



Lacidophilin be a Possible Medicine to Cure Gout

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Abstract

Gout is a prevalent disease that causes extreme pain to the patient, it is mainly led by hyperuricemia. Traditional idea to treat gout is to take less purine and use some drugs; however, purine is also important nutritional material in the human body and the drugs have side-effects that can't be ignored. It should be dysfunction of uric acid decomposition or excretion that causes hyperuricemia, not purine intake. Lactobacillus has important functions in inhibiting uric acid biosynthesis during purine metabolism and gut microbiota with allantoinase gene could convert uric acid into urea. In mice experiment Lactobacillus is predominant genus in gut microbiota of healthy mice, while the mice with antibiotic-associated diarrhea have significant decrease in abundance of it, and Lacidophilin has good effect to recover its abundance same to be healthy level; therefore, it possibly is a better medicine for curing gout.

Keywords: Gout, Uric acid, Gut microbiota, Lactobacillus, Lacidophilin

Gout is a highly prevalent disease that causes extreme pain and disables one's moving ability. When the uric acid in the blood is high and the urate deposited in the joint, it leads to arthritis which is called gout. A prevalent idea to treat gout is to consume less food that contains purine; however, purine also has important functions in human body,¹ DNA consists of thymine, uracil, adenine, guanine, and the last two are purines, therefore it is not a good treatment in long term to restrict purine intake. In fact, it is hyperuricemia that makes gout possible to happen, and uric acid is just a byproduct during purine metabolism, it is better to treat gout by curing the dysfunction of the process to reduce uric acid in the blood, helping the body to decompose or excrete uric acid.

The uric acid in human body is excreted by kidney and decomposed by gut microbiota, latest research shows² that gout is always related to abnormality of gut microbiota. The gout group have enriched Phascolarctobacterium and Bacteroid, which can promote urate to be converted into allantoin, and there is a deficiency of microbiota with the allantoinase gene in the gout group, this may lead to the dysfunction of uric acid decomposition. Also, the microbiota of gout group has abundant xanthine dehydrogenase gene, these abnormalities may increase uric acid.

There are many probiotics that is beneficial to reduce uric acid, Lactobacillus could break inosine and guanosine to inhibit uric acid synthesis, Lactobacillus gallinii could reduce purine levels in the gut, its fermentation product has urate-lowering effect, Lactobacillus gasseri can reduce purine absorption to gut, short chain fatty acids propionate and butyrate which are products of gut microbiota fermentation, can also promote uric acid excretion by providing ATP to the gut, gut microbiota is like an important organ that significantly influences human body. It should be dysfunction of uric acid decomposition or excretion that leads to hyperuricemia which leads to gout, and hyperuricemia may be caused by an unhealthy gut microbiota. Hyperuricemia might also induce gut microbiota to translocate into other tissues like kidney, and impair the intestine barrier, these may deteriorate the hyperuricemia because two-third of uric acid is excreted by kidney. One-third of uric acid is decomposed by gut microbiota and the other is excreted by the kidney; however, traditional drug treatment has too much side-effect that can't be ignored, it should be possible that to recover the health of one's microbiota would cure the gout from its root.

There are a lot of prebiotics effective to improve health condition of the gut microbiota and is beneficial to alleviate gout,

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such as insulin, β -carotin, and green tea powder etc., among them Lacidophilin is noticeable. Common abnormality of gut microbiota is caused by the antibiotics, there are remarkable changes of gut microbiota in antibiotic-associated diarrhea. The experiment on mice showed that the genus *Lactobacillus* is predominant genus in healthy gut microbiome, the mice with antibiotic-associated diarrhea has remarkable decrease in the abundance of *Lactobacillus* genus while other genera *Bacteroides*, *Parabacteroides*, and *Parasutterella* have marked increases instead, as figure 3 in the reference 3 showed. *Lactobacillus* has important functions of reducing uric acid in purine metabolism, its species can inhibit uric acid biosynthesis during the purine metabolism, while *Bacteroides* promotes the urate conversion into allantoin, and the deficiency of allantoinase gene and abundance of xanthine dehydrogenase gene in the microbiota may cause hyperuricemia; therefore, such marked abnormality of gut microbiota will make high risk of gout, the *Phascolarctobacterium* and *Bacteroides* are core microbiota of gout, the author hasn't get studies about *Lactobacillus* changes in gout group and healthy group, but there should be study to observe this, *Lactobacillus* probably plays an important role in the uric acid decomposition of gut microbiota and its production in gut may also have important functions to other parts of the body, such as the kidney, the dysfunction of uric acid decomposition or excretion should be the true culprit that causes gout, not purine, any nutritional material must be moderate, at least about the moderate level in the human body to keep one's health. The experiment on mice also shows Lacidophilin has the most significant effects on

restoring the *Lactobacillus* abundance in the gut microbiota from antibiotic-associated diarrhea,³ only Lacidophilin can recover the *Lactobacillaceae* abundance at family level; therefore, Lacidophilin possibly is a crucial medicine to recover the health of gut microbiome and cure gout caused thereby.

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Conflicts of Interest

Regarding the publication of this article, the author declares that he has no conflict of interest.

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