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Changes of hemoglobin level and erythropoietin stimulating agent dose after mid-week predialysis blood sampling

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Objectives : Hemoglobin (Hb) variability is frequently observed in end stage renal disease (ESRD) patients. There have been many discussions over true functional Hb in ESRD patients without any confirmative conclusion. Optimal dosing of ESA based on true Hb level is important, because high dose ESA is known to be related to poor outcomes with increased health care expenditure. We investigated changes in Hb level and erythropoietin stimulating agent (ESA) dose depending on the change of Hb measurement day in maintenance hemodialysis (HD) patients

Methods : The day for predialysis Hb measurement was changed from days after long interdialytic period (Monday or Tuesday) to midweek days (Wednesday or Thursday) in Asan Medical Center in September 2013. We reviewed baseline clinical characteristics, laboratory data including Hb, dose of ESA, dose of intravenous (IV) iron, and parameters related to HD for two years before and after the change of Hb measurement day in 92 patients receiving maintenance HD.

Results : Mean age of patients was 61.6 ± 12.1, and diabetes mellitus was the leading cause of ESRD (52.2 %). Mean Hb level was 10.71 ± 0.06 g/dL a year before the change of Hb measurement day, 10.78 ± 0.47 g/dL a year after the change ($p=0.105$). Mean ESA dose was 175.36 ± 72.47 μg darbepoietin alfa per month, 163.65 ± 83.95 μg per month, before and after the change, respectively ($p=0.022$). Mean IV iron dose was 6.32 ± 4.89 ample (100 mg Fe3+/1 ample) iron hydroxide sucrose per year, 4.47 ± 5.02 ample per year, before and after the change, respectively ($p<0.001$). Mean interdialytic weight gain was 2.81 ± 0.82 kg, 1.99 ± 0.61 kg, before and after the change, respectively ($p<0.001$). The number of patients without achievement of target Hb requiring higher dose of ESA was decreased from 8 to 2, before and after the change respectively.

Conclusions : Significant decrease in the ESA and IV iron dose was observed without change in Hb level after midweek predialysis Hb measurement. Midweek

predialysis Hb level would be better criterion for ESA dosing.

Keywords : End stage renal disease; hemoglobin; erythropoietin stimulating agent