

Is Cellphone Carrying Below the Waist (Exposure to Non-Ionizing Radiation) Contributing to the Rapid Rise in Early-Onset Colorectal Cancer?

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Abstract

BACKGROUND AND AIM: The incidence of early-onset (EO) (< 50 years of age) colorectal cancer (CRC) has been rising rapidly in recent decades, suggesting the presence of a new environmental risk factor. One emerging, yet under-investigated factor is increased exposure to radiofrequency (RF) non-ionizing radiation from widespread cellphone use. The young population has been documented to carry their cellphones in pants' pockets many hours a day, leading to extensive exposure to RF radiation in the colorectal region. Intestinal epithelial cells are among the tissue cells most sensitive to radiation exposure. The study was designed to investigate whether cellphone carrying below the waist is associated with increased risk of EOCRC.

METHOD: We conducted a case-control study among 50 recently diagnosed EOCRC cases and 50 randomly selected age- and sex-matched controls. Information on carrying habits included specific locations below the waist before EOCRC diagnosis, the average amount of time carried per day and the ages at which they started and stopped carrying at a given location. **RESULTS:** After controlling for confounders, a longer duration (the highest tertile) in total hours of carrying a cellphone below the waist had more than 4-fold risk of EOCRC than shorter carrying duration (lower tertiles), adjusted odds ratio (aOR)=4.1, 95% confidence interval (CI):1.0-16.4. The association was stronger for rectal cancer (OR=6.4) vs. colon cancer (OR=1.9), given the closer proximity of pants' pockets to the rectum. Most strikingly, the association was much stronger for ipsilateral carrying (cellphone carrying on the same side of EOCRC tumor location) with a OR=12.1 (1.5-97) vs. contralateral carrying (cellphone carrying on the opposite side of tumor location) with OR=1.6.

CONCLUSIONS: A longer duration of cellphone carrying below the waist is associated with an increased risk of EOCRC. Though preliminary, the finding revealed an emerging environmental contributor to the rapid rise in EOCRC, whose reasons remain unknown.

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