NHD
NETWORK HEALTH DIGEST

eArticle with CPD

SPONSORED BY
Yakult

Volume 6.21 - December 15th 2016

Kate Roberts
Registered Dietitian

Kate is a Freelance Dietitian with a wide range of clinical experience of working with adults and children from previously working in the NHS, her specialities are Diabetes and Allergies.

OVERVIEW OF PROBIOTICS AND THEIR IMPACT ON HEALTH AND NUTRITION

Probiotics are certainly on-trend right now; you can't open a health magazine or look at the news without seeing the benefits of a healthy microbiome (previously known as gut flora). In this article we're going to look a little about the history and sources of probiotics and review what solid research there is available on the subject.

'Probiotic' is a term which literally means 'for life' and the Food and Agriculture Organisation of the United Nations (FAO) and World Health Organisation (WHO) adopted the definition in 2002 of 'live microorganisms, which when consumed in adequate amounts, confer a health effect on the host'.[1] It was Eli Metchnikoff in 1907 who originally documented that there can be a benefit to a host caused by certain bacteria.[2] Henry Tissier was also carrying out work in 1906 which suggested that administering selected bacteria could help children with diarrhoea improve their gut microbiome.[2]

More recently, over the last 30 years, there has been a huge amount of research in the area. There are new discoveries on how gut microbiota affects the body every day. Recent articles have reported that it can help prevent dementia, MS, migraines and obesity. All of which is tremendously exciting; however, as registered healthcare professionals, we can only advise patients on what we currently have solid evidence for. For example, it is understood that probiotics do interact with our immune systems, but, unfortunately, there is no strong evidence at present to recommend any particular strains of probiotics to patients.

EXAMPLES OF EVIDENCE FOR HEALTH EFFECTS OF PROBIOTICS

Improved tolerance to lactose

Lactose digestion can be improved by consuming yoghurt, starter cultures and probiotics found in fermented and unfermented milk.[3] Key strains identified were: *L. acidophilus; bifidobacteria, Lactobacillus bulgaricus* and *Streptococcus thermophilus*. This is due to the fermented milk product containing the enzyme β-galatosidase, slower gastrointestinal transit, colonic microflora, lower symptom sensitivity and improved intestinal function.[3] Probiotic bacteria was less effective; however, but it was found to potentially alleviate the symptoms caused by poor digestion of lactose.[3]

Obesity and Metabolic syndrome

A small but well-designed study[4] has shown that daily intake of fermented milk reduced abdominal adiposity, waist and hip circumference and BMI. This suggests that probiotics can help to reduce cardiovascular risk, as well as other metabolic disorders. Another small study[5] has shown that daily probiotics can preserve insulin sensitivity in male patients with or without Type 2 diabetes mellitis.

Allergies

It has been shown in high quality studies that probiotics, specifically strains of Lactobacilli and bifidobacteria, along with prebiotic galacto-oligosaccharides, can prevent and aid treatment of atopic eczema in certain high risk children.[6,7] Also, a systematic review and meta-analysis has shown that probiotics given prenatally and postnatally can reduce the risk of developing food hypersensitivity.[8]

Cancer

It appears that probiotics may aid in prevention of certain cancers. Milk fermented with Lactobacillus casei has been found to have a prophylactic effect against the return of bladder cancer[9] and another study[10] showed that two strains of probiotics plus oligofructose seemed to stimulate the systemic immune system to reduce biomarkers for risk of colon cancer.

Diarrhoea

There is a great deal of evidence to support the use of probiotics in preventing and treating diarrhoea in adults and children. Please refer to the following Cochrane reviews[11,12] and http://cdrf.org/home/checkoff-investments/usprobiotics/probiotics-basics/

Irritable bowel syndrome (IBS)

The debate continues as to how effective probiotics are on IBS. The British Dietetic Association recommendation was for probiotics to be considered as a second line approach. However, the 2016 revised guideline[13] warns that probiotic formulations may contain ingredients that exacerbate IBS symptoms. They recommend that patients can try probiotics, but if there is no improvement after four weeks to stop them. There has been a recent review, however, that found a positive link between probiotics and constipation dominant IBS.[14]

Inflammatory bowel disease (IBD)

Unfortunately, there has been no strong evidence to support probiotics in the treatment of Crohn's disease. However, there is evidence to show that probiotics can aid remission in patients with Ulcerative Colitis[15] and a daily high dose of probiotics has been shown to cause remission of pouchitis,[16] this was associated with an increase in Quality of Life indicators.

Necrotizing enterocolitis

A Cochrane Review in 2014[17] shows that there is strong evidence to show that enteral supplementation of probiotics prevents severe necrotizing enterocolitis and death in pre-term infants.

MAIN SOURCES OF PROBIOTICS

People mostly think of fermented milk products such as Actimel and Yakult when it comes to probiotics. However, there is a huge availability of different products including many that are dairy free, and it is also possible to make probiotic products at home. There are supplements available from health food shops and chemists. Another common source is live yoghurt which can contain two to four strains of bacteria depending on the make; this can be a very economical way of introducing probiotics into the diet if you shop around and look at labels on supermarket own-brands. Another dairy source is kefir which is made by introducing kefir granules to milk and produces a slightly sour drink which can be flavoured. You can also get chocolate which is supplemented with probiotics.

Non-dairy sources include: sauerkraut, kimchi, lacto-fermented vegetables such as dill pickles, Kombucha tea, live ginger beer, unfiltered craft beer from a micro-brewery, water kefir, miso and Tempeh. With all these things, it is important to check that they are still live and a lot of them can be made at home. Dill pickles and sauerkraut are surprisingly easy to make. Foods such as sourdough bread, canned sauerkraut, pickles in a jar and aged cheese will have contained live microorganisms initially, but they do not tend to survive processing, baking or storing.

PREBIOTICS

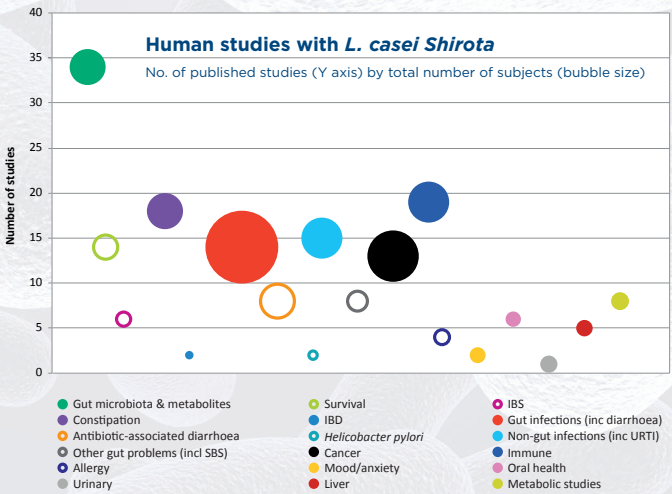
Prebiotics act as food for the beneficial components of our *existing* gut microbiota. They are essential in improving the gut microbiota. Prebiotics are indigestible carbohydrates and include: Galactooligosaccharides (GOS); Fructooligosaccharides (FOS), Oligofructose (OF), Chicory fibre and inulin. They can be found naturally in some vegetables. Breastmilk also contains oligosaccharides; this is now being reproduced in infant formula. There are also many foods that have them added and a variety of supplements available.[18]

Lactobacillus casei Shirota and your patients

Find the science at **yakult.co.uk/hcp**

Did you know: Over 100 peer-reviewed publications describe human studies with *Lactobacillus casei* Shirota, Yakult's unique strain that is scientifically proven to reach the gut alive. Research areas include:

- **Fundamental aspects,** e.g. gut survival, safety, mechanism of activity (e.g. immune function)
- **Gut disorders,** e.g. constipation, IBS, IBD
- **Infections,** e.g. *Clostridium difficile*-associated diarrhoea (and antibiotic-associated diarrhoea), norovirus, nosocomial, upper respiratory tract
- **Emerging areas,** e.g. cancer, metabolic diseases and liver disease



Yakult is a science based company, dedicated to scientific education and research. Our expert science team is on hand to help healthcare professionals make evidence based decisions for their patients.

Contact us at **science@yakult.co.uk** or on **020 8842 7600** for:

- Free educational talks in your place of work on the gut and probiotic research
- Free educational literature

sci health©

RECOMMENDATIONS FOR PRACTICE

- It is very difficult to advise on doses and there are no current UK guidelines unlike the US and Canada (www.usprobioticguide.com; www.probioticchart.ca). Each strain varies in how many million have been found to be effective and what they are beneficial for.
- Make patients aware that increasing their intakes of prebiotics and probiotics may cause some side effects such as bloating or discomfort; it is, therefore, advisable to make small changes and build up intake slowly as the gut microbiota adjusts.
- Encourage patients to increase their intake of prebiotics to support any probiotics that they are consuming.

CONCLUSION

In some areas, as above, it has been proven that probiotics can have a positive impact to health and nutrition, although strong evidence for prebiotics and probiotics can be difficult to find for general improvements to health. As healthcare professionals, it is important to assess each patient individually and, as long as there is no indication that probiotics would cause harm (such as if your patient was immunosuppressed), improving their microbiome can be encouraged.

Useful links

www.isappscience.org/probiotics/
www.cdrf.org/home/checkoff-investments/usprobiotics/probiotics-basics/
www.bda.uk.com/foodfacts/probiotics.pdf
www.worldgastroenterology.org/guidelines/global-guidelines/probiotics-and-prebiotics/probiotics-and-prebiotics-english

References

1 Report of a Joint FAO/WHO Working Group on Drafting Guidelines for the Evaluation of Probiotics in Food; Ontario, Canada. 30 April, 1 May 2002
2 Joint FAO/WHO Expert Consultation on Evaluation of Health and Nutritional Properties of Probiotics in Food including Powder Milk with Live Lactic Acid Bacteria, Argentina, 1-4 October 2001
3 de Vrese M, Stegelmann A, Richter B et al (2001). Probiotics-compensation for lactase insufficiency. Am J Clin Nutr 2001; 73 (2 Suppl): 421S-429S
4 Kadooka Y1, Sato M, Imaizumi K, Ogawa A, Ikuyama K, Akai Y, Okano M, Kagoshima M, Tsuchida T. Regulation of abdominal adiposity by probiotics (Lactobacillus gasseri SBT2055) in adults with obese tendencies in a randomized controlled trial. Eur J Clin Nutr. 2010 Jun; 64 (6): 636-43. doi: 10.1038/ejcn.2010.19. Epub 2010 Mar 10
5 Andreasen AS1, Larsen N, Pedersen-Skovsgaard T, Berg RM, Møller K, Svendsen KD, Jakobsen M, Pedersen BK. Effects of Lactobacillus acidophilus NCFM on insulin sensitivity and the systemic inflammatory response in human subjects. Br J Nutr. 2010 Dec; 104 (12): 1831-8. doi: 10.1017/S0007114510002874. Epub 2010 Sep 6
6 Kalliomäki, M, Salminen S, Arvilommi H, Kero P, Koskinen P, Isolauri E. Probiotics in primary prevention of atopic disease: a randomised placebo-controlled trial. Lancet. 2001 Apr 7;357(9262):1076-9
7 Kukkonen K1, Savilahti E, Haahtela T, Juntunen-Backman K, Korpela R, Poussa T, Tuure T, Kuitunen M. Probiotics and prebiotic galacto-oligosaccharides in the prevention of allergic diseases: a randomised, double-blind, placebo-controlled trial. J Allergy Clin Immunol. 2007 Jan; 119 (1): 192-8. Epub 2006 Oct 23
8 Guo-Qiang Zhang, Hua-Jian Hu, Chuan-Yang Liu, Qiao Zhang, Shristi Shakya, and Zhong-Yue Li. Probiotics for Prevention of Atopy and Food Hypersensitivity in Early Childhood. A PRISMA-Compliant Systematic Review and Meta-Analysis of Randomised Controlled Trials. Medicine (Baltimore). 2016 Feb; 95(8): e2562. Published online 2016 Mar 3. doi: 10.1097/MD.0000000000002562
9 Aso Y, Akaza H, Kotake T, Tsukamoto T, Imai K, Naito S. Preventive effect of a Lactobacillus casei preparation on the recurrence of superficial bladder cancer in a double-blind trial. The BLP Study Group. Eur Urol. 1995; 27 (2): 104-9
10 Roller M, Clune Y, Collins K, Rechkemmer G, Watzl B. Consumption of prebiotic inulin enriched with oligofructose in combination with the probiotics Lactobacillus rhamnosus and Bifidobacterium lactis has minor effects on selected immune parameters in polypectomised and colon cancer patients. Br J Nutr. 2007 Apr; 97 (4): 676-84
11 Allen SJ, Okoko B, Martinez E, Gregorio G, Dans LF. Probiotics for treating infectious diarrhoea. Cochrane Database Syst Rev. 2004; (2): CD003048
12 Goldenberg JZ, Lytvyn L, Steurich J, Parkin P, Mahant S, Johnston BC. Probiotics for the prevention of pediatric antibiotic-associated diarrhoea. Cochrane Database Syst Rev. 2015 Dec 22; (12): CD004827. doi: 10.1002/14651858.CD004827.pub4
13 Y. A. McKenzie, R. K. Bowyer, H. Leach, P. Gulia, J. Horobin, N. A. O'Sullivan, C. Pettitt, L. B. Reeves, L. Seamark, M. Williams, J. Thompson, M. C. E. Lomer, (IBS Dietetic Guideline Review Group on behalf of Gastroenterology Specialist Group of the British Dietetic Association) British Dietetic Association systematic review and evidence-based practice guidelines for the dietary management of irritable bowel syndrome in adults (2016 update) J Hum Nutr Diet. 2016 Oct; 29 (5): 549-75. doi: 10.1111/jhn.12385. Epub 2016 Jun 8
14 Mezzasalma V, Manfrini E, Ferri E, Sandionigi A, La Ferla B, Schiano I, Michelotti A, Nobile V, Labra M, Di Gennaro P. A Randomised, Double-Blind, Placebo-Controlled Trial: The Efficacy of Multispecies Probiotic Supplementation in Alleviating Symptoms of Irritable Bowel Syndrome Associated with Constipation. Biomed Res Int. 2016; 2016: 4740907. doi: 10.1155/2016/4740907. Epub 2016 Aug 9
15 Currò D, Ianiro G, Pecere S, Bibbò S, Cammarota G. Probiotics, fibre and herbal medicinal products for functional and inflammatory bowel disorders. Br J Pharmacol. 2016 Oct 3. doi: 10.1111/bph.13632. [Epub ahead of print]
16 Mimura T, Rizzello F, Helwig U, Poggioli G, Schreiber S, Talbot IC, Nicholls RJ, Gionchetti P, Campieri M, Kamm MA. Once daily high dose probiotic therapy (VSL#3) for maintaining remission in recurrent or refractory pouchitis. Gut. 2004 Jan; 53 (1): 108-14
17 AlFaleh K, Anabrees J. Probiotics for prevention of necrotizing enterocolitis in preterm infants. Cochrane Database Syst Rev. 2014 Apr 10; (4): CD005496. doi: 10.1002/14651858.CD005496.pub4.
18 International Scientific Association for Probiotics And Prebiotics (2016), http://isappscience.org/prebiotics

NETWORK HEALTH DIGEST

eArticle with CPD

Volume 6.21 - December 15th 2016

Questions relating to: *Overview of probiotics and their impact on health and nutrition* Type your answers below, download and save or print for your records, or print and complete by hand.	
Q.1	Explain the difference between prebiotics and probiotics.
A	
Q.2	What impact has recent research into probiotics had on current advice that can be given to patients?
A	
Q.3	How can probiotics improve tolerance to lactose?
A	
Q.4	Outline the current UK recommendations on probiotics and irritable bowel syndrome.
A	
Q.5	What are the main dairy sources of probiotics?
A	
Q.6	Provide examples of non-dairy sources.
A	
Q.7	Give two recommendations on probiotics for practice regarding patient support.
A	
Please type additional notes here . . .	