



Assessing immune response upon systemic RNA vaccination on [18F]-FDG PET/CT for COVID-19 vaccine and then for immuno-oncology?

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Dear Sir,

The publication “18 Fluorodeoxyglucose PET/CT findings in a systemic inflammatory response syndrome after COVID-19 vaccine” reports the case of a 65-year-old woman with increased glucose metabolism in lymphoid tissues diagnosed on [18F]-FDG PET/CT performed 4 days after the first dose of mRNA COVID-19 vaccine [1]. This finding highlights the phenomenon of reactive adenopathy on imaging examinations following vaccination and the need for increasing public awareness and guidelines for clinical practice [2].

The *Lancet* report also raises the potential of [18F]-FDG PET/CT as a potent tool to assess immune response after mRNA vaccinations. There is now an abundance of evidence demonstrating that immune response increases glucose metabolism in lymphoid organs, which are critical modulators of T-cell immunity [3].

The technology of mRNA vaccination offers promising prophylactic and therapeutic potentials in several medical fields including immuno-oncology [4]. Therefore, current

oncological clinical trials should consider the potential theranostic value of [18F]-FDG PET and correlate temporal changes in glucose metabolism of lymphoid tissues with treatment outcome. For instance, a rapid and transient increase in spleen glucose metabolism after RNA cancer vaccine connotes robust immune activation and T-cell proliferation [5]. The same argument can be made for hypermetabolic draining lymph nodes, which could reflect a prominent B cell germinal center activation and an effective humoral response elicited by mRNA vaccine [6].

In conclusion, while the contemporary role of [18F]-FDG PET/CT is predominantly cancer imaging, there is a paradigm shift toward assessing healthy lymphoid tissues for in vivo quantification of the immune response. In the setting of RNA vaccination, this could be used as a theranostic tool for a wide range of indications in multiple therapeutic areas.

Declarations

Ethics approval This article does not contain any studies with human participants performed by any of the authors.

Consent to participate Not applicable.

Conflict of interest The authors declare no competing interests.

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