EFFECT OF SUCROFERRIC OXYHYDROXIDE ON FIBROBLAST GROWTH FACTOR 23 IN HEMODIALYSIS PATIENTS

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BACKGROUND

Elevated fibroblast growth factor 23 (FGF23) level in hemodialysis patients is associated with mortality. Ferric citrate hydrate decreases FGF23 level in both non-hemodialysis and hemodialysis patients. Previous studies found that treatment with intravenous saccharated ferric oxide increased serum FGF23 level in hemodialysis patients. Sucroferric oxyhydroxide is a novel phosphate binder introduced in December 2015 in Japan.

OBJECTIVE

This study sought to investigate the effect of sucroferric oxyhydroxide on FGF23, and reduced dosage of erythropoiesis stimulating agents (ESA) and intravenous saccharated ferric oxide.

METHODS

This was a prospective, open-label, single-arm, single-center trial involving patients won lanthanum carbonate hydrate who received sucroferric oxyhydroxide 750 mg daily instead of lanthanum carbonate hydrate. The dose was adjusted every 2 weeks as usual, up to a maximum of 3,000 mg daily if serum phosphate level was not within 3.5 – 6.0 mg/dL. Patients were withdrawn from the study if any adverse events occurred. The dosage of calcium carbonate, vitamin D receptor activators, and cinacalcet were maintained during the study. Patients were monitored for 24 weeks. We evaluated changes in the levels of hemoglobin (Hb), serum phosphate, FGF23, iron, and ferritin, as well as transferrin saturation (TSAT), dosage of intravenous saccharated ferric oxide and ESA (recombinant human erythropoietin: rHuEPO), and erythropoietin responsiveness index (ERI = weekly ESA dose (units)/dry weight (kg)/hemoglobin (g/dL)).

RESULTS

A total of 41 patients were included, 13 patients were withdrawn from the study and 28 patients were analyzed (**Fig. 1**). Baseline patient characteristics and medications are shown in **Table. 1** and **2**. The final mean dose of sucroferric oxyhydroxide was 955 mg daily. Serum phosphate was well controlled (**Table. 3**). Mean FGF23 level decreased significantly from 11,383 pg/mL at baseline to 6,543 pg/mL at the end of the study (P = 0.01) (**Fig.2**) . Serum iron and Hb levels, dosage of ESA, and ERI did not change significantly at the endpoint. TSAT and ferritin markedly increased (P = 0.001 and P = 0.001, respectively), and dosage of intravenous saccharated ferric oxide was reduced significantly compared to baseline (P < 0.01) (**Table. 4**). Of the 13 patients withdrawn from the study, 11 were withdrawn due to diarrhea (n = 4), pruritus (n = 1), the taste of the medicine (n = 4), and increased water intake (n = 2). Two patients were admitted to hospital due to arteriosclerosis obliterans and malignant lymphoma apparently unrelated to the administration of sucroferric oxyhydroxide. No serious adverse drug reactions were recorded.

Fig. 1 Study flow chart

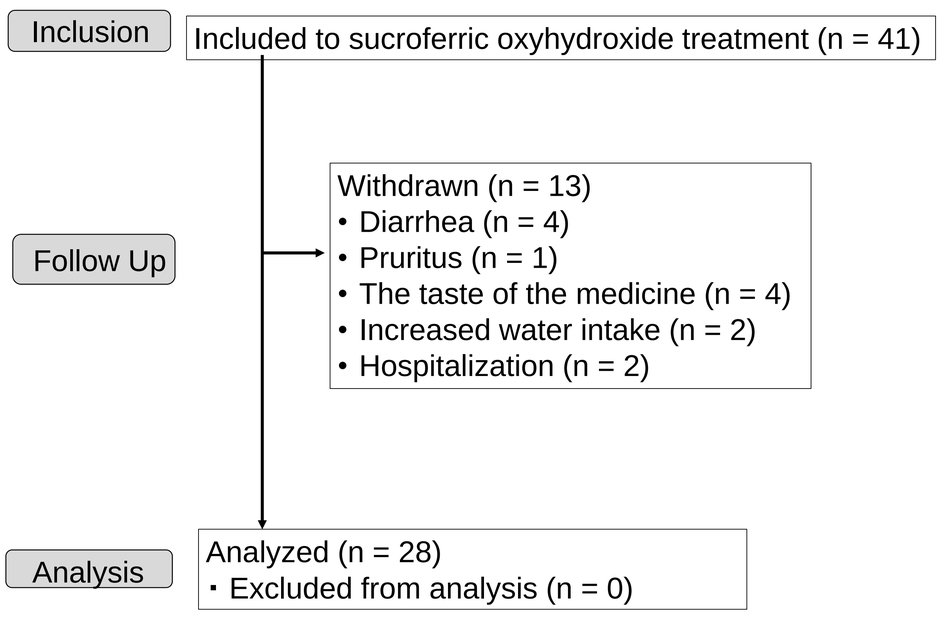

Table.1 Patient characteristics at baseline

n (men/women)	28 (21/7)
Age (years)	59.5 ± 11.8
Cause of ESKD (n)	
Diabetic nephropathy	11
Polycystic kidney disease	2
Glomerulonephritis	1
Nephrosclerosis	1
Other	4
Unknown	9
Duration of dialysis (years)	3.9 ± 2.9
Dialysis mode (n)	
HD	28
HDF	0
OHDF	0

Values are shown as numbers or mean ± standard deviation.

Table. 2 Medications at baseline

Phosphate binders (mg)	
lanthanum carbonate hydrate	1,384 ± 647
Precipitated calcium carbonate (n = 22)	2,196 ± 1,577
Vitamin D receptor activator (n)	
Alfacalcidol	15
Calcitriol	3
Cinacalcet (n)	7
Saccharated ferric oxide (mg/4W)	66 ± 72
rHuEPO (U/4W)	26,321 ± 14,061

Values are shown as numbers or mean ± standard deviation.

Table.3 Changes in laboratory data

	Baseline	Week 24	P value
Phosphate (mg/dL)	5.82 ± 1.25	5.56 ± 1.58	0.16
Calcium (mg/dL)	8.98 ± 0.41	9.08 ± 0.65	0.229
Intact PTH (pg/mL)	189 ± 151	168 ± 163	0.337
Hb (g/dL)	10.9 ± 0.7	11.2 ± 1.0	0.121
Iron (μg/dL)	58.4 ± 24.1	70.5 ± 25.9	0.067
TSAT (%)	19.8 ± 8.6	28.7 ± 10.1	0.001
Ferritin (ng/mL)	41.2 ± 37.4	105.0 ± 89.4	0.001

Values are shown as mean ± standard deviation.

Fig. 2 Change in Intact FGF23

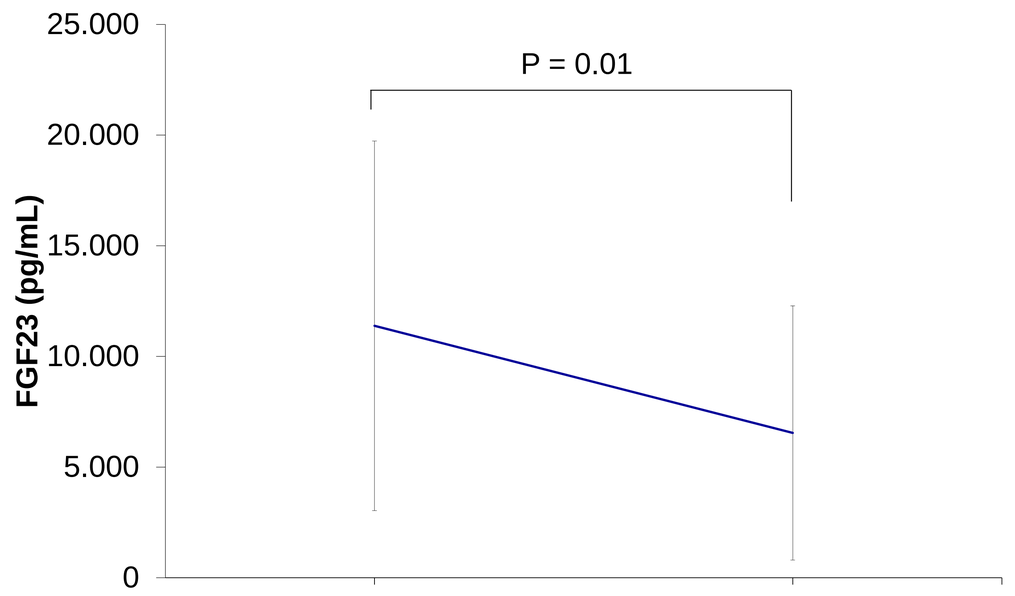

Table.4 Changes in dosage of medications

	Baseline	Week 24	P value
Sucroferric oxyhydroxide (mg)	750	955 ± 354	
Saccharated ferric oxide (mg/4W)	66 ± 72	11 ± 36	0.006
rHuEPO (U/4W)	26,321 ± 14,061	22,179 ± 16,360	0.197
ERI	10.0 ± 5.5	8.3 ± 6.8	0.093

Values are shown as mean ± standard deviation.

CONCLUSIONS

Treatment of hyperphosphatemia with sucroferric oxyhydroxide was effective, resulting in decreased serum FGF23 level in hemodialysis patients as well as reduced dosage of intravenous saccharated ferric oxide.

54 ERA
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Dialysis - Bone disease
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