



Is it time to also use hematologic parameters for the diagnosis and prognosis of testicular torsion?

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Comment on: Lee HY, Lim DG, Chung HS, *et al.* Mean platelet volume is the most valuable hematologic parameter in differentiating testicular torsion from epididymitis within the golden time. *Transl Androl Urol* 2022;11:1282-91.

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In the article, Lee and collaborators (1) examine the role that hematologic parameters obtained from complete blood counts (CBCs) may play in the early diagnosis of testicular torsion (torsion) versus acute epididymo-orchitis (epididymitis) in acute scrotum patients. They retrospectively compared hemoglobin concentration, mean corpuscular volume (MCV), white blood cell (WBC) count, platelet, neutrophil, lymphocyte and monocyte counts (PLC, NC, LC, MC), platelet distribution width (PDW), mean platelet volume (MPV), neutrophil ratio, lymphocyte ratio, monocyte ratio, neutrophil-to-lymphocyte ratio (NLR) and platelet-to-lymphocyte ratio (PLR) between 131 patients with torsion and 119 with epididymitis both before and after 6 hours of symptoms. They found that within 6 hours of symptoms, an MPV of 9.35 femtoliters (fL) was predictive of torsion (versus 8.53 fL in epididymitis), with an area under the receiver operating curve (AUC) of 0.855—with differences also being found between neutrophil count (7.72×10^3 versus 5.97×10^3 /cells μ L), neutrophil ratio (69.85% versus 59.33%), NLR (2.57 versus 5.17) and PLR (106.2% versus 141.37%). Even though WBC, neutrophil count, monocyte count and MPV were also predictive of orchiectomy on univariate analysis, they were eclipsed by symptom duration in their multivariate model.

This article is the most recent link in a chain of studies investigating whether parameters routinely obtained through an inexpensive CBC could improve the differential diagnosis of acute scrotum cases, and eventually anticipate the fate of the organ in testicular torsion patients. One of the first studies of this chain comes from Baskent,

Turkey (2)—their 27th reference. Cicek *et al.* retrospectively compared 50 torsion patients with 50 controls, and found higher MPV among the former (8.3 ± 1.2 versus 7.1 ± 0.8 fL). Moreover, they observed that with a MPV cutoff value of 7.7 fL the AUC equaled 0.8 (sensitivity = 62%, specificity = 96%). Researchers from China (3)—reference 28 in the paper—compared 58 pediatric testicular torsion patients with 54 age-matched controls and uncovered that, in addition to symptom duration and magnitude of torsion, only MPV was predictive of orchiectomy (odds ratio = 3.69).

These findings, however, were not reproduced in another 2015 Turkish study (4)—the 19th reference of the paper—that compared 75 torsion patients with 56 controls. Instead of MPV, they found that larger NLR (3.61 versus 1.82), PLR (137.7% versus 94.7%) and platelet counts (257.10^3 versus 190.10^3 plt/ μ L) were predictive of torsion. The use of a 2.95 NLR cutoff value resulted in a sensitivity of 84% and specificity of 92% (ROC curves were provided as figures but we could not find the AUC values). Together with symptom duration, a higher NLR (mean 4.81 versus 2.72) was also predictive of testicular salvage in a Korean study (5) (the 7th reference in the article).

A more clinical valuable comparison was the subject of yet another retrospective Turkish study (6)—the article's 12th reference. These workers compared CBC parameters between 51 torsion and 50 epididymitis patients, as well as with 52 controls, and found that although MPV did not discriminate between torsion and epididymitis patients, the median PLR was higher in epididymitis patients: 177 versus 110.7 (torsion) and 111.5 (controls), as also was the

NLR: 5.5 versus 4.4 (torsion) and 2 (controls). MPV also failed to distinguish between torsion and epididymitis in a retrospective study conducted by Yucel and Ozlem Ilbey (7) (reference 13 in the paper). Instead, they observed that PLR (cutoff 135.58, AUC 74.1%), monocyte-to-eosinophil ratio (cutoff 4.5, AUC 79.3%) and above all NLR (cutoff 3.39, AUC 87.2%) were better at differentiating between torsion and epididymitis. Given these conflicting results, one would hope that a systematic review and meta-analysis could be able to shed some light on this issue. Zhu *et al.* (8) were able to retrieve retrospective case-control studies (four of them already mentioned in this comment) and concluded that MPV, PLR and NLR may be useful to distinguish between torsion and epididymitis, whereas leucocyte counts most likely are not.

At this point in time, we have amassed enough data to progress from hypothesis-generating to hypothesis-proving/refuting research. As it seems possible that the thrombotic, ischemic and inflammatory events that follow torsion are reflected in WBCs and platelet count and morphology, we should be able to prospectively determine the diagnostic (with respect to epididymitis) and prognostic (regarding testicular salvage) value of these rather unspecific (9) CBC parameters. Since surgical outcomes in torsion patients are heavily dependent upon early diagnosis, often made by non-urologists (10,11), we are particularly curious whether one or more of these hematologic parameters could improve accuracy to existing diagnostic tools, such as the TWIST (12) and BAL (13) scores.

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Footnote

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appropriately investigated and resolved.

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