Quality of voriconazole therapeutic drug monitoring and its correlation with clinical outcomes: a systematic review

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Background

Voriconazole is a triazole antifungal with variable pharmacokinetics. Although therapeutic drug monitoring (TDM) is used to optimise voriconazole use, the pre-analytical, analytical and post-analytical components of TDM have not yet been systematically evaluated.

Objectives

1. To evaluate the procedures associated with voriconazole TDM at the pre-analytical, analytical and post-analytical phases in published studies.
2. To investigate the correlation between the quality of voriconazole TDM procedure and clinical outcomes.

Methods

We searched PubMed and Web of Science (Core Collection) for studies which evaluated voriconazole TDM in humans. Eligible studies were assessed for risk of bias based on the level of completeness of critical items at each phase of TDM. Studies using specified diagnostic and outcome criteria were analysed for the second objective.[1-6]

Results

- Forty-five studies were included.
- Only 3 (6.7%) studies reported ≥80% of the TDM procedure items assessed.
- Overall, commonly omitted items were drug intake with or without food, patient adherence, sample transport and storage conditions, duration of sample storage, assay details and validation, dose adjustment recommendation and its implementation.
- Due to heterogeneity of clinical outcome assessment, data of the 10 eligible studies could not be pooled for analysis.

Conclusion

We identified substantial heterogeneity in the quality, reporting and evaluation of voriconazole TDM. A consensus guideline on the conduct and reporting of TDM could potentially improve the comparability of future studies.

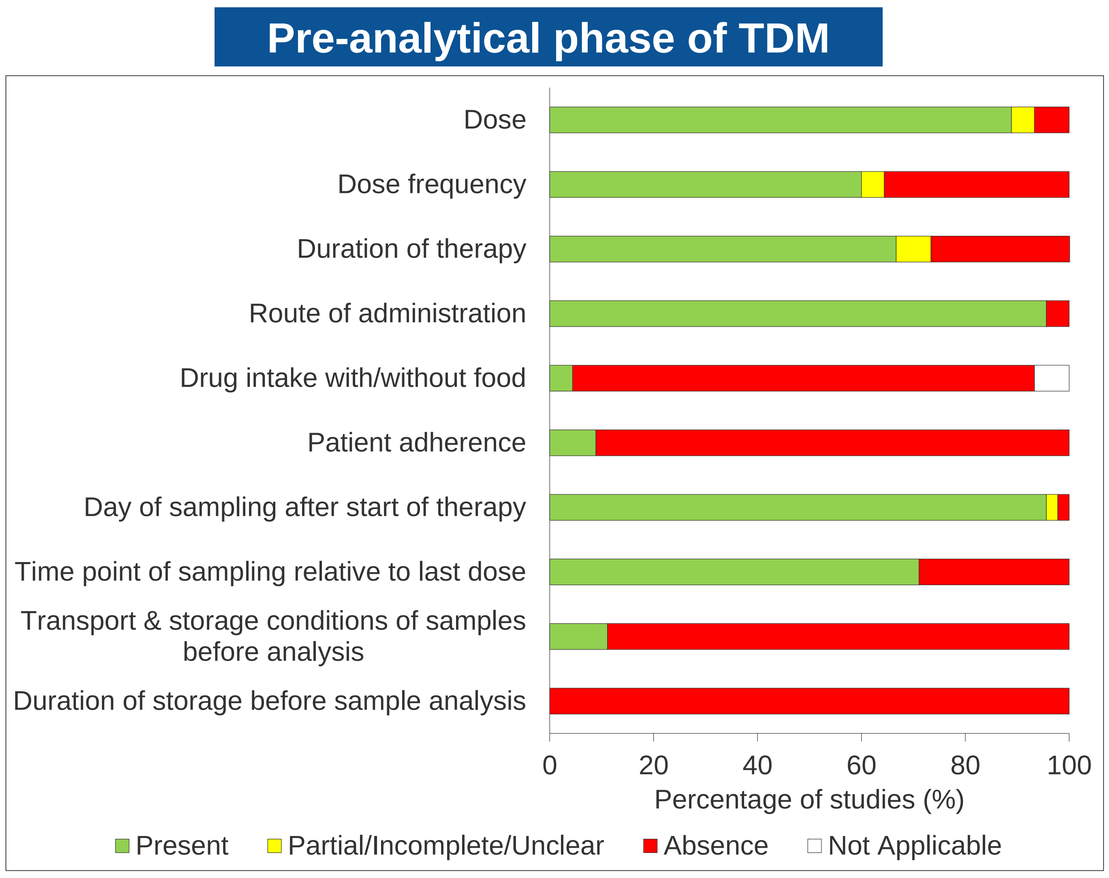

Figure 1. Percentage of study (n=45) for each criterion at the pre-analytical phase of TDM.

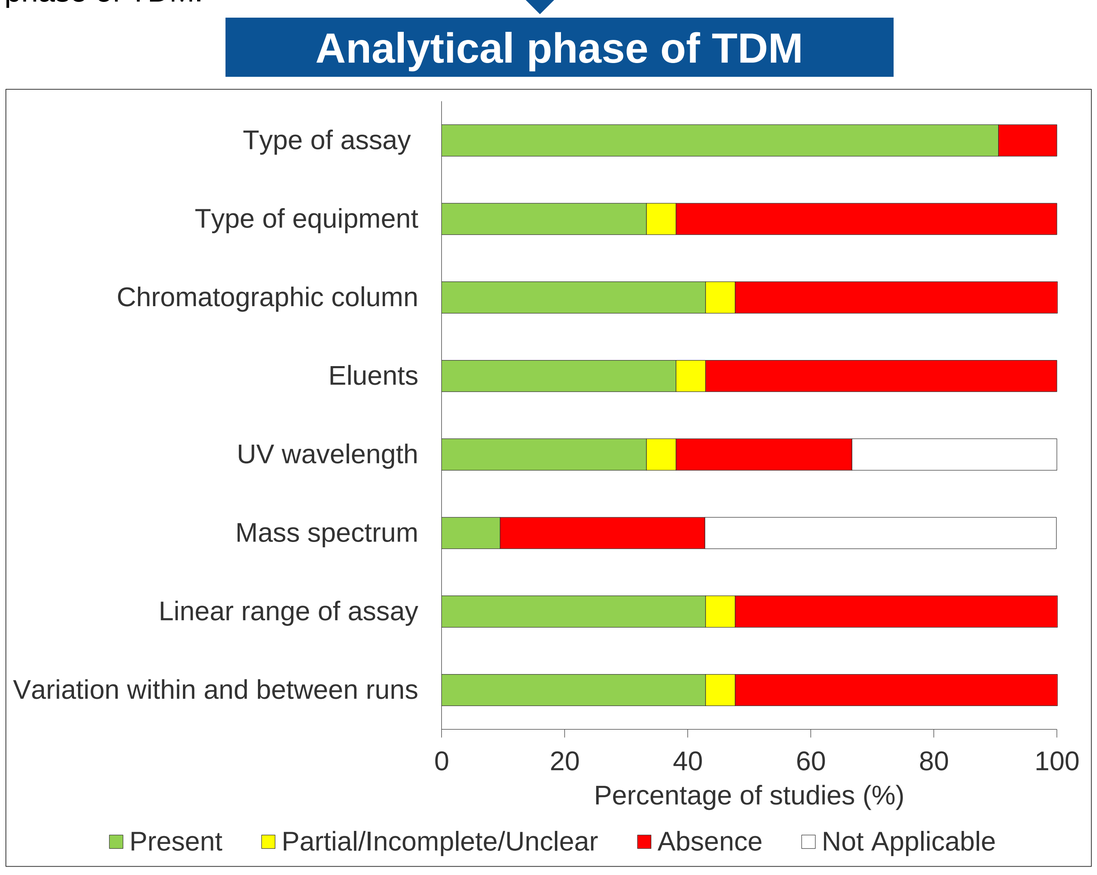

Figure 2. Percentage of study (n=21) for each item at the analytical phase of TDM (for the 21 studies which did not report following the FDA/EMA validation guidelines or participate in a proficiency testing programmes or provide a published reference with full details of a validated assay for the assay in the study).

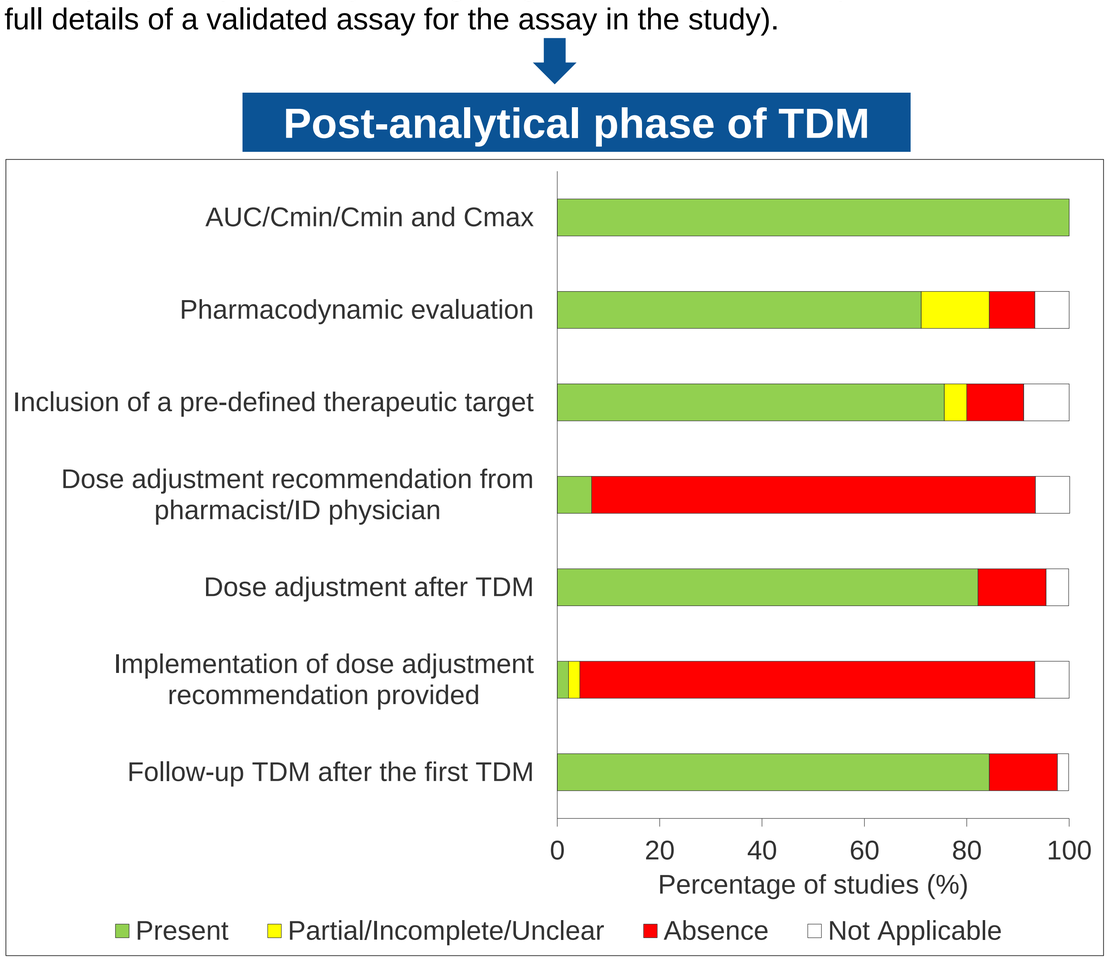

Figure 3. Percentage of study (n=45) for each item at the post-analytical phase of TDM. AUC: area under the concentration-time curve; C_{min}: trough concentration; C_{max}: peak concentration.

References:

1. De Pauw *et al.,* CID, 2008
2. Segal *et al.,* CID, 2008
3. Husain *et al.,* J Heart Lung Transplant, 2011
4. Blot *et al*., Am J Respir Crit Care Med, 2012
5. Patterson *et al.,* CID, 2016
6. Groll *et al.,* Lancet Oncol, 2014

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