Original article **UDC: 616.155.16:616.61-78-036.8**
doi:10.5633/amm.2020.0101

PREVALENCE AND DETERMINANTS OF HEMOGLOBIN VARIABILITY AND ITS IMPACT ON MORTALITY IN PATIENTS ON MAINTENANCE HEMODIALYSIS

Zorica Dimitrijević[1,2], Branka Mitić[1,2], Karolina Paunović[1], Sonja Šalinger-Martinović[2]

[1]Clinic of Nephrology, Clinical Center Niš, Niš, Serbia
[2]University of Niš, Faculty of Medicine, Niš, Serbia

Contact: Zorica Dimitrijević,
Njegoševa 52, 18000 Niš, Serbia
E-mail: zorica_mdimitrijevic@yahoo.com

Treatment with erythropoiesis-stimulating agents (ESA) is the optimal therapy for renal anemia. However, maintaining hemoglobin (Hb) within narrow targets remains a significant clinical problem because during ESA treatment, the Hb levels usually fluctuate widely; this phenomenon is termed "hemoglobin variability" and is associated with higher mortality. Our study aimed to determine the prevalence and cause of hemoglobin variability in patients on chronic hemodialysis (HD) treatment and to estimate the association of Hb variability with all-cause mortality.

A prospective study was conducted on 193 chronic HD patients treated with ESA. Hemoglobin cycling was defined as Hb variability throughout at least eight weeks and amplitude of more than 1.5 g/dl from the Serbian target range of 10-11 g/dl.

During the one-year follow-up, there was 5.6 ESA dose modification per patient. 23.4% of patients had never experienced Hb cycling during the study period. The total number of 460 hemoglobin excursions were recorded in 76.6% of patients, with 2.42 ± 2.7 Hb excursions per year, mean amplitude of 2.13 ± 0.76 g/dL, and the average length of Hb excursion of 8.2 ± 2.7 weeks. The Hb cycling was not affected by the gender, age, weekly ESA dose, or the presence of diabetes or hypertension. However, Hb variability was associated with ESA dose change, CRP, and HD vascular access type. The odds ratio for 1-year all-cause mortality was 1.424 (95% CI: 1.231–1.682, $P < 0.001$).

Hemoglobin cycling frequently occurs in ESA treated HD patients as a result of current practice in ESA dosing, the presence of infection, and the type of vascular access for HD and these fluctuations predicted overall mortality.

Acta Medica Medianae 2020;59(1):05-13.

Key words: *hemoglobin variability, erythropoiesis-stimulating agents, hemodialysis*