

ABSTRACT

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Title of Thesis: Natural substances and their role in the prevention and treatment of cancer

A rigorous thesis is focused on natural substances used in the therapy or prevention of cancer.

Cancer is one of the most common causes of death worldwide, it is placed on the second place, followed by cardiovascular diseases. Basically, three main mechanisms are used in the treatment of cancer: surgery, radiotherapy and chemotherapy. Mostly the combination of these three is applied.

Chemotherapy is the treatment using cytostatics. There are natural cytostatics which can be divided into four groups: Vinca alkaloids, Taxanes, Podofylotoxin derivatives, camptothecin. Vincristine, vinblastine, vinorelbine, vinflunine, paclitaxel, docetaxel, etoposide, teniposide, topotecan and irinotecan are considered as the main representatives of these four groups. These substances have been already used to treat cancer and there are many products consisting of them registered in the Czech Republic. In addition to natural cytotoxics, other compounds are synthesized. These compounds enable wider therapeutic usage, smaller toxicity and reduced resistance. These substances are being studied further.

In the next part of the thesis, the substances which are used especially for the prevention of cancer are described. People who suffer from cancer are willing to try new forms of therapy and prevention. The interest in other natural substances with an anti-carcinogenic effect, which has been proved at the cellular level, animal models and in epidemiological studies, have rapidly increased.

A epigallocatechin - 3 - gallate from green tea, flavonoids, isoflavones, resveratrol, carotenoids (lycopene, beta carotene), curcumin and garlic can be mentioned as examples.

Patients with cancer usually take natural products as well as conventional medicine, which causes mutual interactions. These interactions can be either pharmacodynamic or

pharmacokinetic, positive or negative. A doctor should always be informed of what natural substances are being taken.

Natural substances have a long history of prevention and treatment of different diseases, cancer included. Their discovery and usage is definitely of benefit to patients as well as doctors.