



# PROBIOTICS AND GUT HEALTH

In his review of current research on the use of probiotics, Dr Mayur R. Joshi looks at the clinical landscape concerning probiotic use and gut health.

The last few decades have seen the search for alternative therapies increase immeasurably as the general and scientific population look for more natural treatments for many diseases, with fewer side effects and clinical implications. Unsurprisingly the research behind probiotics, the human microbiome and the relationship we have with the microbes inhabiting the human body has mirrored this increase, with a vast amount of financial and scientific support

in the area. Probiotics have been defined as “live microorganisms that, when administered in adequate amounts, confer a health benefit on the host”<sup>1</sup>. This definition is generally accepted for now, but as more research is carried out looking at the mechanisms of action, their effects on metabolic pathways and even their effects on brain development and mental health, the bridge between natural supplements and pharmaceutical drugs

is ever shortening. The term pharmabiotic is becoming more commonplace and displays an understanding that microbes have significant therapeutic potential and indeed are more commonly seen in clinical environments nowadays.

## Current clinical landscape

Research is being carried out in a number of areas, such as allergy, autoimmune disease & mental health, reflecting the

profound impact that our microbiota can have on the body. However, the traditional association between probiotics and health has been in relation to gut disorders. This is, after all, where bacteria can be found in their highest concentrations and this is where the majority of research is still focused at the moment.

### Focus on gut Health

One of the main difficulties is that research on one probiotic product is not applicable to another, as different species can interact with one another and indeed different strains of the same species can have different properties. Nonetheless, there is increasing evidence for the efficacy of probiotics in a number of conditions.

## Irritable Bowel Syndrome (IBS)

IBS is an area of considerable research; with up to 25% of the population affected by IBS type symptoms it is also an area of great potential. Changes in the bacterial population of the gut in IBS patients are well documented<sup>2</sup> and two review papers have identified the beneficial effects of probiotics. Between the two reviews, 61 randomised controlled trials were examined with the overall conclusion that probiotics are beneficial in the management of IBS<sup>3,4</sup>. Some reviews, reiterated the point that not all probiotics are beneficial and plenty of clinical trials were excluded for inadequate or biased designs. The focus of future research will no doubt be based upon more stringent trial designs looking at specific IBS subtypes.

## Inflammatory Bowel Disease (IBD)

Initial research into the use of probiotics in IBD was highly promising but overall the outcomes have been less satisfactory than first anticipated, particularly in Crohn’s disease<sup>5</sup>. There are a number of reasons for this; current research is focused on alternative treatment paradigms, with traditional strategies used in combination with probiotic formulations. With a multifactorial aetiology it is likely that IBD will need a more individually tailored treatment approach than once thought, looking at specific probiotic agents to treat specific microbial targets at specific doses for the individual<sup>5</sup>. This type of complexity once again reflects the intricacy of the

human microbiome and the variations seen within individuals. Despite the heterogeneity between IBD sufferers there is sufficient evidence to suggest that probiotics can have a significant impact in the management of IBD in the future.

## Infectious diarrhoea

Infectious diarrhoea is the worldwide leading cause of morbidity and mortality; with even minor infections contributing to malnutrition and a significant health burden (Sanders 2013). A better understanding of the mechanisms involved has led to the use of beneficial microbes as a management strategy. There is a significant body of work that has shown that probiotics can reduce the risk, severity and duration of infectious diarrhoea episodes and they are already in widespread use worldwide<sup>6</sup>.

## Types of probiotics and considerations when choosing

There are a number of different formulations available on the market, ranging from yoghurt-based products to clinical grade capsules or sachets. Each has their merits, but in general there are a number of practical advantages to using capsule or sachet-based products. The storage requirements are usually different, with refrigeration required for yoghurt products to avoid deterioration, which also impacts on convenience of use when travelling, for example.

In addition, yoghurt-based products have added flavourings and tend to have a high sugar content; a well-known probiotic yoghurt drink has more sugar in it, by volume, than Coca Cola, an important consideration in diabetic patients.

It is thought that different strains of probiotic bacteria work together to exert a greater effect than a single strain, resulting in much improved clinical outcomes when using a multi-strain formulation<sup>7</sup>. Yoghurt based-products tend to only contain a single strain due to problems with stability in multi-strain preparations.

It is also important to look out for the dosing information. Certain products will guarantee doses at the time of manufacture, which means that by the time the product is taken the dose

cannot be ascertained. Some products do guarantee the dose for the full shelf life.

## Summary

Probiotic and microbiome research is growing and the next few years should see at least one, probably more, products gaining European health claim or medicinal licence status, representing a big leap forward in the industry. There is established data relating to gut health, but the potential for probiotics is almost limitless and other, more niche products will become available as understanding of the complexities of our relationship with microbes improves.



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