



The First Scientific Conference on Health and Medical Research in the UAE-5-6 December 2022

The associated risk of *Blastocystis* infection in colorectal cancer: a case-control study

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Background: *Blastocystis* is an anaerobic intestinal protozoan. Nine *Blastocystis* subtypes (STs) were detected in humans. A subtype-dependent association between *Blastocystis* and colorectal cancer (CRC) has been debated in many studies. Thus, this study aims to assess the possible association between *Blastocystis* infection and CRC condition compared to cancer outside the gastrointestinal tract (COGT) and cancer-free control (CF). We also checked for the presence of gut fungi and their association with *Blastocystis* spp. and cancer.

Methods: We used a case-control design; cancer patients and CF participants. The cancer group was further sub-grouped into CRC group and COGT group. Macroscopic and microscopic examinations were performed to identify intestinal parasites in participants' stool samples. Molecular and phylogenetic analyses were conducted to identify and subtype *Blastocystis*. Furthermore, gut fungi were investigated molecularly.

Results: 104 stool samples were collected and matched between CF (n=52) and cancer patients (n=52); CRC (n=15) and COGT (n=37). *Blastocystis* prevalence was significantly higher among CRC patients (60%, P=0.002) and insignificant in COGT patients (32.4%, P=0.161) compared to CF group (17.3%). *Blastocystis* infection between the two cancer groups was statistically insignificant (P=0.209). The most common subtypes were ST2 among cancer group and ST3 in the CF group.

Conclusion: CRC patients have a higher risk of *Blastocystis* infection compared to cancer-free individuals (OR= 5.66, P=0.009). Nevertheless, further studies are required to understand the underlying mechanisms of *Blastocystis* and CRC association.


Keywords: *Blastocystis spp.*, Colorectal Cancer, ST Subtypes, Phylogenetic Analysis, UAE.

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DOI of Abstract:

Title of the paper	DOI
The associated risk of <i>Blastocystis</i> infection in colorectal cancer: a case-control study	DOI: 10.3389/fonc.2023.1115835