

## The effect of red cell distribution width on mortality in partial hip replacement surgery

Dear Editor,

In a recent issue of *Acta Orthopaedica et Traumatologica Turcica*, we read with great interest the article by Zehir et al. entitled 'Red cell distribution width and mortality in patients with hip fracture treated with partial prosthesis'.<sup>[1]</sup> They evaluated the outcome of patients with hip fracture treated with partial hip replacement, and investigated the relationship between red cell distribution width (RDW) and mortality in patients who underwent partial hip replacement surgery. They concluded that there was a significant correlation between elevated RDW level and mortality. We believe that these findings will act as a guide for further studies, and we thank the authors for their contribution to the literature. However, we think that some points should be discussed.

As a parameter, RDW is provided by automated hematology analyzers and reported as a component of complete blood count. It is reported as an index of heterogeneity in size of circulating erythrocytes.<sup>[2]</sup> Some studies have reported that higher RDW levels are associated with poor prognosis in coronary bypass surgery, peripheral arterial disease, stroke, heart failure, and in elderly subjects.<sup>[3]</sup> RDW levels may also reflect nutritional deficiencies (i.e. iron, vitamin B12, and folic acid), ethnicity, neurohumoral activation, inflammatory diseases, recent transfusion, renal and hepatic dysfunction, thyroid disease, bone marrow dysfunction, chronic or acute systemic inflammation, and the use of some medications.<sup>[4–7]</sup> Patients having these conditions are usually excluded from the studies about the prognostic and predictor value of RDW.<sup>[2]</sup> Hence, it would be better if the authors of this study had defined all of these factors in their study group.

In conclusion, elevated RDW levels in elderly patients with hip fracture who receive a partial prosthesis may be associated with mortality, as presented in the current study. It has been shown that each 1-point increase in RDW level was related to an increase in 1-year mortality in hospitalized patients.<sup>[8]</sup> However, this may be affected by many factors, and hence, RDW level itself without other parameters may not provide sufficient information to clinicians on the mortality risk in patients

treated with partial hip replacement surgery. We believe that these findings will act as a guide for further studies that will show the association between RDW and mortality in patients with hip fracture treated with partial prosthesis.

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## Authors' reply

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Red blood cell distribution width is one of the main parameters in whole blood count assay and is used in the differential diagnosis of anemia. Numerous recent studies have concluded that there is a direct relation between RDW and the mortality rate of many disease states.<sup>[1]</sup> In fact, higher RDW values have been found to be associated with a higher mortality rate in the general population.<sup>[2]</sup> While a direct relationship between the mechanism of high RDW levels and mortality rate in these diseases has not been identified, it is suspected in other parameters such as chronic inflammation in erythrocytes, low levels of nutrition, and patient age. Multivariate analyses have shown that the pathophysiology leading to increased RDW may affect outcomes in acute and chronic disease states, irrespective of anemia status. RDW seems to serve as an integrative marker of multiple pathological processes.<sup>[3]</sup> This may explain why RDW values correlate with disease severity and are associated with prognosis. RDW is a readily available and inexpensive test for hip fracture surgery patients. It may provide clues to mortality and prognosis while patients are still in the emergency room. We suggest that, in the

future, RDW may be included in a combined model for risk stratification of patients with hip fracture.

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