Tobacco use is the most preventable cause of cancer. Smoking itself accounts for approximately 30% of all cancer-related deaths in the United States. Furthermore, colorectal cancer (CRC) is the second most common cause of cancer death in the United States. In 2020, approximately 147,950 individuals were diagnosed with CRC and 53,200 died from the disease. 11%–22% of these new CRC cases were attributable to tobacco use. Although past studies have demonstrated a significant association of cigarette smoking with CRC incidence and mortality, there is very little existing literature that has shown the impact of cigarette smoking on the outcomes of metastatic colorectal cancer (CRC). The impact of smoking on the survival and features of metastatic CRC remains unclear.

Aims

Aim 1: Identify the clinicopathological and pathology features of colorectal cancer patients who smoke and compare them with those who do not smoke. This will focus on a dozen specific characteristics previously identified as critical to overall survival. These correlations will be helpful in interpreting survival outcomes in Aim 2.

Aim 2: Explore the association of smoking with overall survival of metastatic colorectal cancer patients. I will use an institutional database to explore the impact of smoking with survival after diagnosis. I will use a multivariate model to incorporate known existing prognostic factors explored in Aim 1.

Aim 3: Explore the molecular pathology of how cigarette smoking is associated with colorectal cancer. Genetic and environmental factors cause accumulation of genetic and epigenetic mutations, altering the stem cells or stem cell-like cells in the base of colon crypts, which may progress to more aberrant versions. Cancerous mutations involve several different genes that may be exacerbated by smoking. I will use an existing database to explore association of smoking with key mutations of interest for CRC.

Methods

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References


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The aims of this research study were to associate cigarette smoking with survival outcomes and molecular features of metastatic colorectal cancer patients by analyzing an institutional database. Preliminary data suggests that smoking history has a modest effect on overall survival in metastatic patients compared to a non-smoker. It also suggests that there may be a correlation between smoking and KRAS/BRAF mutations in metastatic CRC patients.

Conclusions

Smoking is linked to survival outcomes and molecular features of metastatic colorectal cancer. The association of smoking with colorectal cancer and its clinical, pathological, epidemiological, and molecular features still need to be better understood. Future research findings will help point to risk factors involved with smoking in colorectal cancer patients and at-risk patients. Further findings may help to identify markers and patterns that will lead to a faster metastatic CRC diagnosis and an overall better prognosis (improved survival rate and increased survival time). Ultimately, the findings should aim to push forward the agenda of smoking cessation in metastatic CRC patients, at-risk patients, and the general population.