Chronic Abdominal Pain Triggers: Is Personalized Assessment Feasible?

It's well-accepted that there are a variety of complex pathways that contribute to abdominal pain in children; but what are these pathways, and how can they be measured? By combining the data from mobile body sensors and self-reporting from participants, researchers at Children's Mercy Kansas City were able apply "big data" to identify pain triggers for each individual patient. The results were very encouraging.

Join Dr. Jennifer Schurman with the Division of Gastroenterology at Children's Mercy Kansas City as she introduces us to the importance of monitoring and collecting data on triggers for abdominal pain and the value that data holds for individualizing pain treatment in the clinic setting, real-time.

Featured Speaker:

Jennifer V. Schurman, PhD

Dr. Schurman is a child psychologist at Children's Mercy Kansas City, where she serves as co-director of the Abdominal Pain Program, Director of Gastroenterology Research and Gastroenterology Psychological Services and Programs. She received her PhD from the University of Cincinnati and completed an internship and fellowship at Children's Mercy Kansas City.

Learn more about Dr. Schurman (https://www.childrensmercy.org/profiles/jennifer-v-schurman)

Transcription:

Dr. Michael Smith, MD (Host): Our topic today is Chronic Abdominal Pain Triggers, Is Personalized Assessment Feasible? My guest is Dr. Jennifer Schurman. Dr. Schurman is a child psychologist at Children's Mercy Kansas City where she also serves as co-director of the abdominal pain program. Dr. Schurman, welcome to the show.

Dr. Jennifer V. Schurman, PhD, ABPP (Guest): Hi, it's a pleasure to be here.

Dr. Smith: So, how common is abdominal pain in kids?

Dr. Schurman: It's actually more common than people realize. There have been a lot of epidemiological studies just kind of to answer this question and the best estimate is around 20% of kids at any given time are having abdominal pain that interferes with some aspect of their life. So, and that is probably the most common in school-aged and adolescents.

Dr. Smith: Yeah and when – and how do these kids usually present? Are they usually going to their primary care physician or are they going into emergency rooms because of this?

Dr. Schurman: Well it really varies. The costs of this are pretty high both in terms of economics and also just social and emotional development. Some kids will just suffer in silence and with their pediatricians potentially treating them with just some reassurance and that this isn't dangerous, it's not going to kill

them, that they need to be going to school and doing all their normal things. So, sometimes pediatricians will be the frontline for this. Other times, the presentation is so acute, that parents can't help but think that something very serious is going on and may have repeat ER visits. It is very hard to manage in ER because there isn't anything obviously emergent going on and so trying to give some sort of assistance in the acute sort of short-term, is very challenging. Some kids will end up hospitalized for a lot of testing, some of which is necessary and some probably not. But the distress around this is so high because it's exquisitely painful and can really affect kids' ability to go to school and just do all of their normal things.

Dr. Smith: Right. And it really runs the gamut, right? We are talking about acute versus even chronic pain. We are talking about mild all the way to severe. A variety of causes. I'm just curious. How many kids go undiagnosed with the pain? Maybe you control it, it goes away, and we just don't really know what it was.

Dr. Schurman: It's an interesting question. I don't think we have great statistics on the kids who don't seek treatment. What we do know is that for kids who at least present in some fashion to pediatricians or to GI physicians; if you follow those kids out, most of those will continue to have pain into adulthood that may be sort of considered subclinical, but they still struggle with it to some degree. It doesn't really resolve on its own. So, we really need to be finding more active ways to treat kids so that this doesn't become a lifelong problem.

Dr. Smith: So, this kind of brings up the next question then about what – and it is what you guys at Children's Mercy have been researching, right, is what's the trigger for the pain itself. Why is that such an important question to ask and why are the triggers for pain such a challenge I guess to like identify and monitor?

Dr. Schurman: Yes, it is really what we focus on here at Children's Mercy and I think part of what has put this on our radar is that as far back as in the 1950s, they were using words like recurrent abdominal pain and it was kind of a catch all for all kids with any kind of GI pain, upper or lower, who didn't have a clear organic disease, something that was blood and pus and obviously easy to identify and over time, the effort has really been to categorize that group of kids. We knew that it was really heterogeneous, that kids presented with different kinds of symptoms, but that they also had different levels of severity and maybe responded to different treatments and so the goal at first, I think was really to just how can we classify kids by subgroups of symptoms, symptom types? And maybe do more research on what kinds of treatments would best be suited to those subgroups. So, the Rome criteria for functional GI disorders developed from that. We are currently in the fourth round, so Rome IV came out just a few years ago and I think what we have seen over time is that there hasn't been a lot of great traction in terms of understanding what treatments are effective for these different groups and in fact, each time the criteria come out, the criteria shift a little bit. Because what we are finding is even though we have got homogeneous groups of symptoms; there are still the kids within those groups are heterogeneous on a lot of other factors and so, treatment studies are still getting very mixed results.

And so, what we have really tried to do at Mercy, is to take a bigger sort of broader approach to that and say okay if diagnostic classification based on symptoms isn't going to drive forward our ability to treat kids and improve their lives; maybe we need to rethink how we classify them. We know that there is a broadly accepted biopsychosocial model for abdominal pain and that really includes biologic factors,

psychological factors, social factors; but the relative weight of any of those different factors is probably different for different kids. There is probably a reason that when we think about abdominal pain and we certainly see some kids with stress-related flares where they're experiencing more distress and so they subsequently have more pain. But that's not universal and it certainly is the case too that some kids with great amounts of stress have headaches instead of abdominal pain. So, trying to figure out how all the pieces fit together I think has made this a very complicated picture. A lot of kids can end up with the same outcome, but through very different pathways.

Dr. Smith: Yeah, so it does sound very complicated, right and just the fact that classifying them based on symptoms really didn't work when it came to treatment; just shows you how complicated all this is. So, I guess like where are we at then with this? I mean how are we identifying triggers? How are we monitoring these triggers and how does that lead to better treatment and outcomes?

Dr. Schurman: Absolutely. So, we have started a line of research in this area and I think our ultimate hope is that we could develop some sort of algorithm where you could feed in certain kinds of data and have the sort of program help to identify which are the primary treatment targets for a given child. But where we started with all of this was in a paper that we published in 2015 in Clinical Practice and Pediatric Psychology where we looked at sort of theoretical triggers. So, things that people kind of commonly believed maybe influenced abdominal pain. But instead of looking at these things sort of retrospectively, having kids self-report on things over the past month or looking at this more at the group-based level; what we tried to do is look at real time relationships between there were some psychological variables, dietary variables, social variables, sleep, allergen exposure, some of the things that we believed probably were related to abdominal pain in some way and then we did what was called ecological momentary assessment. So, we would basically kind of break into a child's real life, several times a day and just ask them a quick battery of questions about those specific things. So, what did they eat so far, what have they had to drink, what's their pain like right this second and again a whole host of different variables. We also collected allergen data from the roof of the hospital and fed that into the program. We looked at illness and things like that for kids as well. And what we did was we followed them over the course of a couple of weeks and then crunched that data so that we could look at were any of those triggers reliably associated with pain occurrence on the individual basis and across the group. And so, could we find basically any support for some of those theoretical triggers being evidence-based. And knowing that we would then need to consider those in treatment.

And we were able to find a number of different things in the different areas that were evidence-based; some stronger relationships across the groups than others. But the part that really has driven our research forward in addition to just being able to kind of narrow the pool of things to look at; is that when we looked at two different children on one particular variable and that was spicy food; it for the group ended up being sort of a minor trigger but when we looked at two specific kids; we found that it was a major trigger for one and not at all for the other. So, that's the risk when looking at group-based kind of analyses is that sometimes if you have this kind of heterogeneous population, when you take the average it doesn't really tell you anything or it isn't very accurate about what's actually going on within the group and what the individual treatment needs are going to be.

So, our second version of this project that we just finished, looked at the acceptability and feasibility of taking this really to the individual level. So, we did something similar in terms of following kids across a couple of weeks in their just what we call free living environment but just where they live and play and

go to school everyday and we would again, ask them specific questions via a handheld device and in our case, it was a loaner cell phone that would kind of ring them at the right time. They also wore an accelerometer and to track their physical activity and their sleep and then we would basically at the end of the two weeks have them send those devices to us. We would crunch the data within a week or two and then have a follow up visit with them where we could talk with them about the specific triggers for their pain intensity in the moment, as part of our clinical care.

And so, trying to figure out whether that was something that we could do reliably, how many times could we find individual triggers for a given child based on this amount of data and then kind of what was the parent and child reaction to that? How did it change our clinical practice? How acceptable was it to them? So, with the logistics and sort of the impact. And so, the nice thing with this work is that we found that our initial speculation that this is still a very heterogeneous group that has – that no two kids are probably exactly the same in terms of their triggers really was born out. We have collected now this data on 70 children and I have to say there isn't a single like duplicate profile in all of that. So, there are some commonalities but no duplicates.

Dr. Smith: Well let me – well Dr. Schurman, so this is a massive collection of data, teasing all that out at the individual level, obviously is a huge undertaking. How ultimately do you see this then translating to everyday practice?

Dr. Schurman: Yup, so, right now we are just using this information to kind of help kids to understand what's unique for them and to potentially motivate them to engage in certain aspects of treatment that they might not otherwise have been too keen to. So, if we find things like for them being afraid that they are going to have pain means that they actually do in fact have more pain, that stress and anxiety are a factor for them; then they may become more receptive to doing some of the treatments targeting that, whether that's cognitive behavioral therapy, or biofeedback assisted relaxation training. It certainly gives more weight to that recommendation and kids will understand it in a different way when you can personalize it like that. In the long run, our hope is that we are going to be able to develop ways of assessing for the variety of kind of relationships that we have seen more easily and be able to push that out to say even primary care where pediatricians as the frontline providers could actually collect a little bit of data, run it through the computer program, be able to identify the two or three key things for any given child whether those are medications or dietary or psychosocial and be able to get them on track earlier; because the longer that we wait, the greater the developmental and learning and social gaps for these kids. Our average time to get into our clinic has been two years just for them to find their way to us and that's two years of lost opportunity in a lot of ways. So, we would like to be able to support pushing this kind of individualized assessment and treatment out much closer to the onset.

Dr. Smith: And of course, it's – the personalized medicine, the personalized approach to anything we do is really where we are heading whether it's the genetics of it, whether it's understanding triggers like in abdominal pain, like this is obviously where I think all of medicine is kind of heading but of course it's as you say, it's complicated. It's figuring out all these different touch points, all these different potential triggers and how do you assess that in one individual. So, I think what fascinating work, but I do believe it's going to have the impact you think it will because the more I can personalize my approach to a patient, the diagnosis, the treatment, the outcome is simply going to be better and that's really what's key here.

I got to tell you, thank you so much Dr. Schurman for the work that you are doing at Children's Mercy; it's fascinating to me and I also want to thank you for coming on the show today. You're listening to Transformational Pediatrics with Children's Mercy Kansas City. For more information you can go to www.childrensmercy.org that's www.childrensmercy.org. I'm Dr. Mike Smith. thanks for listening.