

## Effect of Radiotherapy/Chemotherapy Protocol on the Gut Microbiome in Pediatric Cancer Patients

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**Abstract :** The gut microbiome plays important roles in the human body that includes but not limited to digestion, immunity, homeostasis and response to some drugs such as chemotherapy and immunotherapy. Its role has also been linked to radiotherapy and associated gastrointestinal injuries, where the microbial dysbiosis could be the driving force for dose determination or the complete suspension of the treatment protocol. Linking the gut microbiota alterations to different cancer treatment protocols is not easy especially in humans. However, enormous effort was exerted to understand this complex relationship. In the current study, we described the gut microbiota dysbiosis in pediatric sarcoma patients, in the pelvic region, with regards to radiotherapy and antibiotics. Fecal samples were collected as a source of microbial DNA for which the gene encoding for V3-V5 regions of 16S rRNA was sequenced. Two of the three patients under study had experienced an increase in alpha diversity post exposure to 50.4 Gy. Although phylum Firmicutes overall relative abundance has generally decreased, six of its taxa increased in all patients. Our results may indicate the possibility of radiosensitivity or enrichment of the antibiotic resistance of the elevated taxa. Further studies are needed to describe the extent of radiosensitivity with regards to antibiotic resistance.

**Keywords :** combined radiotherapy and chemotherapy, gut microbiome, pediatric cancer, radiosensitivity

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