

Abstract

The treatment of locally advanced rectal cancer is multimodal. It includes neoadjuvant radiochemotherapy (NCHRT), which reduces the risk of local recurrence. However, this treatment is also accompanied by side effects. Accordingly, there is an unmet need to identify predictive markers allowing to identify non-responders to avoid its adverse effects. We monitored circulating tumor DNA (ctDNA) as a potential liquid biopsy-based biomarker. We have investigated ctDNA changes plasma during the early days of NCHRT and its relationship to the immediate tumor response as well as overall patients survival. In all patients, ctDNA was strongly reduced or completely eliminated from plasma by the end of the first week of NCHRT, with no correlation to any of the parameters analyzed. As ctDNA was reduced indiscriminately from the circulation of all patients, therefore the dynamics during the first week of NCHRT is not suitable for predicting the immediate therapeutic response in rectal cancer. The baseline ctDNA presence represented a statistically significant negative prognostic biomarker for the overall patient survival. However, the general effect of rapid ctDNA disappearance apparently occurring during the initial days of NCHRT is noteworthy and should further be studied.

Keywords: rectal cancer, neoadjuvant chemoradiotherapy, circulating tumor ctDNA, prediction, prognosis, response, therapy, biomarker