Study aims to qualify ADC as predictive imaging biomarker in preoperative regimens

January 4 2016, by John Bean, Phd

Diffusion weighted (DW) magnetic resonance imaging (MRI) is a widely used technique to detect and characterize cancers as well as to monitor response to therapy. DW-MRI offers numerous advantages for patients with cancer and their treating physicians. It is a non-invasive imaging tool which does not require the administration of contrast agents nor ionizing radiation. Furthermore, it can be obtained relatively quickly, in a couple of minutes, and is easily incorporated into routine patient evaluations.

DW-MRI can measure the apparent diffusion coefficient (ADC), a quantitative parameter that can be used as a biomarker for assessing response to treatment. Low ADC values, for example, are found in tissues having restricted diffusion of water molecules, such as tumors, lymph nodes, or in areas of fibrosis. High ADC values, on the other hand, are found in tissues where water molecules can freely diffuse, such as in glandular or necrotic tissues. ADC is thus a potential imaging biomarker for characterizing cellular integrity, and it could enable early identification of cell death caused by chemotherapy and/or targeted treatments.

Colorectal cancer is the second leading cause of cancer related deaths in the western world, and DW-MRI is potentially well suited for patients with this disease. In this light, EORTC trial 1423 has opened to evaluate DW-MRI in patients with resectable liver metastases from colorectal cancer treated with preoperative therapy. Here, the value of early changes in ADC predicts treatment response against pathology will be qualified in colorectal liver metastasis in a multicenter prospective study.

Prof. Sigrid Stroobants of the Universitair Ziekenhuis in Antwerp, Belgium, and coordinator of this study says, "About half of all patients with colorectal cancer will develop metastases, and despite improvements in surgical techniques and new chemotherapy regimens, 5-year survival rates remain below 60%. For patients with colorectal liver metastases, neoadjuvant chemotherapy plays an important role in managing their disease."

"In studies led by the QuIC-ConCePT consortium, we established and tested a standardized and optimized DW-MRI protocol for reproducibility in a multicenter setting," continues Prof. Stroobants. "In EORTC trial 1423, DW-MRI and the measurement of ADC will be qualified as an early read out marker for assessing response to treatment."

High ADC values are found in necrotic tissues. If the chemotherapy effectively kills the tumor cells, it causes the cell membranes to lose their integrity, and this loss in integrity can be measured by their ADC. ADC is a potential imaging biomarker for characterizing cellular integrity and, consequently, early identification of cell death induced by chemotherapy, anti-angiogenic or anti-EGFR mAb combination.

EORTC trial 1423 is coordinated by the EORTC Imaging and EORTC Gastrointestinal Tract Cancer Groups and will accrue up to 120 patients at 15 institutions in five countries: Austria, France, Germany, Italy, and Spain.

This EORTC sponsored imaging biomarker driven study is part of QuIC-ConCePT, a project supported by the Innovative Medicines Initiative Joint Undertaking under grant agreement number 115151, resources of which are composed of financial contribution from the European Union's Seventh Framework Programme (FP7/2007-2013) and EFPIA companies' in kind contribution.

Provided by European Organisation for Research and Treatment of Cancer

Citation: Study aims to qualify ADC as predictive imaging biomarker in preoperative regimens (2016, January 4) retrieved 26 April 2024 from https://medicalxpress.com/news/2016-01-aims-adc-imaging-biomarker-preoperative.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.