

Can probiotics survive under medication treatments?

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Generally, when one consumes probiotics regularly, either in the forms of functional foods such as yoghurt or milk, or in dosage forms such as capsules, probiotics usually adhere to the epithelial wall of the colon and provide health benefits to the host. Health benefits include prevention or treatment of infectious diseases, irritable bowel syndrome, allergies, lactose intolerance, colon cancer and reduction of serum cholesterol levels. In normal practice, probiotics should be taken regularly (daily) in order to replace old probiotics which have colonized in the colon. In times of illness, various medications may be needed in order to alleviate the symptoms, etc.

Can probiotics survive all the medication treatments during the course of illness?

Medication treatment seems to be a condition one frequently encounters. Botes *et al* have carried out a study on other aspects of probiotics and the susceptibility to antibiotics, anti-inflammatory drugs and analgesics. Seven strains of probiotics and potential probiotics used in the study were *Enterococcus mundtii* ST4SA, *Lactobacillus plantarum* 423, *Lactobacillus salivarius* 241, *Enterococcus faecalis* T8, *Lactobacillus johnsonii* La1, *Lactobacillus casei* Shirota, and *Lactobacillus rhamnosus* GG. The susceptibility was studied, using the disc diffusion method. Probiotics were imbedded into agar medium in petri dishes. Each medication, at a known concentration, was spotted onto the surface of the agar. The plates were later examined for the inhibition zones; the wider the clear zone, the more susceptibility of the probiotics to the medications. Since this study is an *in vitro* study (tested in a petri dish), the result will only reflect what might be expected when one takes any of

these medications. The real situation in the body may be different.

1. Antibiotics group.

The medications in this group include Ciprofloxacin (100 mg/ml), Amoxicillin (100 mg/ml), Cefadroxil (50 mg/ml), Roxithromycin (30 mg/ml), Doxycycline (20 mg/ml), and Norfloxacin (80 mg/ml). Among the antibiotics tested, Norfloxacin (the medication which is normally used for gastrointestinal infections) showed the lowest inhibitory activity. Norfloxacin showed the inhibitory activity against 2 strains of probiotics, *L. salivarius* 241 and *E. faecalis* T8 only, but did not inhibit the other 5 strains. All of the 7 strains were susceptible to the rest of the antibiotics, except for *L. plantarum* 423 which could resist Ciprofloxacin.

In conclusion, when one needs to be on antibiotics treatment, it is likely that your probiotics which have colonized in the colon will be wiped out. So by the end of the treatment period, one will probably need to start all over again, supplying more probiotics in order to build up the army of probiotics in your colon.

2. Anti-inflammatory group.

The medication in this group include Metamizole + codeine + terpin hydrate (100 mg/ml), Meloxicam (1.5 mg/ml), Ibuprofen (40 mg/ml), Diclofenac potassium (5 mg/ml), Sodium hydrogen carbonate (100 mg/ml), Prednisolone (3 mg/ml), Piroxicam (4 mg/ml), and Aspirin (60 mg/ml). None of the strains were inhibited by Sodium hydrogen carbonate and Metamizole + codeine + terpin hydrate. Aspirin, also an analgesic, inhibited only *E. mundtii* ST4SA. Prednisolone, a steroid drug, inhibited 2 strains of probiotics, *L. casei* Shirota and *L. rhamnosus* GG whereas Piroxicam inhibited *E. mundtii* ST4SA and *L. salivarius* 241. Ibuprofen inhibited 4-5 strains of probiotics except for *L. salivarius* 241 and *L. johnsonii* La1. The anti-inflammatory drugs which inhibited all the probiotics strains were Meloxicam and Diclofenac potassium.

In conclusion, although the susceptibility of the probiotic strains to anti-inflammatory drugs are lower than to those in the

antibiotics group (i.e. smaller inhibition zones in the anti-inflammatory group); the duration of treatment of the anti-inflammatory drugs might be longer. Some of the probiotic strains may survive after a short-term treatment but in the case of long-term treatments, one may have to consider re-boosting the probiotics populations.

3. Analgesics group.

The medications in this group include Paracetamol (100 mg/ml) and a combination of Paracetamol + Codeine phosphate + Promethazine HCl + Alcohol. Paracetamol did not inhibit any of the probiotic strains. The combination drug inhibited all of the strains except for *L. johnsonii* La1.

In conclusion, in order to maintain the probiotic populations in the colon, one might be better of using only the single drug, Paracetamol, rather than the combination one, to treat pain and fever. Thus, no re-boosting will be needed later on.

Reference

1. Botes M, van Reenen C, Dicks LMT. Evaluation of *Enterococcus mundtii* ST4SA and *Lactobacillus plantarum* 423 as probiotics by using a gastro-intestinal model with infant milk formulations as substrate. Inter J Food Microbiol 2008; 128:362-70.
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