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Lost and found: how missing data connects TXA and outcomes in severely injured patients

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In this issue of *Trauma Surgery and Acute Care Open*, Donohue and colleagues[1] conducted a secondary analysis to determine the effect of missing data on thrombelastography (TEG) outcomes in patients receiving tranexamic acid (TXA) versus placebo in the Study of Tranexamic Acid During Air Medical and Ground Prehospital Transport (STAAMP) trial.[2] Patients without available TEG measurements (NO-TEG, 7%) had higher incidences of hypotension, depressed Glasgow Coma Scale score, prehospital intubation and 30-day mortality. Informed by this, they conducted an insightful analysis of all patients in these subgroups and found that patients with severe shock who received TXA demonstrated an improvement in LY30 on TEG. Taken together with the 30-day mortality benefit reported in this same cohort in STAAMP,[2] they concluded that these findings support the use of TXA in trauma patients with severe shock.

As the authors mention, one of the major issues with performing emergency research is the critical nature of the patient population, which often requires time-sensitive interventions for hemorrhage control and makes collection of data, such as TEG measurements, difficult. Consequently, less critical patients have more complete data sets, and the most critical patients often have significant missing data. Since the re-emergence of TEG, investigators have attempted to demonstrate an association between TXA and the LY30, a measurement of fibrinolysis. Logically, TXA *should* decrease the LY30 on TEG based on its mechanism as an antifibrinolytic drug. However, this has not been demonstrated to date in any large clinical trials.[2 3] The present study by Donohue and colleagues suggests that missing data are important and that, perhaps, the lack of an observed difference in LY30 until now is because the patients who are most likely to demonstrate LY30 improvement after TXA are also the patients least likely to undergo TEG.[1 2]

We applaud the authors for making this connection. This study underscores the challenge of working with the critically injured. Furthermore, it reinforces the need to analyze data critically and develop novel techniques to answer difficult questions, as these authors have demonstrated. While the present findings are not conclusive, the preponderance of evidence suggests that TXA may improve mortality in the bleeding trauma patient, even if the underlying mechanisms have not been completely elucidated.[4 5] The findings of this study add to that evidence, with the novel finding that LY30 improves in patients with severe shock who receive TXA, supporting the mechanism of action of TXA and suggesting patient selection is critical in realizing this benefit.

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Competing interests Dr. Meizoso is on a Scientific Advisory Board for Haemonetics, Inc. He has received speaking honoraria from Cerus, Corp., and received research support from Takeda Pharmaceuticals and CSL Behring. He is also on the Editorial Board for TSACO.

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