Background Red blood cell distribution width (RDW) has been shown to be an independent predictor of mortality in patients with coronary artery disease and in patients with heart failure. However, there are limited clinical studies about the prognostic value of RDW in patients with coronary artery disease (CAD) undergoing percutaneous coronary intervention (PCI). We aimed to examine the association between RDW on admission and the risk of all-cause mortality in patients with CAD undergoing PCI.

Methods We analysed RDW values on admission in 800 consecutively adult patients, who were admitted to our hospital undergoing PCI for CAD. In all patients, a baseline blood sample was collected for routine haematological testing, at the same time the plasma level of high-sensitivity C-reactive protein (hsCRP), erythrocyte sedimentation rate (ESR) and B-type natriuretic peptide (BNP) were tested as well; patients who were anaemic at baseline were excluded. All patients were followed prospectively for all-cause mortality.

Results After a median follow-up of five (IR 4.6–5.6) years, there were a total of 48 (6%) deaths. RDW was analysed as a categorical variable with empirically determined cut points of 13.2 and 14.5 (low RDW <13.2, medium RDW >=13.2 to <14.5, high RDW >=14.5) based on differences in HR for death among RDW deciles. In univariate analysis, higher RDW was a significant predictor of mortality (p<0.01), HR for death in patients with high RDW relative to low RDW was 5.1 (95% CI (CI): 2.0 to 13.0). In the high RDW group, the values of hsCRP, ESR and BNP were higher than that in the low or medium group (p<0.05).

Conclusions As RDW is widely available to clinicians as a part of the complete blood cells count, and therefore incurs no additional costs. Higher RDW might be a strong and independent predictor of long-term mortality in patients undergoing PCI who were not anaemic at baseline. Neurohumoral activation may be a mechanistic link between increased RDW and adverse events in patients with CAD undergoing PCI.