

Scientists find link between antibiotics and colon cancer

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Scientists from the University of Aberdeen, NHS Grampian and Queen's University Belfast have found that antibiotic use may increase the risk of developing colon cancer, potentially more so among younger people.

The study of almost 40,000 people compared [antibiotic use](#) and lifestyle factors of those who had colorectal [cancer](#) and those who didn't. While no relationship was found with rectal cancer, antibiotic use was found to be associated with the development of colon cancer.

The researchers also found for the first time that, while the overall numbers remain relatively low, antibiotic use was linked with an estimated 50 percent higher [risk](#) of colon cancer in people aged under 50, and an estimated 9 percent higher risk in those 50 and over.

Sarah Perrott, from the University of Aberdeen and co-first author of the research explains: "Antibiotic use is very common, and it is important to note that not everyone who uses [antibiotics](#) will get bowel cancer.

"However, while invaluable in medicine, antibiotics should be used appropriately and only when necessary."

Published in the *British Journal of Cancer*, the Cancer Research UK funded study, analyzed data from the Primary Care Clinical Informatics Unit Research (PCCIUR) national primary care database. From this routinely gathered data, the team identified 7,903 people with colorectal cancer and compared them to more than 30,418 matched people without a cancer diagnosis. The researchers controlled for genetic factors and non-[genetic factors](#) such as underlying [health conditions](#), to try to determine whether antibiotic use is a risk factor for colon cancer. To understand the effects of other risk factors, they then adjusted for alcohol consumption, smoking and weight.

Early-onset and later-onset colon cancer were investigated separately as the evidence suggests that risk factors may differ between early-onset and later-onset disease.

Previously, only a small number of studies investigating an antibiotic and colon cancer link existed and these studies were limited to older adults and showed mixed results.

Sarah Perrott adds: "We found antibiotic exposure was associated with colon cancer among all age groups.

"This, along with multiple other dietary and lifestyle factors, may be contributing to increased cases of colon cancer among young people."

Reasons behind this link are purported to be due to the impact of antibiotics on the natural diversity of bacteria within the gut microbiome, which can potentially lead to altered bacterial activity and interfere with normal immune function. This can lead to chronic inflammation and theoretically increase the risk of cancer.

Sarah Perrott adds: "Taking antibiotics is likely to have a detrimental impact on the [gut microbiota](#). Antibiotics can unintentionally induce gut dysbiosis, which may lead to permanent changes to the natural gut environment. This disruption to the gut microbiome may be what drives this increase in risk.

"It is important to note that diet, lifestyle, stress, and so many different factors can affect gut health and antibiotic use is just one of those factors."

The team suggest that prescribing of antibiotics should be considered very carefully: "Regardless of our findings, antibiotic prescribing should be judicious due the pressing concern of antimicrobial resistance.

"Healthcare professionals and members of the public need to be aware that unnecessary antibiotic use, especially among young people, should be avoided." Miss Perrott adds.

They also suggest that [probiotic supplements](#) could be useful to counteract the negative effects of antibiotics: "Probiotic supplements contain strains of live microbes and aim to improve or restore the gut microbiome. Although there is limited evidence so far, perhaps pairing an antibiotic with a probiotic drug could limit the incidence of gut microbiome dysbiosis, given that antibiotic exposure is often necessary and unavoidable."

Dr. Ron McDowell, Centre for Public Health, Queen's University said: "This study shows the value of using the high-quality data being routinely collected by our health service to inform clinical practice. Further studies are required to evaluate the long-term effects of antibiotics on gut health."

Senior author Dr. Leslie Samuel, Consultant GI Oncologist in NHS Grampian said: "We are seeing more cases where people under 50 are being diagnosed with colorectal cancer—a disease traditionally seen in older people. Many do not have factors we might expect to see, such as diabetes, obesity, high alcohol intake and sedentary lifestyle.

"The [gut microbiome](#) comprises a delicate balance of bacteria and disruption to that—be it from [lifestyle factors](#) or from repeated use of antibiotics as we have seen here, can have very serious consequences."

Alice Davies, health information manager at Cancer Research UK, said: "The results of this study build on previous research examining a link between antibiotic use and [colon cancer](#).

"Currently there isn't enough evidence to say if antibiotics are definitely increasing people's risk, but this gives us another piece of the puzzle. Continued research is needed, we still need to understand which antibiotics might increase the risk, how this happens, and how much they increase risk by.

"Antibiotics are an essential tool in combatting common illnesses so it's important to follow your doctor's advice on taking them."

Co-author Professor Peter Murchie, a GP and professor of primary care at the University of Aberdeen added: "Against a background of rising antibiotic resistance these data come as a timely reminder to GPs and their patients that taking antibiotics can have consequences, some of which may be yet to emerge. Their use should be reserved for clinical situations where they are truly necessary."

More information: Ronald McDowell et al, Oral antibiotic use and early-onset colorectal cancer: findings from a case-control study using a national clinical database, *British Journal of Cancer* (2021). [DOI: 10.1038/s41416-021-01665-7](https://doi.org/10.1038/s41416-021-01665-7)

Provided by University of Aberdeen

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