

## Fungal dysbiosis in cirrhtic patients due to the use of antimicrobials. Risk or benefit?

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There is a significantly marked fungal dysbiosis in cirrhotic patients, which changes differentially with the use of antibiotics and proton pump inhibitors, although it is known that patients with cirrhosis have a fairly weakened immune system, therefore, these have a greater risk of developing bacterial infections, the use in this type of patients of drugs such as proton pump inhibitors and antimicrobials, represents an even greater risk of developing, no longer bacterial infections, but of fungal origin [1].

Although, the above should not be seen as an even worse problem, since various studies, among which an investigation carried out during 90 days in 26 healthy control patients and 143 patients with cirrhosis, of which 47 presented an infection treated with antibiotic therapy. The analysis made revealed that bacterial and fungal diversities were significantly related and that this association decreased markedly in case of infection. On the other hand, these dysbiosis were accentuated as the clinical state worsened until reaching terminal liver failure. This showed that fungi represent an important point in intestinal dysbiosis, being able to be used as a predictive marker for the risk of hospitalization in cirrhotic patients and even as therapeutic measures [2].

However, on the other hand, a study concluded that intestinal fungi can contribute to the development of alcoholic liver disease, scientists from the University of California who carried out this research, used a mouse model and human samples of serum and

stool obtained from healthy patients and patients with liver diseases, through this study they were able to observe that patients with alcohol dependence showed a reduction in the diversity of intestinal fungi and an excessive growth of candida. However, on the other hand, a study concluded that intestinal fungi can contribute to the development of alcoholic liver disease, scientists from the University of California who carried out this research, used a mouse model and human samples of serum and stool obtained from healthy patients and patients with liver diseases, through this study they were able to observe that patients with alcohol dependence showed a reduction in the diversity of intestinal fungi and an excessive growth of candida [3].

As in cirrhosis, the intestinal microbiota is involved in the course of other liver pathologies, in fact, numerous investigations have indicated that the intestinal microbiota and Toll-like receptors promote the development of hepatocarcinoma [4]. In the literature, the pathophysiological process is attributed to the fact that lipopolysaccharides and the molecular patterns associated with the pathogen, products of intestinal bacteria, activate TLR4, thus triggering signals that stimulate the Nuclear Factor KB cascade, which results in greater epiregulin secretion, increasing with it pro-inflammatory cytokines and inflammatory molecules such as tumor necrosis factor, thus initiating the development of hepatocarcinoma [5].

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It is for this reason that various authors have suggested the use of antibiotics, since these could prevent the development of hepatocarcinomas in patients with liver disease [5]. To conclude, I would advise carrying out more research in order to know the background of intestinal dysbiosis both at the level of bacteria and fungi, since as we can see on the one hand the use of antimicrobials would affect the microbiota and could trigger disorders but on the other hand, its use would be related to reducing the development of hepatocarcinomas, it is at this point that we would have to assess whether the risk is less than the benefit or we are facing a Trojan horse that has a more significant impact on patients cirrhotic.

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