HOLY-2020

Title Improved treatment stratification for Hodgkin lymphoma patients through the use of deep learning, molecular imaging and relevant clinical data

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Abstract

Cancer cells need a lot of sugar (also: glucose) for their rapid replication and the growth of a tumour. It is possible to visualize the sugar consumption by an imaging technique called Positron Emission Tomography (PET). This is done by providing the patient with minuscule amounts of radioactively labelled molecules of sugar; their path inside the body can then be tracked from the outside within a few minutes.

PET is well-established in the diagnosis and treatment monitoring of Hodgkin's lymphoma (HL). HL is a type of tumour that can be characterized by its sugar consumption. Thus, PET enables early monitoring of treatment response, that is shows if the lymphoma shrinks or grows, reflecting whether the therapy is working or not working. So far, only very basic information of the acquired PET images is used. Since the biology of HL is linked to its metabolism, we aim to analyze PET images in more detail by using artificial intelligence algorithms. By doing so, we seek to identify those patients specifically who suffer from aggressive HL and who are in need of more intense treatment. The same algorithms can hopefully be used also to identify patients with a favourable prognosis and who require less intense treatments with fewer side effects.

All in all, our anticipated combination of PET imaging with AI postprocessing holds the potential for personalized treatment planning with immediate and long-term benefits to patients.

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