

Impact of body composition responsiveness to erythropoiesis-stimulating agent in chronic hemodialysis

중앙대학교병원 내과¹

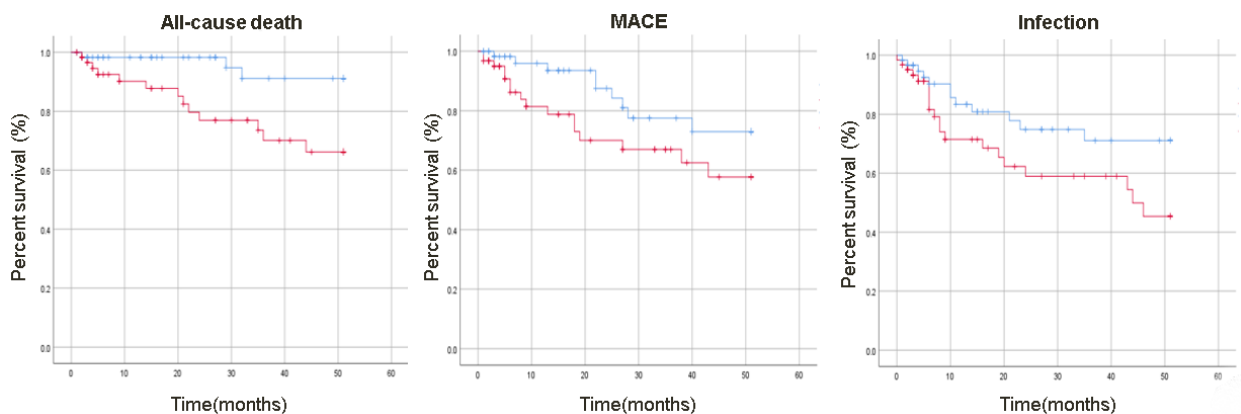
김홍태¹, 신정호¹

Background/Aims: Erythropoietin resistance index seems to be associated with adverse outcomes in patients receiving chronic hemodialysis. Despite the role of erythropoietin in non-hematopoietic tissues, such as skeletal muscle or fat, there is lack of clinical studies showing the impact of body composition on responsiveness. The aim of this study was to examine association of body composition with ERI using longitudinal data in patients on chronic hemodialysis.

Methods: This study included outpatients on chronic hemodialysis who received body composition analysis, performed every 6 months. The ERI was calculated by dividing the weekly body weight-adjusted erythropoietin dose by the hemoglobin concentration, and the values were averaged every 3-month period. Relationship between body composition and baseline ERI was evaluated in the multiple linear regression analysis, and the trend of ERI over time according to changes in body composition was analyzed using a linear mixed effect model.

Results: There were 65(52.8%) men, 58(47.2%) women, and followed up for 24 months. Subjects with higher mean ERI during study period had the increased risks for all-cause death, cardiovascular events, infection requiring hospitalization, compared to lower mean ERI ($P=0.009$, 0.076 , and 0.051). Linear regression analyses found that ERI was negatively correlated to body mass index, percent body fat, arm circumference, arm muscle circumference, and visceral fat area ($P=0.067$, 0.065 , 0.002 , 0.021 , 0.040). However, ratio of extracellular water to total body water and skeletal muscle mass index was not related to ERI. Longitudinal trend of ERI was assessed according to slope of body composition parameters over time. Increase in ERI was associated with increase in ratio of extracellular water to total body water ($P=0.007$), the trajectory of ERI was inversely proportional to changes in arm circumference, arm muscle circumference, visceral fat area over time ($P=0.002$, $P<0.001$, $P=0.026$).

Conclusions: Erythropoiesis-stimulating agent responsiveness may be associated with body composition, especially with arm circumference, arm muscle circumference and visceral fat area. Therefore, body composition analysis can be useful to predict ERI in patients receiving chronic hemodialysis.



		P
BMI	-0.445	0.067
PBF	-0.141	0.065
AC	-0.899	0.002
AMC	-0.876	0.021
VFA	-0.038	0.040
SMI	-0.317	0.710
ECW/TBW	0.291	0.564

<Table 1> The relationship between the ERI and body composition

		P
BMI	-0.125300	0.309
PBF	-0.037717	0.192
AC	-0.275401	0.002
AMC	-0.370708	<0.001
VFA	-0.014101	0.026
SMI	-0.012316	0.960
ECW/TBW	0.432408	0.007

<Table 2> The trend of ERI according to longitudinal changes in body composition