

## Relationship between therapeutic response to erythropoietin and implementation of serum ferritin monitoring, gastrointestinal work-up for occult bleeding and iron supplementation

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### Abstract :

**Objective** — Criteria of drug use evaluation (DUE) for the treatment of anemia in hemodialysis patients with recombinant human erythropoietin (r-HuEPO) include monitoring of serum ferritin concentrations, gastrointestinal work-up for occult bleeding and adequate iron supplementation (Bennett et al., Clin Pharm 1991). However, it remains to be determined whether the implementation of these criteria would confer better therapeutic responses or less adverse drug reactions.

**Design** — Retrospective observational study at a teaching hospital.

**Methods** — Clinical and laboratory data were retrieved from 112 patients with end-stage renal disease who received r-HuEPO during hemodialysis therapy at Kitasato University Hospital. Those with hemolysis, active liver diseases, active inflammatory diseases or malignant diseases or those given blood transfusion were excluded from the analysis (n = 53). Implementation of serum ferritin monitoring, gastrointestinal work-up for occult bleeding (e.g., fecal occult blood test, endoscopy) or iron supplementation were evaluated within each of the three consecutive 2-week intervals (Periods I, II and III) after the commencement of the r-HuEPO therapy. A rank score of 1 was given if any of the above criteria was satisfied, and the sum of the scores at the respective study periods were calculated accordingly. Correlation between the sum of the scores obtained at the respective study periods obtained from the patients and their erythropoietic responses defined as the difference between the baseline and maximum hemoglobin concentration (i.e.,  $\Delta$ Hb) were studied. Regarding safety and economical consideration, the monitoring scores for patients developing hypertension and those not were compared and the cumulative r-HuEPO doses for attaining hemoglobin concentration of 8.0 g/dL obtained from patients having different monitoring scores were compared.

**Results** — The patients given the highest score (i.e., 3) at Period I possessed the mean  $\Delta$ Hb (1.9 $\pm$ 1.3 g/dL) that was significantly ( $p < 0.05$ ) greater than those given the scores of 2 and  $\leq 1$  (0.9 $\pm$ 0.9 and 0.2 $\pm$ 1.8 g/dL, respectively). Multiple regression analysis showed that both monitoring of serum ferritin and iron supplementation were associated significantly ( $p < 0.01$ ) and independently with greater erythropoietic responses. No correlations were found between the monitoring scores and development of hypertension or cumulative doses of r-HuEPO.

**Conclusion** — The present study indicates that clinical practice satisfying the DUE criteria for r-HuEPO might confer more favorable erythropoietic responses.

**Key Words** : anemia, hemodialysis, r-HuEPO, serum ferritin concentration, iron supplementation