1H NMR-based metabolomics in head and neck cancer treatment – whether it may be helpful for a clinician?

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Head and neck cancers (HNC) develop in organs crucial for respiratory, nutritional, and social functions. The standard organ preservation treatment methods for HNC are sequential and/or concurrent radiotherapy (RT) and chemotherapy (CHT). Intensified treatment modalities improved the survival of the patients with HNC, but are associated with significant temporary or permanent toxic side effects in normal tissue and/or involved regions (acute radiation sequelae, ARS). The metabolic composition of blood is known to reflect the response of organisms to disease as well as treatment-related and environmental factors. 1H NMR-based serum metabolomics has been used to investigate the molecular response to anticancer treatment, with particular emphasis on its toxicity. We were able to identify metabolic alterations characteristic of the direct response to RT/CHT and secondary effects resulting from treatment-induced toxicity. The obtained results not only constitute the basis for further research on personalized medicine, but also show potential for future use in clinical practice.