

LOW LEVELS OF SERUM FERRITIN WITH MODERATE LEVEL OF TRANSFERRIN SATURATION MAINTAINS ADEQUATE HEMOGLOBIN IN HEMODIALYSIS PATIENTS

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INTRODUCTION AND AIMS

Control of iron storage is an important therapeutic measure for anemia in hemodialysis (HD) patients. The required amount of iron increases in erythropoiesis stimulating agents therapy. However, excess iron induces the production of hepcidin25 (Hep25), thereby reducing the efficiency of iron utilization. Thus, the optimal iron status for anemia control in HD patients remains unclear. In order to clarify the appropriate iron status in recombinant human erythropoietin (EPO) therapy, we investigated the relationships among serum ferritin (s-ft), transferrin saturation (TSAT), and the data associated anemia.

METHODS

112 outpatients on maintenance HD were followed for 5 years. We measured hemoglobin (Hb) level twice a month, and s-ft and TSAT monthly. EPO and low-dose iron supplement were adjusted to maintain a Hb level of 10-11 g/dL, according to Japanese guidelines. We used the mean data of every one year for analysis. The data for five years were categorized into five groups by mean s-ft and TSAT of each year as follows: **group 1 (G1; s-ft ≥ 100 ng/mL, TSAT $\geq 20\%$), group 2 (G2; s-ft ≥ 60 ng/mL, TSAT $< 20\%$), group 3 (G3; $60 \leq$ s-ft < 100 ng/mL, TSAT $\geq 20\%$), group 4 (G4; s-ft < 60 ng/mL, TSAT $\geq 20\%$), group 5 (G5; s-ft < 60 ng/mL, TSAT $< 20\%$).**

Moreover, Hep25 was measured by LC-MS/MS assay on the one point during this study, and divided into group 1-5. Hb level, the data associated anemia, erythropoietin resistance index (ERI; average weekly erythropoietin dose [IU] / Hb [g/dL] / kg body weight), and Hep25 were compared among the groups. One-way analysis of variance and the Kruskal-Wallis test H-test were used for analysis. The interaction among the Hb level, s-ft, and Hep25 was analyzed using a linear regression model.

RESULTS

We showed the summarizing data in Figure 1 and 2.

Tab. 1. Baseline characteristics

Age(yerars)	54.7±10.8
HD duration (years)	9.2±6.5
Men(%)	60.7
Diabetes (%)	13.4
Kt/V (single pool)	1.34±0.21
s- Alb (g/dL)	3.9±0.3
CRP * (mg/dL)	0.1 [0.1-0.2]

Tab. 2. The data of s-ft and TSAT by groups

group	s-ft * (ng/mL)	TSAT (%)
G1	157.0 [124.2-207.8]	27.0±5.0
G2	114.0 [87.5-166.6]	17.0±2.2
G3	78.5 [70.6-88.0]	26.1±4.3
G4	30.5 [21.7-41.4]	25.2±3.9
G5	21.7 [14.6-34.4]	15.2±2.9

*:median[interquartile range] (mean±SD)

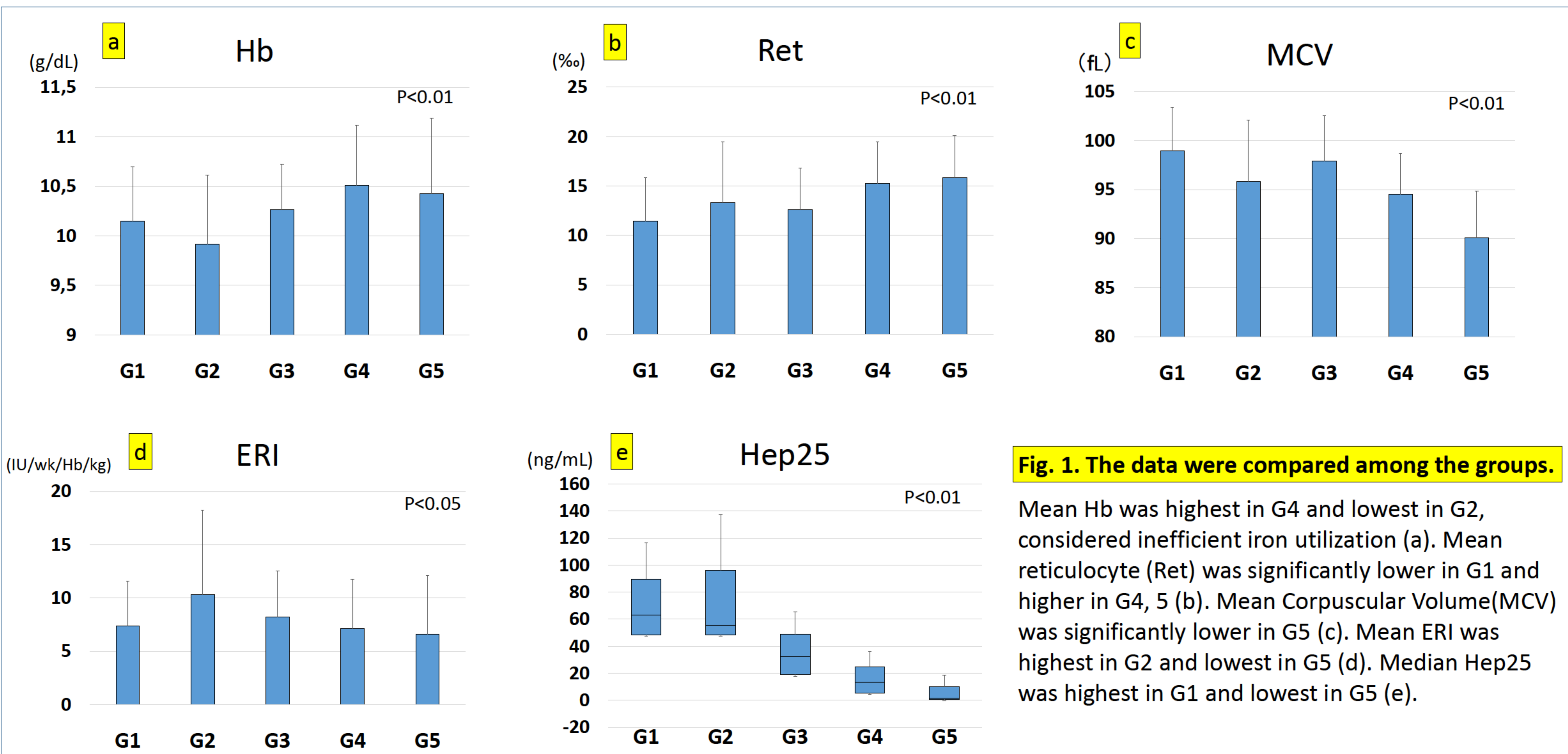


Fig. 1. The data were compared among the groups.

Mean Hb was highest in G4 and lowest in G2, considered inefficient iron utilization (a). Mean reticulocyte (Ret) was significantly lower in G1 and higher in G4, 5 (b). Mean Corpuscular Volume(MCV) was significantly lower in G5 (c). Mean ERI was highest in G2 and lowest in G5 (d). Median Hep25 was highest in G1 and lowest in G5 (e).

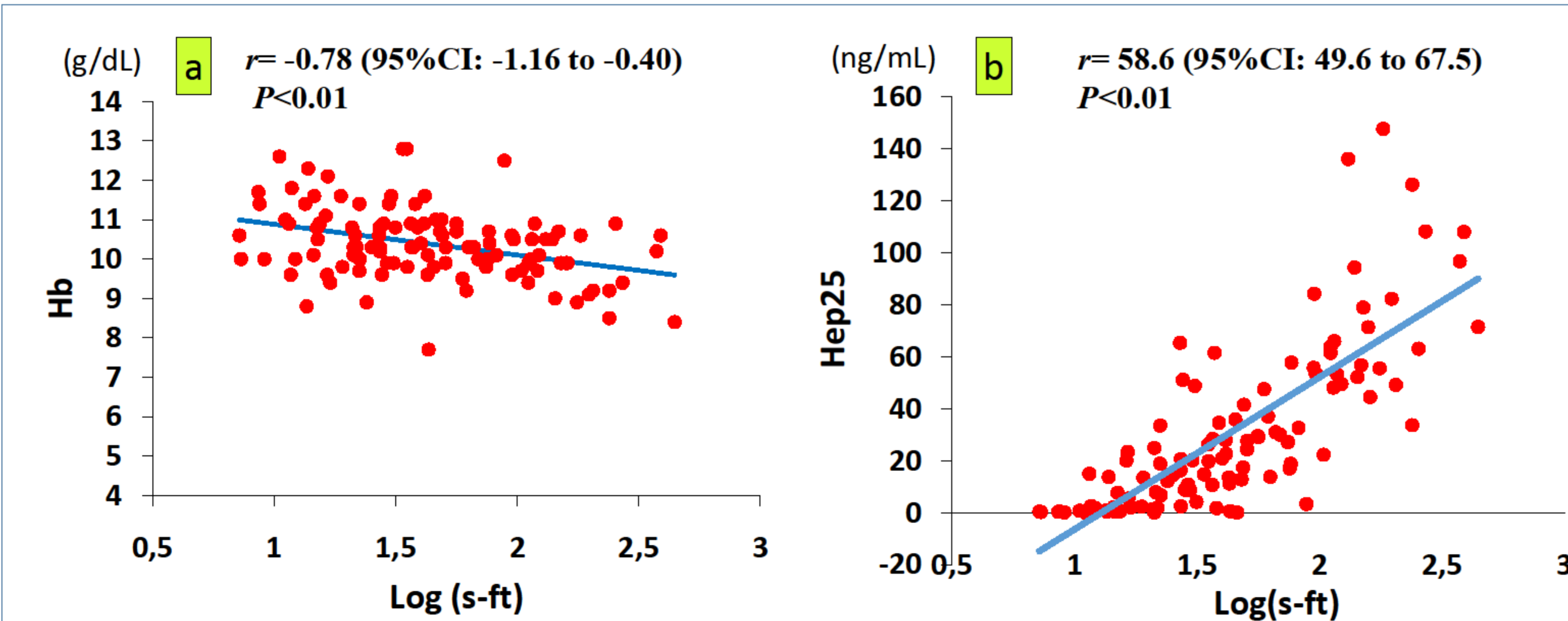


Fig. 2. Linear regression models

s-ft was correlated negatively with Hb(a) and positively Hep25(b) with in HD patients. s-ft had a strong effect on Hb and Hep25.

CONCLUSIONS

Our data indicated that low s-ft and moderate TSAT associated with adequate Hb and the iron efficiency was important factor for anemia control in HD patients. This study also showed that Hep25 rose sensitively and Hb level decreased as increasing of s-ft. The optimal iron status might be lower than that of established guideline for anemia control of HD patients. We reported on the last this congress that low levels of s-ft are associated with good prognosis on hemodialysis patients. And there seems to be close relationship in optimal iron status between efficient erythrocytosis and prognosis.

