INTRODUCTION AND AIMS: Although arteriovenous fistula (AVF) dysfunction is a major cause of hospitalization and morbidity in hemodialysis (HD) patients, detailed pathogenesis of AVF complications such as stenosis and thrombosis is still under investigation. Leukocytes have been shown to play an important role in the development of AVF stenosis. Nevertheless, prior reports have focused on cells on monocyte lineage, and little is known about the possible role of neutrophils. We aimed to evaluate the association between the degree of AVF stenosis and neutrophil activation status by measuring circulating levels of elastase and lactoferrin. Also, we tried to find out the role of angiogenin, which was known as neutrophil degranulation inhibitory protein, in the degree of AVF stenosis.

METHODS: We examined circulating levels of elastase, lactoferrin and angiogenin as well as other clinical and biochemical parameters in 54 patients who received HD with native AVF for more than 3 months. Degree of AVF stenosis was expressed by the percent of the greatest stenotic diameter to the widest adjacent vessel diameter by ultrasound.

RESULTS: Circulating elastase and lactoferrin levels were strongly correlated with each other (r=0.809, p=0.000). The degree of AVF stenosis was positively correlated with elastase (r=0.278, p=0.042) and lactoferrin (r=0.282, p=0.039) levels. However, there was no significant correlation between the degree of AVF stenosis and angiogenin level. Patients with severe AVF stenosis (stenosis > 50%) were older (67.9±8.3 vs 57.2±4.3 yrs, p=0.007), had longer dialysis vintage (7.0±4.0 vs 4.3±4.0 yrs, p=0.027), duration of AVF use (6.9±4.0 vs 3.8±3.5 yrs, p=0.008), and higher elastase (414.9±294.5 vs 228.0±134.5 ng/ml, p=0.027), lactoferrin (11.9±6.5 vs 6.2±3.0 ng/ml, p=0.004) levels compared with the other group. There was no significant difference in gender, presence of diabetes, angiogenin levels, and other biochemical measurements including hsCRP, calcium, phosphorus, IPTh, cholesterol according to the degree of AVF stenosis. In multivariable analysis, however, only age and duration of AVF use were significant independent predictors for the degree of AVF stenosis.

CONCLUSIONS: Circulating levels of lactoferrin and elastase, indirect markers of neutrophil activation, were closely associated with the degree of AVF stenosis. Larger scale studies are needed to show whether they could be used as independent predictors of at-risk AVF stenosis.