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Letter to the Editor

Comments on article "Discrepancies between conventional and viscoelastic assays in identifying trauma induced coagulopathy"[☆]

To the Editor:

Sumislawski et al. have compared conventional (INR/PTT) and viscoelastic assays (rapid-TEG) in identifying coagulopathy in trauma patients. They concluded that 33% of patients had coagulopathy by at least one conventional or viscoelastic parameter in their studied population. Among these coagulopathic patients 20% had isolated abnormal INR/PTT, 49% isolated abnormal TEG, and 31% both abnormal conventional and viscoelastic assays. They showed that patients with abnormal conventional assays had higher mortality than patients with abnormal TEG results. They concluded that, although TEG guided resuscitation has been shown to improve survival, INR/PTT identified coagulopathic patients with highest mortality. Further, they concluded that INR/PTT reflect coagulation factor deficiencies. The authors suggest that factor repletion might be the appropriate therapy for patients with abnormal INR/PTT and normal TEG.

These findings are very interesting, and we would like to make a few comments. Historically, these authors have published several articles in which TEG guided hemostatic resuscitation was advocated, since viscoelastic assays could identify specific clotting deficits.^{1–4} The results of this current study seem to contradict this claimed superiority of TEG. Controversies in usage of viscoelastic tests in guiding trauma induced coagulopathy are not new and have been described previously.^{5–9} Unfortunately, these papers were not referenced.

In this study, 839 patients were included in two US level-1 trauma centers in 7.5 years. Since these centers are known for high volume of trauma patients, we wondered what selection criteria for inclusion were used in this study, and what patients were excluded. When analyzing the studied groups more into detail, there is a striking difference between patients who had conventional assays and patients who had TEG; INR/PTT patients were more severely injured, with higher AIS head, were more acidotic, received both more crystalloids and blood products, and had higher mortality than patients who had TEG. There is no mentioning in the manuscript how patients were enrolled for either group. Since TEG guided resuscitation was only used in Denver, it is suggested that the TEG group and the combined INR/PTT and TEG group were treated in Denver and the INR/PTT group in San Francisco. This is a potential selection bias. Furthermore, although patients in the TEG group were not severely injured and received barely any blood product, they had abnormal TEGs. How could that be explained?

Further, the authors state that viscoelastic tests are superior to conventional tests in guiding hemostatic resuscitation, identifying hypercoagulability and quantify clot degradation by percent lysis. Hyperfibrinolysis as measured by LY30 is related to higher mortality,¹⁰ then why was LY 30 not measured? Isn't a major advantage of TEG having data on fibrinolysis?

The authors suggest to only replete selective coagulation factor deficiencies. Likely, bleeding trauma patients will have more than one coagulation factor deficiencies as was shown in table 3. Fresh frozen plasma (FFP) contains usually fibrinogen, 65–100% activity of factors II, V, VII, VIII, and X. Wouldn't it be more practical to administer FFP instead of several separate coagulation factors? Previous attempts to selectively administer coagulation factor were mildly successful. Although administration of recombinant FVIIa has shown to reduce blood product use, it failed to reduce mortality compared with placebo.¹¹

We feel that the results of this study demonstrate that conventional coagulation assays are adequate in diagnosing coagulopathy in patients who were severely injured after blunt trauma. The question that still remains is "what is the additional value of TEG?"

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.amjsurg.2019.02.004>.

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Karlijn J.P. van Wessem*, Luke P.H. Leenen
University Medical Center Utrecht, Utrecht, the Netherlands

* Corresponding author.

E-mail address: kwessem@umcutrecht.nl (K.J.P. van Wessem).

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