Chemotherapy-induced cardiotoxicity in patients with colorectal cancer: systematic review (Work-in-progress)

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Introduction

Progress in treatment with chemotherapy, amongst other reasons, has led to an increase in the survival in patients with colorectal cancer (CRC). As a consequence potential negative side effects of chemotherapy need to be considered carefully during cancer therapy.

One major negative consequence is the cardiotoxicity of certain chemotherapy-regimens which can lead to:

- limitations of the chemotherapy-dosage
- impaired quality of life
- earlier death.

Though improvements have been made, the cardio-toxic effects of the agent 5-Fluorouracil (5-FU), which is a cornerstone in CRC treatment, are still existent. Especially patients with existing heart conditions or older patients are at risk to suffer from cardio-toxic side effects, which can have an important influence on therapy planning.

The aim is to systematically review the incidence of cardiovascular events in colorectal cancer patients who underwent chemotherapy and assess their current situation regarding cardiotoxicity of chemotherapy.

Methods

A systematic review has been conducted using the medical databases PubMed and Web of Science. The protocol of the systematic review will be registered in the international prospective register of systematic reviews (PROSPERO) and is currently under review for registration.

Full-texts will be screened by a second independent reviewer. The PRISMA flow diagram is used to document the selection-process at all stages (Figure 1).

Inclusion criteria are as follows: original studies on patients with CRC, who underwent chemotherapy treatment and defined cardiotoxicity as an outcome. The latter includes cardiovascular events, for example cardiovascular disease, hypertension, heart failure, venous thromboembolism, ischemia, etc. Studies were excluded, if they only provided data on the combination of chemotherapy and Bevacizumab.

Results

A total of 2,949 papers were retrieved from the databases. After screening the titles and abstracts a total of 95 papers were eligible for full-text-screening.

After full-text-screening another 65 papers were excluded, due to not providing data on chemotherapy only (n=42), no stratification for colorectal cancer (n=8), no original paper (n=8) or cardiotoxicity was not the outcome (n=7).

Figure 1: Flow-diagram visualizing the screening process

Preliminary screening of the 30 remaining studies indicate that the majority investigated cardiotoxicity in 5-fluorouracil-based combination chemotherapies (90%), including Capecitabine. Three studies do not define the chemotherapy agents, but as fluorouracil-based chemotherapy is standard of care in CRC patients, it is likely that these studies investigated 5-FU-based chemotherapy as well.

Outlook

The results of this systematic review will help to assess cardiovascular risk in CRC patients due to chemotherapy-regimens. The identification of risk groups can contribute to more considerate cancer therapy planning and monitoring and thereby improve care of CRC patients. Further research should investigate the possibility of cardiovascular late effects, which can occur several years to decades after therapy and where information is still rare.

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