

PET-MRI imaging of cellular trafficking of lipid metabolism and its association with inflammatory and genetic markers in breast cancer

ABSTRACT

The tumour landscapes are varied, and depending on the orchestration of specific molecular pathways, signaling of its early manifestation could be understood. The conventional ways to signal the metabolic expression of cancers are notably via recognizing the altered glycolytic pathways in the cells whereby the transport of glucose is unchecked by the high demand of the ATP production by the cancer cells. It is notwithstanding that by relying on the glucose analogue (flurodeoxyglucose, FDG) signaling in cells, there are other cellular mechanism deemed to be explored, that is, the cell membrane or lipid metabolism. Molecular imaging–based nanoparticles are proving useful for cell trafficking studies, whereas radionuclide- and optical-based molecular–genetic reporters are yet to be determined. On the other hand, for receptor- or enzyme-based imaging or for studying the pharmacokinetic disposition of chemotherapeutic agents, the radionuclide-based techniques predominate. This review highlights the utility of the molecular imaging techniques in expressing the altered lipid metabolism, that is, choline transport in cells as an index of tumour aggressiveness in breast cancer.

Keyword: Genetic markers; Inflammatory markers; Lipid metabolism; PET-CT; PET-MRI; 18F-FCH