

## A five patient's case study on the influence of two different probiotics on individual intestinal microbiota

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### **ABSTRACT**

**Background:** The composition and activities of indigenous intestinal microbiota are of paramount importance to human immunity, nutrition, and pathological processes, and hence, the health of the individual. It is well established that the intestine is an important site for local immunity. It is known that the effect of probiotics increases beneficial microbiota and improves chronic conditions such as atopic diseases, irritable bowel disease, and obesity. However, as there are so many probiotics, it is unknown which probiotics might have more of an impact upon intestinal microbiota.

**Objective:** To understand how two different types of probiotics influence human intestinal microbiota, we analyzed human fecal microbiota after taking each of the probiotics.

**Methods:** Five outpatients from Yoko Clinic (1 male and 4 females; aged between 34–46 years old) were enrolled in this study. None of the subjects had cancer or any active inflammatory diseases. The five patients took *Lactobacillus buchneri* (SU) for 4 weeks, no probiotics the following week, and mixed probiotics (NS) which are *Lactobacillus plantarum* (NS-5), *Lactobacillus rhamnosus* (NS-11), *Lactobacillus delbruekii* (NS-12), *Lactobacillus helveticus* (NS-8), *Lactobacillus fermentum* (NS-9) for the following 4 weeks. Fecal samples were collected before and after the outpatients took each of the two probiotics, and were then analyzed using a kit from Techno Suruga Laboratory Co., Ltd. The analysis of the microbiota was performed by targeting bacterial 16S rRNA genes with a terminal restriction fragment length polymorphism analysis program (Nagashima method).

**Results:** Three patients of the five patients decreased the percentage of beneficial bacteria

(*Lactobacillales*, *Bifidobacteria*) after taking SU ( $13.7 \pm 7.1\%$  to  $4.0 \pm 3.5\%$ ), whereas the remaining two patients showed an increased percentage of beneficial bacteria ( $16.8 \pm 3.4\%$  to  $30.4 \pm 4.6\%$ ). After taking NS, the three patients who decreased the percentage of beneficial bacteria after taking SU increased their beneficial bacteria ( $4.0 \pm 3.5\%$  to  $8.0 \pm 2.1\%$ ), whereas the two patients who increased beneficial bacteria after taking SU showed a decreased percentage of beneficial bacteria ( $30.4 \pm 4.6\%$  to  $16.4 \pm 7.4\%$ ).

**Conclusion:** This study demonstrated that the two probiotics had different influences. Probiotics should be selected not only for their quality but also for compatibility with each intestinal bacterial flora.

**Key words:** probiotics, intestine, microbiota