinsic forms of motivation.

The adolescent with diabetes needs to be able to cope with disease and *want* to have good management of it Without this desire, particularly with adolescents, further education is not as useful.

Adolescents who have established positive self-care strategies generally have a lower HbA1C.

Think back to when you were a teenager. Remember all the craziness of it. It is generally an exceedingly stressful part of one's life. There's the challenge of figuring out who you are while surviving the turbulent times of middle school and handling academic and social pressures. And that's just your average teenager. Many more also have to cope with trouble at home or a lack of home, financial insecurity, and a low self-confidence. The added pressure and stress of managing TIDM can often be too much for patients. They can be disruptive, lack motivation, be in denial about the diabetes, become depressed, or start abusing drugs and alcohol. Furthermore, they may feel as ifthey are different and that they are isolated from their peers because of the diabetes.

Teenagers with diabetes are frequently embarrassed of having to give themselves an injection or check their blood glucose in front of peers. All of this is additional emotional stress that can compromise psychosocial development. Therefore, many adolescents with diabetes may experience a sense of powerlessness.

One way that some adolescents perceive to gain control is by sabotaging their diabetes. They may eat whatever they want or skip meals. A fairly common method is also to omit insulin, often to stimulate weight loss. Skipped insulin is a common cause of DK.A.

After tallcing to yom patient a little longer, she tells you that her previous doctor told her that if she didn't keep her diabetes under control, that she would go blind and

lose her kidneys. What are your thoughts on using fear tactics to motivate your patients?

Some health professionals and parents use guilt and fear to motivate teenagers. Patients are reprimanded for having numbers that are too high. They are told that this shows non-adherence to their meal plan or that they are not monitoring their blood glucose sufficiently. However, this strategy is flawed for multiple reasons. Firstly, guilt can place overwhelming and unnecessary stress on the adolescent's shoulders. What's more, adolescents feel even further isolated when receiving this guilt from people who they assumed were supposed to be supportive. As well, studies have shown that guilt is not an effective motivator, particularly with the adolescent population.

Instead, the health professional team and home supports should help the adolescent in developing self-awareness and positive hobbies. Something that gives them a sense of self. Anything from team sports to running, music, video games, writing, acting, etc. As well, the adolescent should have a strong network of people who they can reach out to for support when they are feeling lost– friends, family, or community programs. A self-aware adolescent will learn to check their blood glucose even when they are angry at their parents for reminding them to do so.

If your patient is not internally quite ready to take charge of their diabetes, you can offer an extrinsic motivator. With adolescents, a common extrinsic motivator is the privilege of driving.

With driving. there are several concerns to go over with the patient however. Driving is a dangerous activity for most adolescents. For adolescents with T1 DM, it is arguably even more so. Patients need to have good glycemic control and be cognizant of their highs and lows. The physician should assess whether the patient recognizes most of their lows. As well, some patients can confuse their highs with lows because of similar symptoms. If they've developed poor habits and do not check their blood glucose before correcting with insulin, there is the potential to exacerbate a problem. The key is to encourage the adolescent to be responsible with their diabetes management. Responsible management means that they are responsible enough for the privilege of driving.

At the end of the day, successful T1DM management does not mean tight glycemic control. Successful T1DM management is a plan that is connected to the patient's changing lifestyle and developing education needs. A plan that helps them keep their HbA1C within a target range and empowers them to take control of their situation and give them the emotional tools to manage in the long term.

<u>Your take home message for the day should be:</u>

1. Patients can either take multiple daily injections or manage their insulin with a pump. Multiple daily injections require multiple pokes but the pump requires a subcutaneous implant and is a little more expensive.
2. Provide education to your adolescent patient. Adolescents are going through the

messiness of being a teenager and simply need to be given the tools to succeed. Patients should be taught self-care strategies, be connected to supports within their family, friends, and multi-disciplinary diabetes team. They can also be bribed with an extrinsic motivator!

3. The ultimate goal for approaching an adolescent with TIDM is to help them feel supported and empower them to be the leaders in the management of their diabetes. No one has to cope with the stress of the diabetes more than the actual person who has it. So support them!

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