

Incremental Value of White Blood Cell Subtypes for 10-years Risk Stratification Following Acute Myocardial Infarction

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Background:

White blood cells (WBC) count and differential provide an inflammatory associated with outcome following acute myocardial infarction (AMI). We comprehensively and comparably investigated the predictive ability of WBCs and its subtypes for long-term mortality after AMI, adjusted for the Soroka Acute Myocardial Infarction (SAMI) Score.

Methods:

Consecutive patients, discharged with the diagnosis of AMI were included. Patients were excluded due to clinical evidence of cancer, chronic inflammatory diseases and systemic infections. Total WBC count and subtypes, performed within 72 hours following admission were retrospectively obtained and divided into quartiles. Follow up periods were 1-, 5- and 10 years post AMI. The primary outcome was all-cause mortality. The relationships between WBCs counts and mortality, adjusted for risk factors (SAMI score), were assessed using generalized estimating equation (GEE) models.

Results:

A total of 2,129 patients were studied. Mean age was 65.3 ± 13.5 , 69% were male. A total of 5,461 WBC count and differential tests were performed. In a univariable analysis significant linear association between Lymphocytes and inverse linear associations (Neutrophils and Neutrophils/lymphocytes ratio (NLR)) and long-term mortality were found. Significant non-linear associations between Basophils (reversed-J-/ U-shaped), Eosinophils (reversed-J-/ U-shaped), Monocytes (U-shaped), WBC (U-shaped) and mortality were found. In a multivariable analysis Lymphocytes (strongest), NLR and Eosinophils were independent predictors of mortality for 1 up to ten years post discharge, and modestly improved the prognostic ability of the SAMI model. The prediction ability diminished as follow up period increased.

Conclusions:

NLR, Lymphocytes (strongest) and Eosinophils are inexpensive, universally available markers of post AMI mortality with incremental prognostic ability to the SAMI score that diminishes as follow up period increases.