METHODS: A total of 407 patients (249 males and 158 females) in our dialysis database enrolled in the study. The prognostic factors for all-cause death (ACD) and cardiovascular death (CVD) were extracted from background factors, including time-averaged mean corpuscular volume, mean corpuscular hemoglobin concentration (MCHC), transferrin saturation and ferritin, using Cox regression model. In the cause of death extracting IDrF as a prognostic factor, 407 patients were divided into two groups, the control group and the poor-prognosis group (PPG), based on cut-off value of IDrF. According to calculated propensity score on IDrF for category of PPG, patients were extracted by 1:1 matching from each group. Their survival analysis was estimated by the Kaplan-Meier method, and a log-rank test was used to examine the differences between the survival curves.

RESULTS: Among IDrF, MCHC was extracted as a predictor on ACD and CVD. The cut-off value of MCHC for PPG was below 31.7% and a total of 96 matched pairs was extracted from the entire cohort using propensity score matching (c-statistic 0.83, \( p < 0.0001 \)). There was no significant difference in matching covariates except hemoglobin between the two groups. During observational period of 11 years, 71 patients died, among that 42 were cardiovascular death. The survival curves on ACD and CVD in the group with less than 31.7% of MCHC showed significantly poor prognosis.

CONCLUSIONS: This study indicated that renal anemia in dialysis patients would be treated maintaining MCHC above 31.7% to improve their prognosis on both ACD and CVD.

THE COST-UTILITY OF TREATING ANEMIA WITH CONTINUOUS ERYTHROPOIETIN RECEPTOR ACTIVATOR OR EPOETIN VERSUS ROUTINE BLOOD TRANSFUSIONS AMONG CHRONIC HEMODIALYSIS PATIENTS

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INTRODUCTION AND AIMS: The purpose of this study was to determine the cost-utility of treating dialysis patients with a long acting erythropoiesis stimulating agents (ESAs) : continuous erythropoietin receptor activator (CERA) once monthly or a short acting ESA: Epoetin Beta (EpoB) thrice weekly compared with a strategy of managing anemia without ESAs.

METHODS: We estimated the cost per quality-adjusted life-year (QALY) gained with treatment using CERA or EpoB to maintain hemoglobin level within the range 10.5-12 g/dL, compared with a strategy of managing anemia without ESAs. A decision analytic model was constructed to model costs and clinical outcomes in a cohort of chronic hemodialysis patients (CHP). In our analysis, we adopted the perspective of the National health care payer for a time horizon of 1 year. For CERA and EpoB, we considered direct medical cost including ESA acquisition cost, iron usage, and hospitalization. For RBCT, we based our estimation on the hospital cost of one unit of transfused filtered red blood cells, including compatibility testing, cross-matching, and the infusion in day hospital. In order to calculate costs, QALYs and increments associated with CERA, EpoB, and RBCT alone, the analysis model was constructed in TreeAge Pro 2015 (TreeAge Software). Key model inputs included for CERA, EpoB, and RBCT; medical costs, survival, and utilities depending on Hb levels. Model outputs were expected cost-utility ratio and the incremental cost-utility ratio (ICUR), which represent the additional cost and utility obtained, when CERA or EpoB is compared with the RBCT regime. Probabilistic sensitivity analysis was conducted by a Monte Carlo simulation; to better test the overall uncertainty in our model.

RESULTS: The total cost per patient (in US$) was estimated at 2,176.37$, 4,107.01$ and 4,356.69$ for RBCT, CERA, and EpoB, respectively. The cost-utility ratio was calculated at 4,423.52, 6,955.50, and 7,406.38 $/QALY for RBCT, CERA, and EpoB, with an ICUR of CERA and EpoB in relation to RBCT at 19,606.40 and 22,466.09 $/QALY, respectively. In sensitivity analysis, the model was most sensitive to hospitalization costs, hospital stay, and annual number of RBCT units. Also, assuming utility and survival improvement with erythropoiesis stimulating agents use resulted in a decrease in ICUR at 13,429 $/QALY for CERA and 15,331 $/QALY for EpoB. In probabilistic sensitivity analysis, the main results of our model were unchanged; CERA and EpoB were more costly and more effective than RBCT below a threshold of 19,500 $/QALY. CERA was the best option for a willingness to pay over 19,500 $/QALY.

CONCLUSIONS: Our study suggests that managing anemia in dialysis patients with CERA or EpoB may result in better outcomes with higher overall costs. Considering different assumptions, we found substantial variability in the estimates of the cost-utility and incremental of using CERA or EpoB.