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### Update on Diabetic Gastroparesis

Each month Reach MD XM 160 presents a special series. This month is Focus on Diabetes. Listen each hour at this time as we explore with America's top medical thought leaders for latest information on diabetes.

If diabetic presents with abdominal pain, nausea, and vomiting. Could this patient have gastroparesis from the diabetes? How do we approach this and what treatments are available? Welcome to the Clinicians Roundtable, I am Dr. Lee Freedman, your host, and with me today is Dr. William Chey, Professor of Medicine, Director of GI Physiology in the Division of Gastroenterology at the University of Michigan Health System and member of The American Society for Gastrointestinal Endoscopy.

DR. LEE FREEDMAN:

Thank you for being with us Dr. Chey.

DR. WILLIAM CHEY:

Thanks so much Lee, it's my pleasure to be here with you.

DR. LEE FREEDMAN:

How often do we see diabetics with this problem of gastroparesis?

DR. WILLIAM CHEY:

It's a fairly common problem. It turns out that somewhere between 25% of the half of type 1 diabetics and around a third of type 2 diabetics will have evidence of delayed gastric emptying by careful testing.

DR. LEE FREEDMAN:

This is related all to the severity or duration of their diabetes or it's independent of that.

DR. WILLIAM CHEY:

There are some general associations between the duration of illness and the severity of the diabetes, but it's not a hard and fast rule, in other words, most commonly the people that are affected by diabetic gastroparesis are those individuals that have had poorly controlled long-standing disease, but I think all of us that had been doing this for a while and have occasional patients that have been under better control and have shorter duration of disease, but nonetheless still developed gastroparesis.

DR. LEE FREEDMAN:

So, it's certainly can't rule that out if somebody is relatively newly diagnosed diabetic and they present with the appropriate symptoms.

DR. WILLIAM CHEY:

No, absolutely not, and in fact I think the critical point, Lee, is that the distinction between symptoms versus gastroparesis. A lot of times I think that we are quick to assume that symptoms in diabetics equal gastroparesis, but it's important to draw that distinction between gastroparesis, which is a physiological diagnosis based upon an abnormal result from a gastric emptying study versus symptoms, which can be from gastroparesis, but similarly could be from any of the variety of other causes as well.

DR. LEE FREEDMAN:

So, how might diabetic with this problem present to us?

DR. WILLIAM CHEY:

Well, the most difficult symptoms that are associated with gastroparesis are things like postprandial fullness, early satiety, nausea, vomiting. Some patients with gastroparesis will also get upper abdominal discomfort or even pain, but you can see that those symptoms are fairly nonspecific and so in some cases they will represent gastroparesis, but in other cases when you do careful detailed evaluation with gastric emptying studies, for example, you won't necessarily find delayed gastric emptying, in fact, it's even been pointed out that in some diabetic patients with those types of symptoms will have accelerated gastric emptying.

DR. LEE FREEDMAN:

And so we do need to think about peptic processes and other functional bowel issues. Are there other important things to think of in the differential?

DR. WILLIAM CHEY:

Yeah, I mean I think you hit the nail right in the head. The differential for these types of upper GI symptoms is going to be the same as it would be in somebody that doesn't have diabetes. The difference is that the rank order of the differential would be a bit different in a diabetic. So, you are going to be more concerned about abnormalities and gastric physiology such as gastric emptying or another thing I

will draw into the argument is gastric accommodation in that abnormality or the reflux relaxation of the upper part of the stomach in response to eating a meal, which can be abnormal in patients with diabetes and for that matter can also be abnormal in patients with so called dyspepsia or upper GI symptoms of unclear etiology.

DR. LEE FREEDMAN:

So, the upper part of the stomach needs to relax in order to have the bolus go through and food go through and that can be impaired.

DR. WILLIAM CHEY:

Absolutely, in fact, stomach emptying is really a much more complicated process than we likely give it credit for, you know, just going through the things that need to happen for you to normally empty food from your stomach. Remember that in response to eating a meal, the upper portion of the stomach or the fundus should relax to allow you to continue to eat without generating tremendous amounts of pressure in response to eating food. In addition, the distal stomach or the antrum needs to grind up or triturate the food into very small particles, which then can pass through the pylorus and for that matter the pylorus needs to appropriately relax in response to that process of trituration or grinding to allow food to then move into the proximal small intestine where really digestion, processing, absorption occurs and remember the last portion of this whole equation, which again often times gets overlooked are all the **reflexes 4:57** that are present between the proximal small intestine and the stomach. Remember that's one of the main reasons why for example fatty foods empty more slowly than other constituents of a diet like protein.

DR. LEE FREEDMAN:

So, it's very complicated interaction of many parts of the GI tract and neurologic input. Are there particular aspects of this that tend to be more affected in diabetics?

DR. WILLIAM CHEY:

Yeah, I think it's an excellent question and the prevailing theory right now is that most diabetics will develop gastroparesis as a consequence of autonomic neuropathy and it's probably the reason that we tend to see this disorder more so in patients with other complications, which have been ascribed to autonomic neuropathy, things like retinopathy, things like peripheral neuropathy, like nephropathy. So, the common thread seems to be autonomic neuropathy.

DR. LEE FREEDMAN:

And then are there other characteristic abnormalities of this process that mark other types of either functional bowel diseases or other diseases?

DR. WILLIAM CHEY:

One thing I want to actually touch on at this point which I think is kind of interesting. The diabetologists are very, very familiar with this, but it's interesting that it's only now becoming more clear that this issue is important to gastroenterologists and that is this vicious cycle that many of these patients with diabetic gastroparesis get into because realize that delayed gastric emptying leads to unpredictable

delivery of nutrients to the small bowel and so in that way can lead to significant problems with diabetic control. Now why is that important from the standpoint of gastroparesis? Well, it's important because it turns out that hyperglycemia further delays gastric emptying. So, you can see how these patients get into this terrible situation where their glycemic control is a mess because their stomach emptying isn't right and that poor glycemic control then feeds into further aggravating the fundamental problem with gastric emptying. So, it's a tough issue that these patients deal with.

**DR. LEE FREEDMAN:**

My thinking about the diabetics will become brittle. I have never really thought about that mechanism playing a role, but very obviously it can.

**DR. WILLIAM CHEY:**

Yeah, and you know, the sort of proof putting on this particular point is that if you improve gastric emptying, it's been shown that you can improve glycemic control, in fact, diabetologists again, not uncommonly these days start to look at gastric emptying in patients that have very poor glycemic control and in fact improving gastric emptying, improving the reliability of delivery of nutrients to small bowel improves diabetic control in response to the insulin dosing and in turn improving glycemic control then makes it easier to treat the gastroparesis. So, again it's a vicious cycle, but if you can break the cycle, it actually often times has multiple benefits to the patient.

**DR. LEE FREEDMAN:**

When our patient presents to us, it sounds like we should make sure that we are not dealing with the peptic process or gallbladder process, appropriate history, exam, lab test. If we suspect gastroparesis, is gastric emptying study the way to go?

**DR. WILLIAM CHEY:**

It's surely the gold standard right now for the diagnosis of gastroparesis, but a lot of times you can get clues in just your standard workup of lot of these upper GI symptoms. So, for example, it's obviously not uncommon at all for an individual with these types of symptoms to undergo upper endoscopy and that in itself can be helpful on occasion, not all the time, but on occasion to help identify individuals with gastroparesis because remember that we ask patients to fast for probably up to 12 hours before they undergo an upper endoscopy examination. If you find evidence of retained food in the stomach at the time you perform an endoscopy after a 12-hour fast, that's relatively specific for the diagnosis of gastroparesis. Unfortunately, it's not very extensive, in other words, there are lot of patients that have gastroparesis that won't have evidence of retained food when you are doing upper endoscopy, but on occasions where you do identify that finding at the time of upper endoscopy, you can be pretty assured they have gastroparesis and probably don't even need to do a gastric emptying study at that point in such a patient. For patients where they have a negative endoscopy, you don't find a peptic process or some other structural abnormality to explain an individual symptom, you can certainly go on to performing gastric scintigraphy, that is, the nuclear medicine study, which typically involves the ingestion of technetium-labeled eggs or oatmeal and then sequential scans over a period of 2 to 4 hours to assess stomach emptying, and I do want to say one thing about gastric scintigraphy that I think is very important for listeners because in the community most gastric emptying studies are conducted over a period of 60 to 120 minutes, but there is very clear evidence now that show that the sensitivity and specificity of the study are significantly improved if you sample or scan over a 4-hour period of time. In fact, the gold standard that's held by The American Motility Society as well as the variety of other organizations, The American Gastroenterological Association, for example, suggests that we scan for a period of 4 hours. Certainly, a scanning period of less than 2 hours is really not that useful and should be discouraged in clinical practice.

DR. LEE FREEDMAN:

That's a very practical and important point. So, when we do order the gastric emptying study, we should make sure that scanning is continued for up to 4 hours.

DR. WILLIAM CHEY:

Agreed.

DR. LEE FREEDMAN:

And then if we make this diagnosis, how are we going to help these patients, what is our go through treatment or medication?

DR. WILLIAM CHEY:

You know, before we talk on medication, let's just say couple of things about diet because I think the important point for me as a gastroenterologist is often times we try to jump right to medications, but almost invariably patients will stop beginning to say, "but wait a minute, before you put me on medications, what about diet and lifestyle recommendations?" I will just talk through that very briefly. I think it's absolutely critical to recommend to the patients that suffer with gastroparesis to attempt a trial with smaller more frequent meals, so rather than 2 or 3 large meals like we tend to do in United States, a lot of times patients will significantly improve simply by having them smaller portions 4 to 5 times per day. Another thing is I think it's critically important to make sure the patients understand that fatty or greasy foods will delay gastric emptying and potentially worsen symptoms in patients that have gastroparesis or for that matter by the way patients that have acid reflux or dyspeptic symptoms in general will often times benefit by limiting the ingestion of fatty or greasy foods. I think another general thing particularly for patients with gastroparesis is avoiding carbonated beverages. These patients already have food in their stomachs that causes gastric distention and of course if you ingest carbonated beverages, which further distend your stomach, you could see how that might worsen symptoms in some of these patients. So, I think the dietary and lifestyle stuff is definitely worth talking about and one other thing I do want to mention is for people that have more severe or frequent symptoms something that you can go to that's a little bit more drastic, but can be of benefit at least in my experience is really to go to a mechanical soft diet or even a liquid diet. Most times the patients don't like this, but nonetheless they will feel better with this strategy at least at the times when they are more symptomatic.

DR. LEE FREEDMAN:

I want to thank Dr. William Chey who has been our guest as we have been discussing diabetic gastroparesis, the situations in which to suspect it, how to work it up, and then the treatment, both lifestyle and medication or pharmacologic.

I am Dr. Lee Freedman and you have been listening to The Clinicians Roundtable on ReachMD, The Channel for Medical Professionals. For comments and questions, send your email to [xm@reachmd.com](mailto:xm@reachmd.com). Thank you for listening.

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