

Probiotics can reduce occurrence of diarrhoea

Probiotics can shorten the duration of diarrhoea by half-a-day

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Probiotics when consumed regularly may be able to prevent many acute diarrhoea cases in children. In 2010, diarrhoea killed more than 210,000 children aged less than five years in India, *The Lancet* reported recently. The mortality figures were nearly 19,000 in neonates and 193,000 in children aged 1-59 months.

The Food and Agriculture Organisation (FAO) and World Health Organisation (WHO) describe probiotics as "microorganisms that exhibit beneficial health effects for hosts when a sufficient amount of them are ingested."

Masanobu Nanno, Associate Director of Yakult Central Institute for Microbiology Research, Yakult Honsha Co Ltd, Tokyo, told a group of journalists that a clinical trial using the company's probiotic drink — *Lactobacillus casei* strain Shirota (LcS) — in an urban slum community in Kolkata showed promise.

The clinical trial, funded by the company, was conducted by the Kolkata-based National Institute of Cholera and Enteric Diseases. "The funding agency had no role in the design, data collection, data analysis, data interpretation or writing the report," the paper noted.

The trial was community-based, randomised, double-blind and placebo-controlled involving 3,758 children aged 1-5 years from ward 66 in Kolkata Municipal Corporation.

While 608 subjects in the study group consumed the company's probiotic drink every day for 12 weeks, the control group (674 children) received a placebo. The children were followed up for a further 12 weeks.

The proof

At the end of the 24-week study period, the group that received the probiotic drink showed reduced occurrence of acute diarrhoea. "The level of protective efficacy for the probiotic group was 14 per cent," stated the paper pub-



UNDER CHECK: The digestive tract has some 400 different types of bacteria that keep the harmful bacteria under check. — PHOTO: SANDEEP SAXENA

lished in the journal *Epidemiology and Infection*.

But the authors warn that there is insufficient evidence for "extrapolation of these results for global recommendation."

Besides good sanitation and safe drinking water, probiotics may probably have a role in preventing many deaths caused by diarrhoea.

The 25 to 35-foot-long gastrointestinal tract of an adult human has about 100 trillion bacteria — good, neutral and pathogenic microorganisms. This is approximately ten times the total number of cells in the human body. In all, the digestive tract has some 400 different types of bacteria that keep the harmful bacteria under check.

The intestinal epithelium by itself acts as a physical barrier to the pathogenic bacteria. However, when the number of good bacteria declines, pathogenic microorganisms can destroy the integrity of the intestinal wall and cause many illnesses, diarrhoea included.

The rationale of the study was therefore to populate the digestive tract with good bacteria using the drink rich in

Lactobacilli casei strain Shirota.

Incidence reduced

"It is reasonably well established that probiotics can shorten the duration of diarrhoea by half-a-day," said Dr. B.S. Ramakrishna, Professor and Head of Gastroenterology, CMC, Vellore. "In a community the incidence of regular diarrhoea can come down by 15 per cent." Similar benefits have been seen in other two types of diarrhoea as well — travellers' diarrhoea and antibiotic-induced diarrhoea.

"Probiotics has shown some beneficial effects in the case of travellers' diarrhoea," Dr. Ramakrishna said. "There is clear evidence of prevention and shortening of duration by half-a-day in the case of antibiotic-induced diarrhoea."

More evidences

The effectiveness of probiotics in preventing and even reducing the duration of diarrhoea has been reported in several studies.

For instance, a 2006 meta-analysis found probiotics as "safe and effective for both

treatment and prevention of acute paediatric diarrhoea." The study was published in the *International Journal of Probiotics and Prebiotics*.

A 2002 study published in the *European Journal of Clinical Nutrition* found *Lactobacilli casei* to "significantly reduce the duration of diarrhoea in children." The study was carried out on 75 subjects at the Delhi University College Hospital and another 75 in a resettlement colony in East Delhi.

"Probiotics are generally beneficial in treatment and prevention of gastrointestinal diseases," noted a 2012 *PLoS ONE* paper.

It went on to state that "the type of disease and probiotic species (strain) are the most important factors to take into consideration" when choosing to use probiotics for treatment or prevention of gastrointestinal disease.

(This Correspondent was a member of a group of journalists who visited Tokyo to attend the "Spring 2012 Japan tour for journalists from overseas" at the invitation of Yakult Honsha Co Ltd, Tokyo)

Is curd a probiotic?

According to a 2002 study published in the *European Journal of Clinical Nutrition*, the amount and strain of useful bacteria in curd vary from place to place. The number of different *Lactobacillus* bacteria isolated from curd preparations in India is as high as 250 species. But can curd and yoghurt be technically called as probiotics?

Dr. Neerja Hajela, who is the Head- Science at Yakult Danone India Pvt. Ltd, in an email to R. Prasad, dwelt in detail on the contentious issue.

Can curd and yoghurt be called as probiotics?

No. Curd and yoghurt cannot be called as true probiotics.

What is the reason for this?

According to the 2001 definition of probiotics by FAO/WHO, it is important that for any strain/product to be classified as a probiotic it must be or must contain live microorganisms (generally numbering one billion) which are resistant to gastric acid, bile and pancreatic juices and reach the target site (small intestine/large intestine) in numbers sufficient enough to elicit a beneficial effect. It should be scientifically validated through well controlled clinical trials.

Curd is defined as a product obtained by souring boiled or pasteurized milk naturally, by harmless lactic acid bacteria or other bacterial cultures. It may contain a wide variety of bacteria, which are not defined qualitatively/quantitatively. The number and type of bacteria also vary from home to home.

Yoghurt, on the other hand, is obtained by lactic acid fermentation of milk by

Lactobacillus delbrueckii subspecies *bulgaricus* and *Streptococcus thermophilus*, which are not true probiotics as per the definition.

While one cannot underestimate the nutritional benefits that these products bestow, it still remains to be determined whether these products contain organisms that are defined in terms of number, viability at the target site and whether scientifically validated for health benefits (all these criteria as per the universally accepted probiotic definition). Hence, products that are standardised in terms of the strain of bacteria, viable count and scientifically proven health benefits are different from these natural products.

A 2002 study published in the *European Journal of Clinical Nutrition* which had also used Indian dahi found it to be effective in significantly reducing the duration of diarrhoea. Your comments.

I am not so sure of the study design, but the probiotic (Actimel) was more effective in terms of reducing the duration of diarrhoea (0.6 days versus 0.3 days) as compared with curd. The curd used in the study was a standardised preparation with defined viable count.

Should a product contain a certain number and specific beneficial bacterial species to be called a probiotic?

Yes, it is important that a food item/product contains a specific number of beneficial bacteria for it to be called a probiotic.

The benefits are strain specific, and therefore vary from strain to strain.

Which are the *Lactobacilli*

species present in curd and yoghurt?

Curd may contain a wide variety of bacteria like *Lactobacillus acidophilus*, *Lactococcus lactis*, *Lactococcus lactis cremoris* etc, whereas yoghurt contains *Streptococcus thermophilus* and *Lactobacillus bulgaricus*.

Can the number of bacteria present in curd and yoghurt be increased through natural fermentation?

Yes, the number of bacteria can be increased by natural fermentation. However, prolonged fermentation tends to render the product very sour because of excess amount of acetic/lactic acid that is produced during the process. Moreover, the exact bacterial count cannot be determined in a process that has not been standardised.

It has been a traditional practice to provide buttermilk to children suffering from diarrhoea. If it is not a probiotic, is buttermilk just keeping the children hydrated?

Curd and buttermilk, apart from being a part of our diet, are also taken by people who are lactose intolerant — cannot digest lactose since they lack the enzymes that are needed to break down lactose, the milk sugar.

In fermented products like curd and buttermilk, most of the lactose is converted to lactic acid/acetic acid by the enzymes that are found in fermenting bacteria. Hence these products are easier to digest.

The role of buttermilk in treating diarrhoea has not been scientifically proven. But it is given during diarrhoea to rehydrate, and hence it imparts some benefit.

Minor planet named after Chinese scientist

A minor planet that was discovered by Chinese astronomers, has been named after a well-known late Chinese scientist and educator Yan Jici, the Chinese Academy of Sciences (CAS).

The minor planet, known as No 10611, was discovered by the Beijing Schmidt CCD Asteroid Program under the

entist, was the honorary chairman of the Central Committee of the Jiu San Society and vice-chairman of the Sixth and Seventh National People's Congress Standing Committee.

He was also one of the initiators of University of Science and Technology of China, one of China's top uni-

4,000-year-old tomb found

Archaeologists have discovered a 4,000-year-old tomb in Egypt that contains a sarcophagus inscribed with ancient funeral texts as well as ritual objects. The tomb dates from ancient Egypt's First Intermediate period (2181-2055 B.C.). Very little archaeological evidence survives from this period.

Ritual objects made from