Review of: "T _{max} Volumes Predict Final Infarct Size and Functional Outcome in Ischemic Stroke Patients Receiving Endovascular Treatment"

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Fainardi et_al[1] explored the utility of computed_tomography_perfusion (CTP) in ischemic stroke patients with anterior large vessel occlusion selected for endovascular treatment (EVT), using time to maximum concentration (Tmax)-based target mismatch with the GE CTP_4D[2]. To date, few data are available on Tmax-Tmax mismatch ability in predicting

outcome.

The main finding of this valuable study is that multiple CTP Tmax parameters are independently associated with functional outcome and with final_infarct_volume (FIV), thus demonstrating the ability of these parameters to predict radiological and clinical outcomes. This study proposes a new CTP target mismatch based on specific threshold values of Tmax alone for identifying critically hypoperfused tissue (Tmax>9.5_seconds) and ischemic core (Tmax>16_seconds).

However, despite the incontrovertible association between FIV and Tmax_volumes, it would be important to report the prognostic accuracy of Tmax maps in predicting FIV, using quantitative or qualitative assessment, in order to evaluate the discrepancy between FIV, non-viable tissue (NVT) and tissue at risk (TAR). For the decision-making process, both over- and underestimation of NVT and TAR volumes may have important clinical consequences in the management of acute stroke. Specifically, the overestimation of NVT could have serious consequences in not selecting potential candidates for a reperfusion treatment[3].

In our recent publication[4], CTP-Tmax maps for stroke_detection achieved a sufficiently reliable diagnostic accuracy, but this was not optimal. CTP-Tmax>16s had a tendency to overestimate NVT compared to FIV, in patients with favorable clinical-instrumental outcomes, as in prior studies[3][5][6]. In the subgroup of patients undergoing EVT, NVT almost entirely overestimated the follow-up lesion areas, even outside of the golden hour[5][7]. Similarly, using CTP-Tmax>9.5s the degree of correlation with FIV was in favor of an overestimation of TAR in the vast majority of patients untreated or with reperfusion treatment failure, with a tendency to incorporate the benign oligoemia.

Considering these findings, may the authors claim if they found similar FIV overestimation using Tmax different threshold for NVT and TAR? In_table_1[1], authors reported a median Tmax>16s volume of 30_ml (11–77) and a FIV of 29 (10–92) with larger differences in the two mRS subgroups. What could Authors tell us about the case-by-case differences and their impressions?

This is a crucial point for determining whether Tmax_mismatch may be a useful parameter for treatment decision-making or it is not reliable enough, in order to make the role of CTP increasingly central in the acute setting and allow clinicians to have a reliable and safe tool.

Declarations

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Author Contributions: F.G. and A.Z. wrote the article.

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