Cancer cells in blood can identify risk of recurrence in breast cancer

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Cancer cells circulating in the blood, or circulating tumour cells (CTCs), are known to be associated with a bad prognosis in women with metastatic breast cancer. Now, for the first time, a group of scientists have shown that they can also detect CTCs before and after chemotherapy treatment and hence may be able to identify those patients likely to have a recurrence of their cancer after such treatment in future.

Dr. Julia Jückstock, from the University of Munich, Munich, Germany, told a press conference at the European Cancer Conference (ECCO 14) today (Monday September 24) that the results could help improve the design of trials of chemotherapy in breast cancer, as well as reducing costs to health services.

The team, led by Dr. Brigitte Rack, also from Munich, set out to look at the role of CTCs in blood at the first diagnosis of breast cancer and during adjuvant chemotherapy and endocrine treatment. They analysed blood samples from 1,767 node-positive and high-risk node-negative breast cancer patients before the start of their treatment, and compared the results to those obtained from 852 of the same patients after completion of chemotherapy.

“We found that 10 percemt of patients whose blood was sampled before the start of treatment had more than one CTC, and 5 percent of these patients had more than two CTCs in approximately 20 ml of blood,” said Dr. Jückstock. The presence of CTCs did not correlate with other prognostic factors such as tumour size, grading, hormonal or Her-2 status, but the scientists did see a significant correlation with the presence of lymph node metastases.

Of 24 healthy individuals used as controls, none showed more than one CTC, said the scientists. Among the 852 patients whose blood was analysed post-treatment, 11 percent were CTC positive before the start of treatment, while 7 percent had more than one CTC after completion of chemotherapy.

Of those patients who were initially CTC positive, 10 percent remained so and 90 percent had a negative CTC test after chemotherapy. Of those initially CTC negative, 93 percent remained negative, whereas 7 percent had a positive CTC result.

The advantage of screening for CTCs is that, unlike other predictive factors, including genetic signatures, it can be carried out after the completion of primary therapy, and, if needed, on other occasions during the duration of disease. Other predictive methods can only be used on diagnosis, and only once, say the scientists.

Previous work on the detection of CTCs in bone marrow had also been shown to have predictive value, said Dr. Jückstock. “It is easier to work with bone marrow, because the volume of CTCs is much higher than in blood in the case of a positive status. However, because bone marrow is not easily accessible it is difficult to use this technique on a large scale. It is very much simpler, and more patient-friendly, to take blood samples for analysis.

“We think that the persistence of CTCs after chemotherapy treatment is likely to be predictive of the likelihood of recurrence of cancer in these patients,” said Dr. Jückstock, “and we will be working to analyse the prognostic value of our findings. If this proves to be the case, it will open the door to a simple way of monitoring the likely outcome of chemotherapy, as well as enabling us to target treatments more precisely. For example, for those patients who have an increased risk of recurrence, we could prolong or alter the chemotherapy regime to give them a better chance of recovery. For those who are likely to respond well to treatment, we could reduce the length of treatment and use less aggressive therapies, thus

sparing unpleasant side effects.

“We expect to have these results in the next five years,” she said, “and if they are as expected, we are optimistic that our research can bring about a real improvement in the way chemotherapy is used in breast cancer patients.”

Source: Federation of European Cancer Societies