

Targeting Gut Bacteria May Help Burn and Trauma Patients



A new study published in *PLOS ONE* shows that burn injuries could trigger dramatic changes in the 100 trillion bacteria inside the gastrointestinal tract. Researchers found a huge increase in Enterobacteriaceae, a family of potentially harmful bacteria, in patients who had suffered severe burns. There was a corresponding decrease in beneficial bacteria that normally keep harmful bacteria in check.

The findings indicate that burn patients might benefit from treatment with probiotics (live beneficial bacteria), according to researchers from Loyola University Chicago Health Sciences Division. The findings also might apply to other trauma patients, including patients who have suffered traumatic brain injuries, said senior author Mashkoor Choudhry, PhD.

In healthy individuals, the gastrointestinal tract contains more than 100 trillion bacteria, called the microbiome, that live symbiotically and provide numerous benefits. When this balance is disturbed, a state called dysbiosis occurs. Dysbiosis has been linked to many conditions, including inflammatory bowel disease, diabetes, rheumatoid arthritis and obesity.

For this study, Dr. Choudhry and colleagues examined faecal samples from four severely burned patients who were treated in the Burn Center of Loyola University Medical Center. The samples were taken 5 to 17 days after the burn injuries occurred. The researchers then compared the microbiomes of these patients with the microbiomes of a control group of eight patients who had suffered only minor burns.

The results showed that Enterobacteriaceae accounted for an average of 31.9 percent of bacteria in the gut microbiomes of the severely burned patients. In contrast, Enterobacteriaceae accounted for only 0.5 percent of the microbiome in patients who had suffered minor burns. Enterobacteriaceae is a family of bacteria that includes pathological bacteria such as *E. coli* and *Salmonella*.

Such imbalances of bacteria may contribute to sepsis or other infectious complications that cause 75 percent of all deaths in patients with severe burns, Dr. Choudhry pointed out. The imbalance could compromise the walls of the gastrointestinal tract, enabling harmful bacteria to leak out of the gut and into the bloodstream. Dr. Choudhry is planning further studies to confirm this hypothesis.

Further research is also needed to determine whether administration of probiotics could restore a healthy microbiome and reduce the risk of sepsis and other infectious complications.

Dr. Choudhry is a professor in the Burn & Shock Trauma Research Institute, Department of Surgery and Department of Microbiology and Immunology of Loyola University Chicago Health Sciences Division.

Source: [Loyola University Health System](#)

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