HOT TOPICS IN IBD

Featuring:
Lauren Arpe
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[00:01] Maura Bowen: Hello and welcome to Abbott Nutrition Health Institute's POWER OF NUTRITION podcast. I'm Maura Bowen and I'm here today virtually with Lauren Arpe, a specialist Paediatric Dietitian from Great Ormond Street Hospital in London, and Hurjus Ryatt, a Paediatric Dietitian and Medical Nutrition Manager from Abbott in the United Kingdom.

[00:18] We're here to discuss some of the current hot topics in inflammatory bowel disease (or IBD). Now, inflammatory bowel diseases such as Crohn's disease and ulcerative colitis are increasing in paediatric populations around the world. They are long-term conditions characterised by symptoms such as diarrhoea and abdominal pain and may lead to poor growth in children and impact on quality of life.

[00:38] The exact cause of IBD is unknown, but there is ongoing research to find out more about these conditions and how different interventions, including nutrition, can help. Thank you both for joining us today! Hurjus, I'll hand this over to you so we can get started!

[00:53] Hurjus Ryatt: Thanks, Maura – it's a pleasure to be here, and thank you once again to Lauren for joining us today. Can you tell us a bit about yourself and your role at Great Ormond Street Hospital?

[01:02] Lauren Arpe: Thank you so much for having me. I'm a Paediatric Dietitian currently working at Great Ormond Street Hospital. I've been working in Gastroenterology for the last 11 years and at the moment I work very closely with the IBD team and I'm the mucosal immunology lead for the dietetic service at Great Ormond Street hospital.

[01:22] Hurjus Ryatt: Thank you, Lauren. I know you have a particular interest in the specialist area of IBD. What are some of the potential causes of IBD?

[01:30] Lauren Arpe: Yes, so as Maura was saying, IBD is a chronic, lifelong disease and involves inflammation of the gut, and can be divided into either Crohn's disease or ulcerative colitis. At the moment in the UK there are 725 cases diagnosed in 100,000 people. And, in a population-based cohort study in 2020, they actually found that the diagnosis incidence of adolescents has risen by 94%.

[01:59] So as far as the aetiology and causes of IBD, they are vastly unknown. A lot of people think there's some environmental causes and potentially some genetic causes, and the role of the microbiome in the pathogenesis of the disease. So, when looking at the microbiome, we are thinking of things like a sequence of events which involves changes in the microbiome which leads to intestinal permeability, bacterial adherence and the penetration of the epithelium which then stimulates the immune system and leads to tissue damage.

[02:33] We know that exclusive enteral nutrition in IBD has been used as a treatment for a very, very long time. And a lot of the researchers are now looking at how this affects the microbiome and how it modulates the gut microbiome and causes kind of remission from this severe inflammation. We also know that high fat diet and diets that are rich in emulsifiers can also negatively impact on the microbiome which could cause inflammation, and that having lots of fruits, vegetables and oily fish in our diets can be protective.

[03:06] Hurjus Ryatt: You mention the gut microbiome, which is a real hot topic and has an important role in the developing immune system. What is the latest evidence to indicate that the gut microbiota may play a role in causing IBD?

[03:19] Lauren Arpe: As I mentioned earlier, the microbiome is established in early childhood, if not infancy. And recent studies have characterised how host genetics, prenatal environment, delivery mode and diet can all play a role in modulating the gut microbiome in infants.

[03:35] Breast milk is considered to have a protective effect in IBD and this could be for many reasons. But one of the thoughts at the moment is the human oligosaccharides that are in the breast milk in abundance and is thought to aid gut maturation and prevent adherence of pathogenic bacteria and also to help with immune modulations. So that could be something that is protective. And, we also know that in IBD there is known to have a dysbiosis, especially in Crohn's disease we have high amounts of proteobacteria, strains such as E-coli, whereas in healthy adults we have more kind of species such as Firmicutes or Bacteroidetes.

[04:19] Another bit of research has been in mice, susceptible mice. Mice susceptible to inflammation don't get colitis if they are in a germ-free environment, whereas if they are transferred, so some proinflammatory bacteria then they do develop colitis. So, all of these thoughts are looking at how the microbiome could cause inflammation and diseases such as IBD.

[04:43] Hurjus Ryatt: So, with that in mind, can the gut microbiome be manipulated in any way to treat IBD? For instance, can prebiotics or probiotics help?

[04:53] Lauren Arpe: Unfortunately, there is limited high quality studies on the effects of probiotics. However, saying that we do have quite a bit of evidence that probiotics can be used in ulcerative colitis, specifically pouchitis. It is important to use the kind of right strains, we are looking at lactobacillus or the bifidobacterial species and are thought to increase the mucosal regulatory T-lymphocytes and decrease the mucosal expression of mRNA of pro inflammatory cytokines.

[05:22] Unfortunately we don't have as much evidence in Crohn's disease, and it could just be we need a bit more of an individualised approach, how we can use the right combinations of probiotics in our kind of studies. Have they been used for the right length of time? And you know, is it that we introduce them a bit too late when the pathogenic microbiota have established themselves in the guts?

[05:45] As far as prebiotics, well that is the food for probiotics and for the microbiome and we get them from things like fruit, veggies, oats and wholegrains, and they are not digested in the upper GI tract and they reach the colon intact and are selected to be fermented to make short chain fatty acids and lactates. And, we know

they can positively shift the microbiome in the gut which is great. I think there have been people who said that probiotics are visitors in the guts and not particularly residents. And prebiotics is something that can really influence this and kind of get us to have a good amount of healthy bacteria.

[06:27] The problem is I think, is actual studies and our actual evidence behind this. Most of the kind of prebiotics that have been used in the studies, things like inulins and oligosaccharides, so FOS and GOS, and human oligosaccharides which is found in abundance in breast milk. But unfortunately, few prospective controlled trials exist. It's likely that we need to find the right combination and need to know more of the bacteria, specific bacteria involved in inflammation to be able to target the prebiotics that could help. It's also likely that different probiotics would be needed whether its Crohn's or ulcerative colitis.

[07:07] Hurjus Ryatt: What about fermented foods such as sauerkraut or kefir? How could that impact the gut microbiome?

[07:16] Lauren Arpe: Well, fermented foods can be very beneficial for health in certain disease conditions and the thought behind that is that they contain probiotics so they could add as competition for the pathogenic bacteria. So if we are looking at kefir specifically, it's a fermented milk drink, and you add a starter culture to the milk which is called kefir grains and they consist of lactose fermenting yeasts, non-lactose fermenting yeasts, lactic acid or acetic acid producing bacteria and they produce a nice range of healthy strains such as lactobacillus brevis. And, so you know it's something that we definitely would want to look more into especially for IBD. There was a study where IBD patients were given kefir strain milk to kind of drink, 45 IBD patients, and they found after four weeks of having 800 mls of kefir milk they had really good amounts of lactobacillus in their stool which is a good sign.

[08:18] And then there was also a really interesting study of patients who had been diagnosed with H pylori. They were on eradication treatments, antibiotics for two weeks. Half of the people were given kefir, so 500 mls to drink a day, and the other half were given 250 mls of milk. The group of people that had kefir actually eradicated H pylori 78% more effectively than the other groups. I think it's quite promising there, but it needs a bit more study, especially in IBD related studies.

[08:53] And, then we look at the sauerkraut. So, sauerkraut, which is a common preserved cabbage, and that contains a really nice amount of strains of Bifidobacterium, Lactobacillus and I mean the culture does depend on what type of starter culture that is used to actually make the sauerkraut. And that is one of the only fermented foods that has a double-blind, randomised controlled trial and that was with IBS patients. So, 58 of them were given either 75 g of pasteurised or non-pasteurised sauerkraut and both actually had improvements of their IBS severe symptoms scoring which is really interesting, but strangely enough no changes in microbiome, so we are no closer to using as a form of treatment. But I think as part of everyone's healthy diet it could definitely be something to include to give you that good variety of microbiome in your guts.

[09:49] Hurjus Ryatt: That is really interesting Lauren. So, studies have consistently demonstrated the positive effects of fibre on gastrointestinal health. Does fibre have a role in managing IBD, and if so, what could be considered the optimal fibre blend?

[10:05] Lauren Arpe: Fibre is you know, known to have many benefits such as digestion, absorption, transit time, stool formation and then microbial effects. So, I think it's really important to include it in patients with IBD's diet. There are some concerns with stricturing patients so they tend to be advised to have a lower fibre diet, but I think wherever possible medically to have fibre in the diet is important. There was a study done by Day et al in April 2021, and it was actually looking at fibre intakes in IBD. What they did was to look at five data bases with 2105 publications and 26 of these met the inclusion criteria. What they actually found was two thirds of the IBD patients don't meet the recommended amounts of fibre that you should have in your diet. And, actually four studies found only 10-21% of IBD patients met these recommendations. So, it shows it is definitely an area we have to kind of look more into. As far as the types of fibres, historically we used to always say is it soluble verses insoluble.

[11:14] There was another interesting paper published this year where it was talking about maybe we need to define fibres by functional characteristics, so things like solubility, viscosity and whether they are fermentable in the gut, so whether they can make the short chain fatty acids in the stool. I think when you are looking at an optimal blend, I think in most people and in IBD patients allowed to have, a good combination of these because they all have their own benefits and reasons for being in the diet. So, you know increasing these kind of plant sources in the diet is really, really helpful.

[11:50] Hurjus Ryatt: So, some patients with IBS or irritable bowel syndrome are recommended to implement a low FODMAP diet to treat their symptoms. Could this be used to help patients with IBD and what effect could that have on a patient's gut microbiome?

[12:04] Lauren Arpe: Unfortunately, the low FODMAP diet has not been found effective in reducing inflammation in IBD. But there is some evidence to be using it in patients who are in remission for their IBD but still having IBS-like symptoms. In 2019, Cox et al did a single blind trial with patients where 52 of them were either randomised to have low FODMAP diet and then the other group had a control diet. The low FODMAP diet definitely found gut symptom relief which was really good. The downside was they actually found they had lower forms of the good bacteria, so things like Bifidobacterium, Faecalibacterium had actually much lower quantities in patients who have been on the low FODMAP diet and also had no kind of changes in either group with any kind of, the inflammation markers.

[12:58] So, I think low FODMAP is really helpful with patients who have IBS like symptoms, but it's just a matter of being aware that you should probably trial introductions because you don't have to avoid all of the low FODMAP diet, so be guided by dietitians to put these foods back in is really important and there is kind of potential in looking at whether using a supplement with a probiotic at the same time to keep your good bacteria levels.

[13:25] Hurjus Ryatt: And finally, are there any other diets or nutritional approaches that could be considered helpful for these patients?

[13:35] Lauren Arpe: Well, we have exclusive enteral nutrition so that is the long standing, really effective treatment, it reduces inflammation and often gets patients into remission with mucosal healing. So the remission rates are between 60 to 80%. Unless we use, basically the patient drinks a polymeric fibre-free

drink feed for eight weeks and have minimal, kind of, you know maybe some water and boiled sweets alongside it. And, they are found to kind of move into remission on this diet which is really good.

[14:06] A lot of the new dietary treatments are looking at how they can emulate what exclusive enteral nutrition has done. So, we've got the Glasgow colleagues who are currently investigating CD Treat, which is a diet based on exclusive enteral nutrition, and what exclusive enteral nutrition, what effects it has on the gut microbiome and inflammation. And it basically recreates the EN by excluding the dietary components such as gluten and lactose. So they have done a pilot study, so Solvos et al had four children who followed this CD Treat and had special meals designed for them for eight weeks. 80% of them clinically responded, so had a reduction in inflammation. And, 60% of them actually went into remission and at the moment they are doing a bigger trial and seeing if they can replicate those results.

[14:58] We also have the Israeli diet which is a Crohn's disease exclusion diet and that was formulated with a whole bacterial penetration cycle. They are looking at and saying Crohn's disease is caused by bacterial adherence and this is their theory, and which leads to increased intestinal permeability and stimulates an immune response which leads to tissue damage. So, they are thinking how they could change the diet to avoid this sequence of events happening. As to what they have done, patients have to have, a good proportion of their diet has to be partial enteral nutrition and they have to have five mandatory foods in their diet every single day. And these were decided upon because, whether they produce specific substrates for production of short chain fatty acids. They also use then use lean proteins to reduce the amount of proteobacteria and improve permeability and avoiding things like animal fats, milk fats, wheat, red meat and foods that are high in taurine as well as emulsifiers. So their randomised controlled trial found 78 patients through, either randomised to exclusive enteral nutrition or the CDED. It was found that they had similar remission rates at six weeks to exclusive enteral nutrition, but they found actually that their diet was better tolerated, and patients found it easier to be able to eat a little bit as well as have supplements at the same time.

[16:25] So we know that partial enteral nutrition alone does not get people into remission and so the focus is definitely on what foods they were avoiding at the same time as having partial enteral nutrition. I think it's definitely a good starting point first to look at diet as a treatment and whether we act to avoid all those foods that these patients have been or whether we can kind of target it a little bit more to kind of affect the microbiome.

[16:52] Hurjus Ryatt: Thank you, Lauren, it's been fascinating to hear your insight into IBD and the gut microbiome. I've really enjoyed talking to you today. I'll now hand back over to Maura to close our discussion.

[17:04] Lauren Arpe: Thank you so much for having me, it's been lovely to be here.

[17:07] Maura Bowen: Thank you both again for joining us today and for providing your expert insights on IBD. This was such a great conversation.

[17:15] Listeners, if you found this topic of interest and would like to hear more from experts on a wide range of topics, please visit ANHI.org/uk. Abbott Nutrition Health Institute's POWER OF NUTRITION podcast is also on Spotify and we have more than 40 episodes to choose from, be sure to subscribe today and share us with your colleagues. Thanks for listening!

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