

San Antonio Breast Cances Meeting

Real time monitoring the efficacy of adjuvant therapy in breast cancer by quantifying the reduction of circulating tumor cells using the MAINTRAC analysis (laser scanning cytometry of magnetic bead enriched cells).

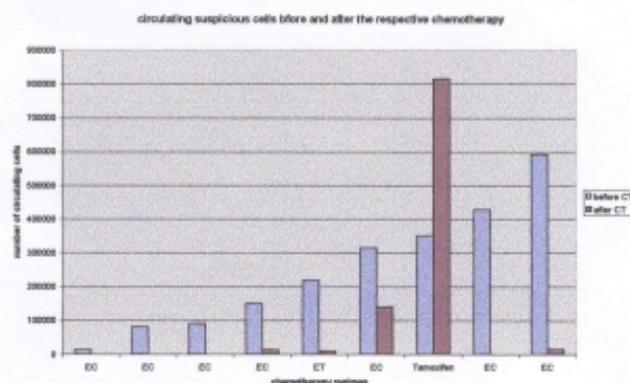
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The frustrating observation, that metastases are the most common causes of cancer related death in breast cancer in women in the United States and Europe even in patients with early stage disease, has led to a variety of strategies in adjuvant chemotherapy (CT). However, besides a reduction in tumor size in the neoadjuvant situation until now there has been no method available to directly monitor the success of the applied therapy in the individual patient. Since it is assumed that metastases are due to tumor cells disseminated into the circulation, the aim of the present study was the quantification of such circulating suspicious cells and monitoring their reduction in response to the applied therapy.

So far 100 breast cancer patients and 50 normal donors have been screened for circulating cells carrying epithelial antigens in peripheral blood by the MAINTRAC approach. For this purpose red blood cells were lysed from 20ml of peripheral blood and the cells carrying epithelial antigen enriched using magnetic beads and stained for epithelial antigens using fluorochrome labeled antibody. The enriched cell population was then measured in a laser scanning cytometer and positive events controlled visually. In a previous work we had shown the this procedure allows to detect down to 10 tumor cells in 20ml of whole blood with a recovery rate of 90%.

In 49 normal donors the only cells staining positively were skin epidermal cells but one healthy donor who was tested repeatedly had varying numbers of positive cells suspicious for tumor cells and this test person will be further observed. In breast cancer patients the numbers of epithelial antigen positive cells were calculated per 5l blood volume and varied over 5 decades (from 10³ to 10⁷) and only in 4 patients suspicious cells were undetectable. For 9 patients rescreening has been performed after the adjuvant chemotherapy regimen. All, but one patient treated with tamoxifen only, showed a reduction in circulating suspicious cells. The reduction varied due to the initial stage and the regimen applied (Fig 1).



Thus the MAINTRAC approach allows for the first time a direct and current individual control of the therapeutic effect in the adjuvant situation in solid tumors.