

Determining patient radiosensitivity from blood samples

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Credit: University of Gothenburg

How much radiation or chemotherapy can a certain person handle? With help from blood or tissue testing, it may be possible to answer this question in advance, which in turn could improve treatment, as research at Sahlgrenska Academy shows.

"Although our research is at an [early stage](#) and we need to do more studies, the idea is that it will be possible to test sensitivity and prevent

extremely sensitive patients from having serious side effects," says Sherin Mathew, a doctoral graduate at the Institute of Biomedicine.

All [cancer](#) patients are given roughly the same doses of radiation and chemotherapy, despite the major variation in sensitivity. The extent of the side effects varies from person to person, but at present there are no ways of knowing how each person will be affected.

As a result, some will experience discomfort, while others will suffer much more. The most sensitive patients may experience such severe side effects that they die because of the [treatment](#).

Adjusted Doses

Blood samples may, however, help to identify the most sensitive patients before their treatment begins, which will mean that their dose can be adjusted. While working on her thesis, Sherin Mathew contributed to the development of methods that could be used to establish which patients fall into the "extremely sensitive" category, using lymphocytes from [blood samples](#) and so-called dermal fibroblasts, which are found in the dermis.

A special analysis method, flow cytometry analysis, can be used to track the patient's blood cells' ability to split when they are exposed to radiation and [chemotherapy treatment](#) in test tubes. The results may give answers as to how sensitive the individual is to the harmful substances used in the treatment of cancer.

Predictions Possible

Sometimes it may take weeks or months for side effects to appear, or even years after the [cancer treatment](#) before they present themselves.

This makes it very difficult to determine which patients are actually most sensitive, even after the treatment has begun, unless they have undergone the tests in question.

"The main idea behind our method is to measure patient sensitivity during the planning process for the cancer treatment and to identify which patients are extremely sensitive. It will be better to have this knowledge about the [patients](#); as it stands right now we don't know how each patient will respond when the radiation or chemotherapy is administered," Sherin Mathew points out.

More information: Dissertation: Measurement of sensitivity to DNA damaging agents. gupea.ub.gu.se/handle/2077/52411

Provided by University of Gothenburg

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