

Is on-line HDF the best strategy for restless legs syndrome in dialysis patients ?

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Introduction and aims

Restless legs syndrome (RLS) is caused by various etiologies, and it is one of the intractable complications in dialysis patients. Prevalence of RLS in dialysis patients has been reported to be from 12% to 62%. This is much higher compared to 3 to 9% in the general population.

In this study we performed on-line hemodiafiltration (HDF) to treat 7 dialysis patients with RLS. We reported herein that HDF with high removal performance of low-molecular weight protein (LMWP) had a beneficial effect to treat RLS.

Methods

The study involved 131 patients undergoing hemodialysis (HD) or HDF at Hashimoto Clinic.

The diagnostic criteria of the International RLS Study Group were used to determine incidence of RLS.

For the dialysis patients with RLS, dialysis methods were changed and the effects of treatment and removal efficiency of the LMWP were examined.

Removal efficiency was evaluated by measuring
Kt/V for Urea
 β_2 -microglobulin removal rate (β_2 -MG RR)
 α_1 -microglobulin removal rate (α_1 -MG RR)

The severity of RLS was evaluated by using the International Restless Legs Syndrome Rating Scale (IRLS)

IRLS score

mild : 1-10, moderate : 11-20, severe : 21-30, very severe : 31-40

Patients

Observation period : August 2011- July 2012
The prevalence of RLS in our clinic is 5.3% (7cases/131pts)

7 patients with RLS

Age : 56.3±13.5 years old

Males/Females : 4/3

Dialysis vintage : 150.4±84.8 months

Cause of ESRD : CGN 2, DMN 2, PKD 2, FGS 1

Serum level

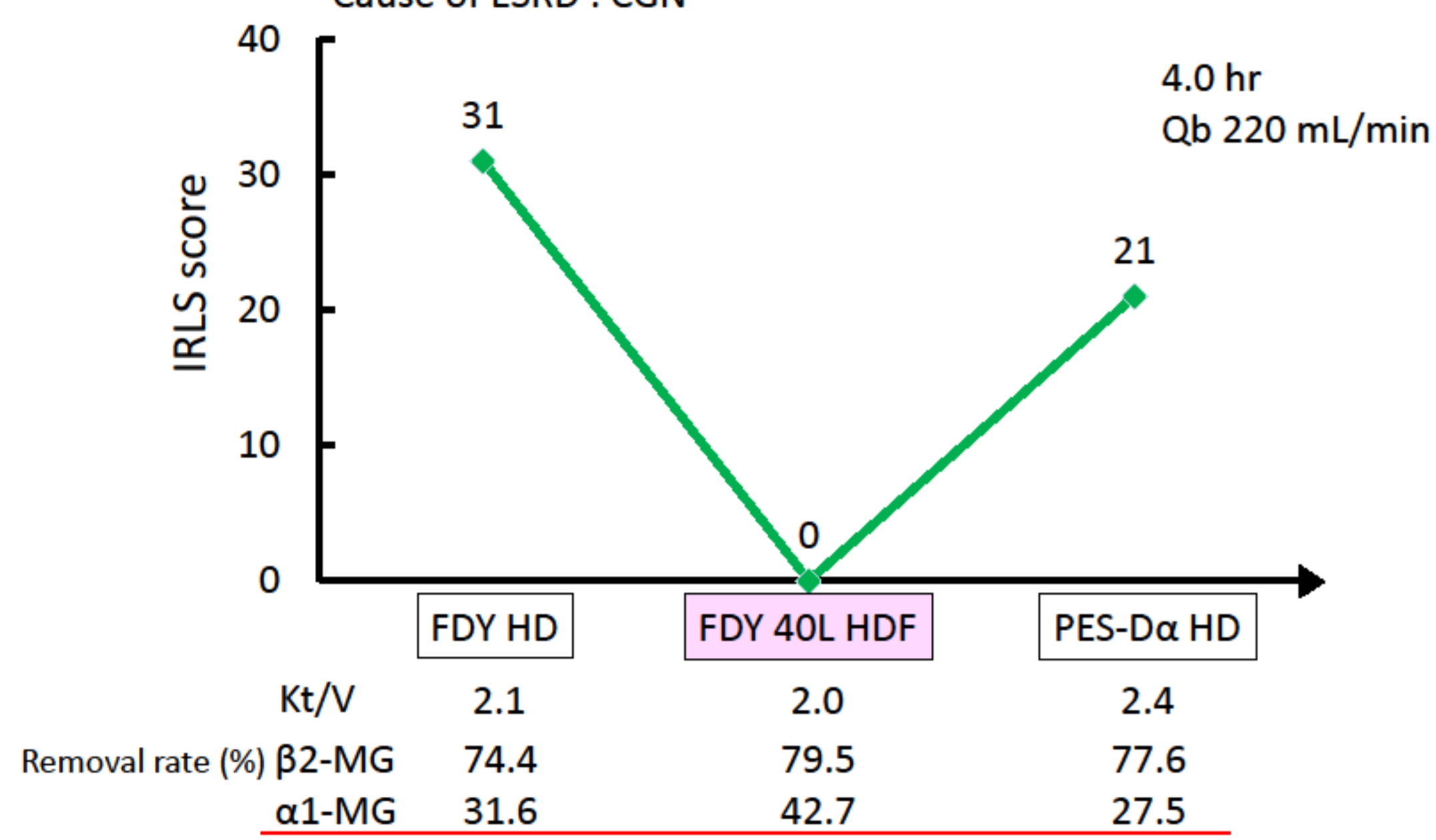
Iron ($\mu\text{g/dL}$): 71.6±25.0

Ferritin (ng/dL): 114.4±203.7

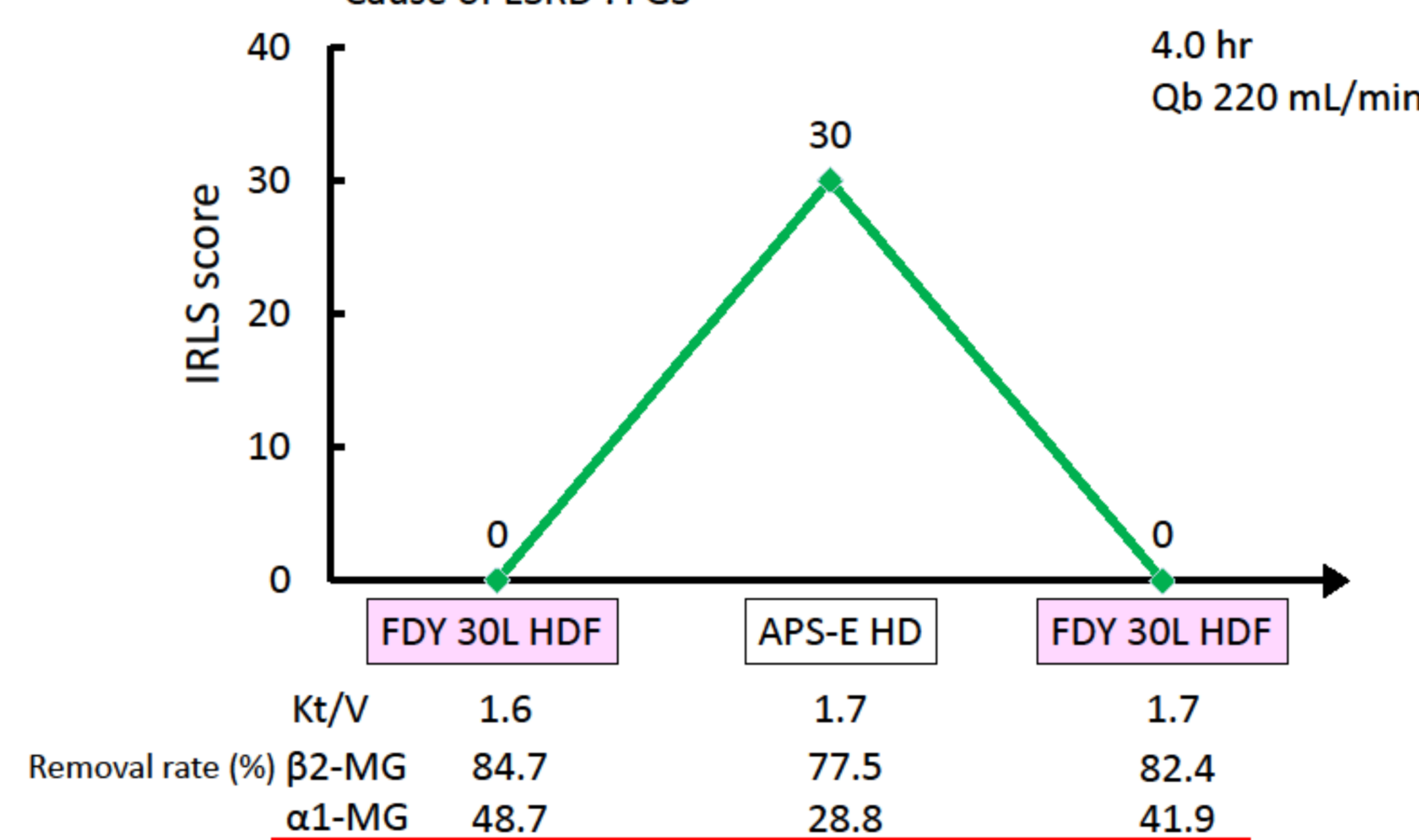
TSAT (%): 26.9±12.2

Results

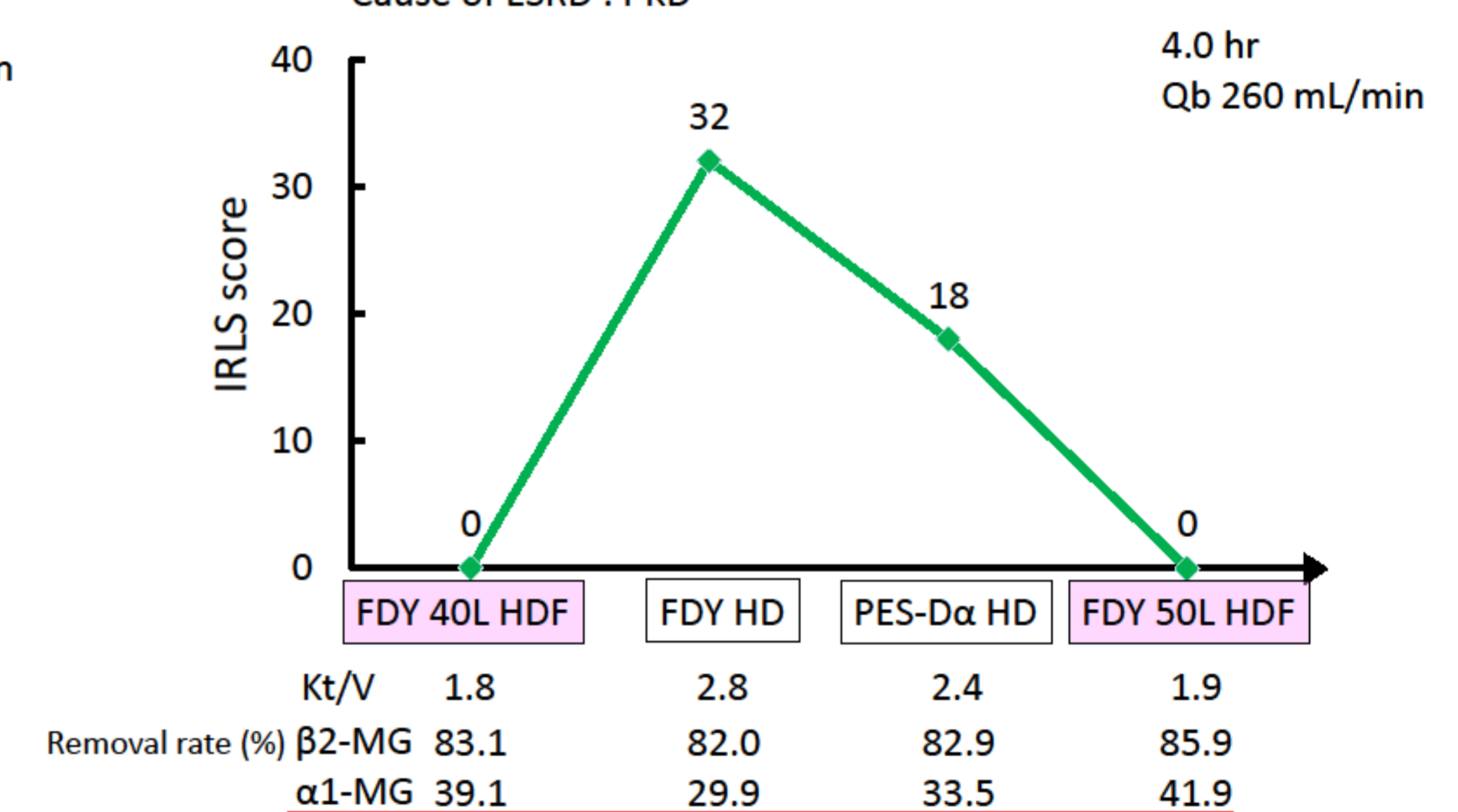
Case 1. Female Age : 73 yrs
Dialysis vintage : 142 months
Cause of ESRD : CGN



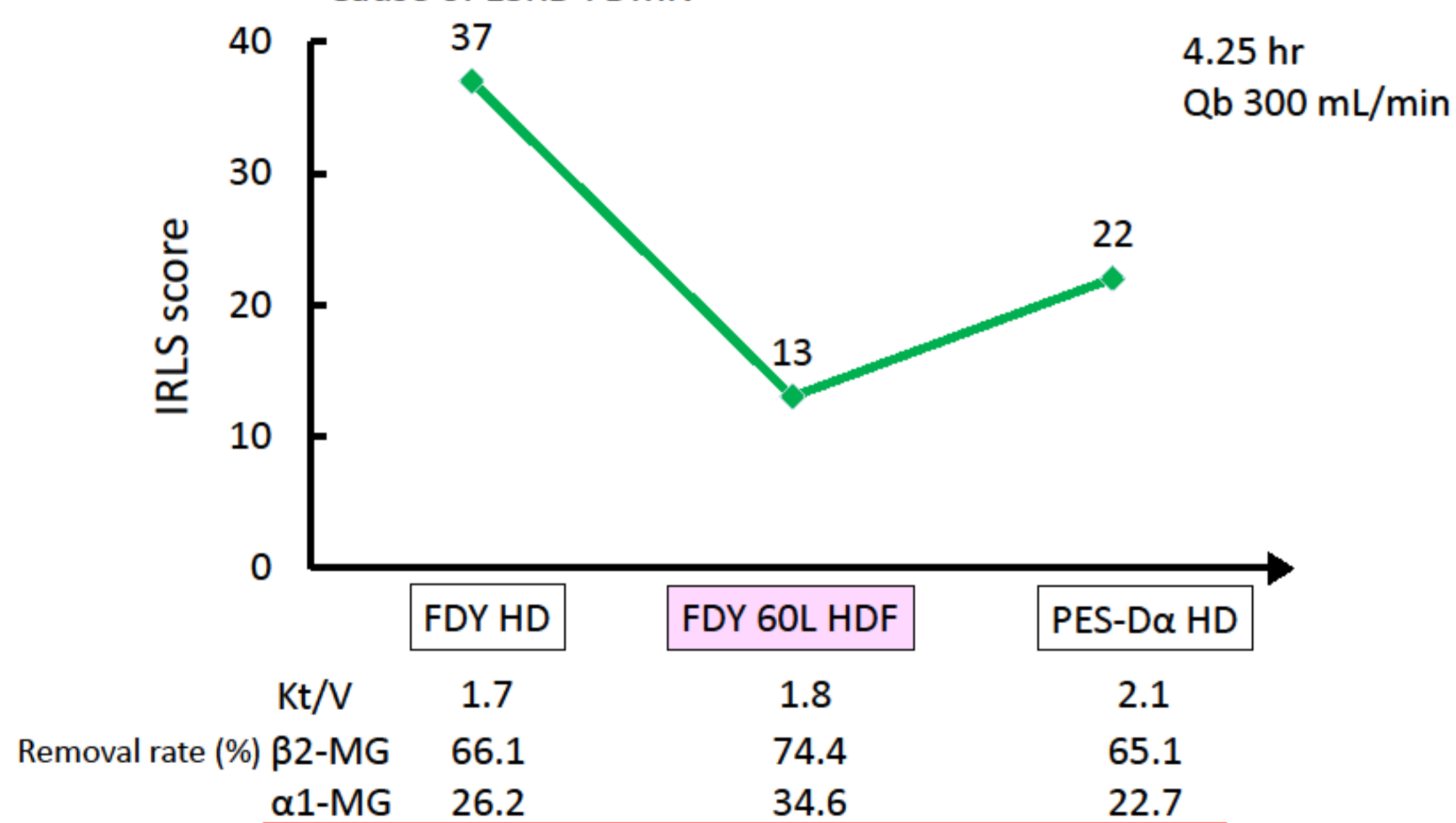
Case 2. Female Age : 29 yrs
Dialysis vintage : 175 months
Cause of ESRD : FGS



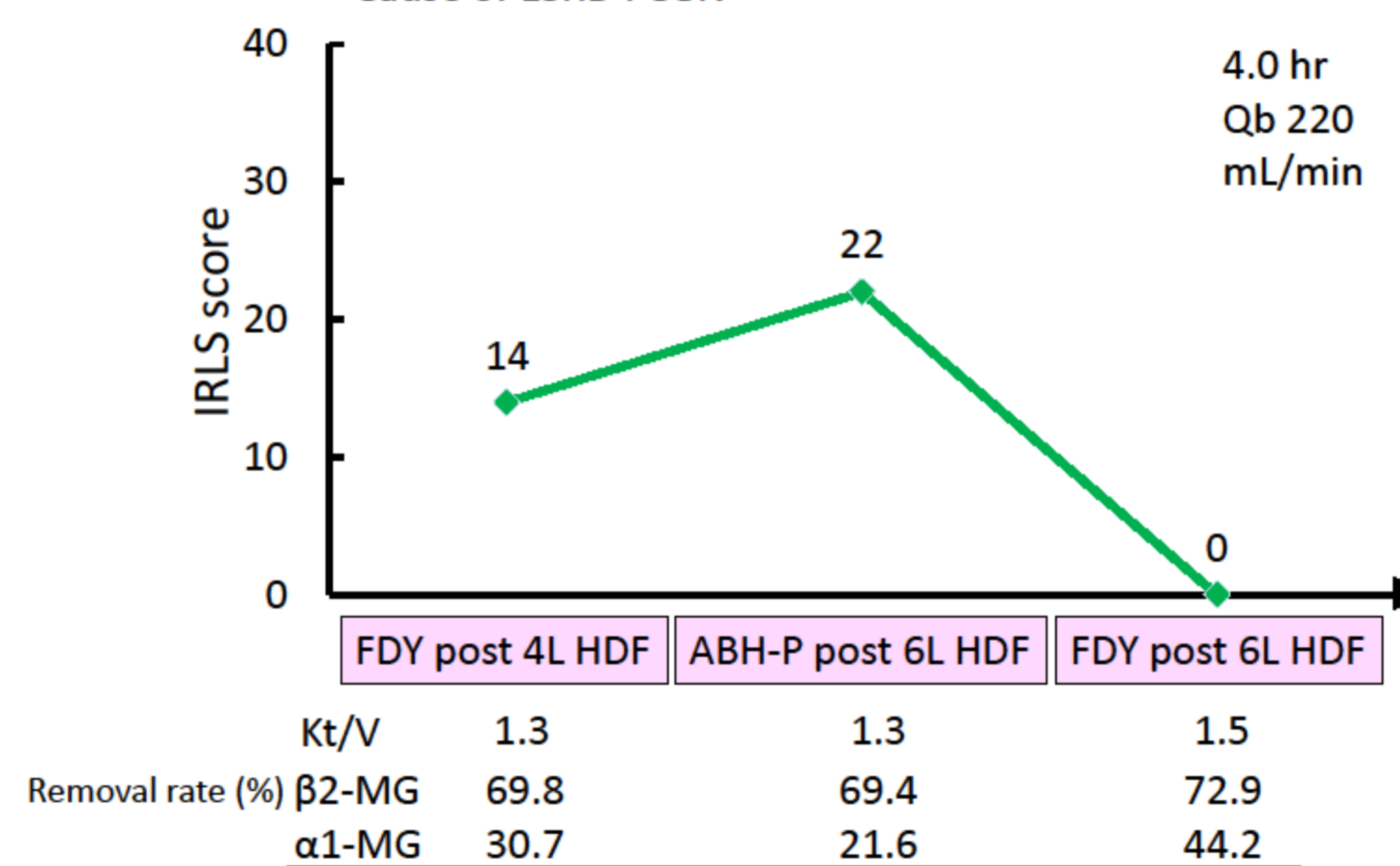
Case 3. Female Age : 58 yrs
Dialysis vintage : 157 months
Cause of ESRD : PKD



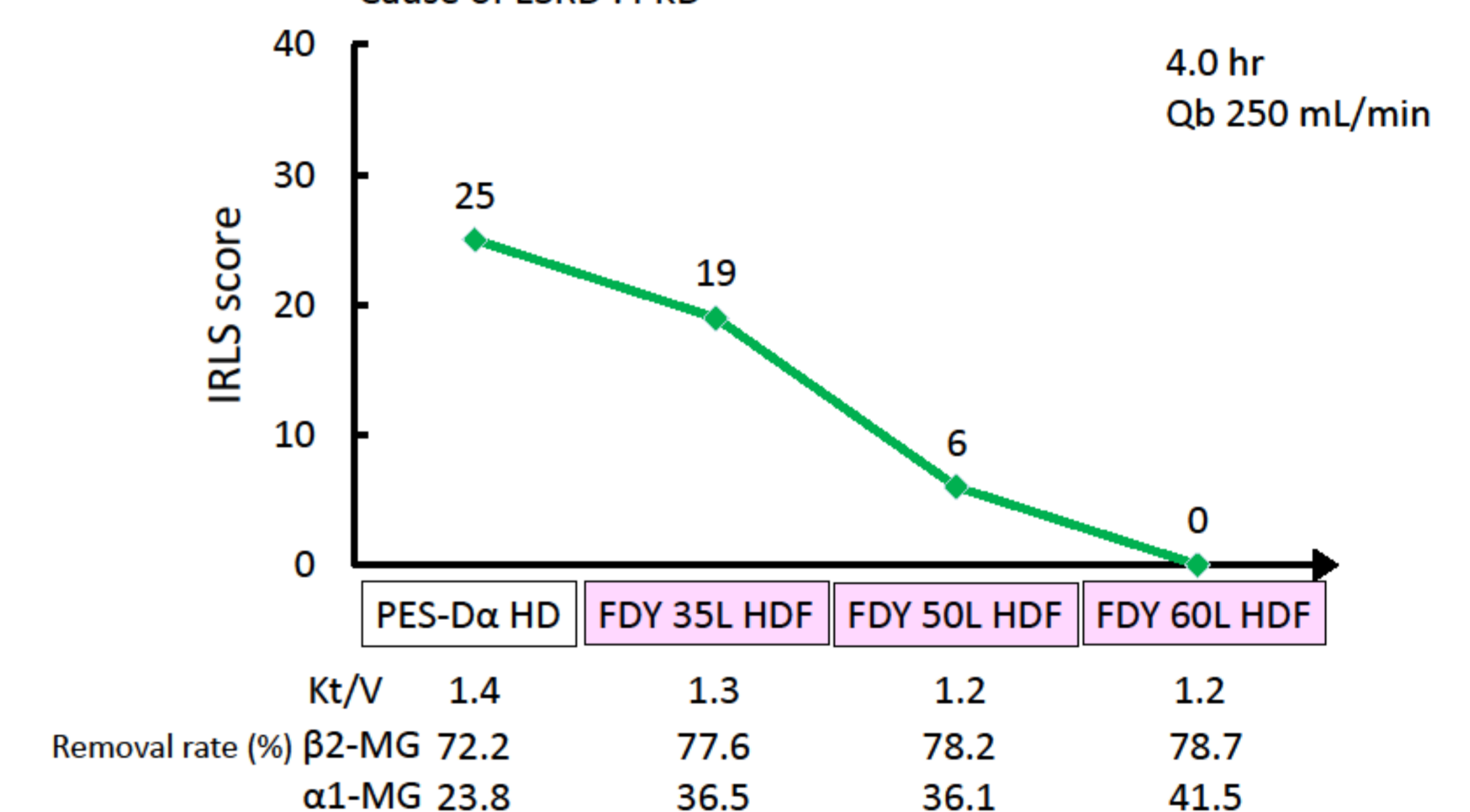
Case 4. Male Age : 61 yrs
Dialysis vintage : 101 months
Cause of ESRD : DMN



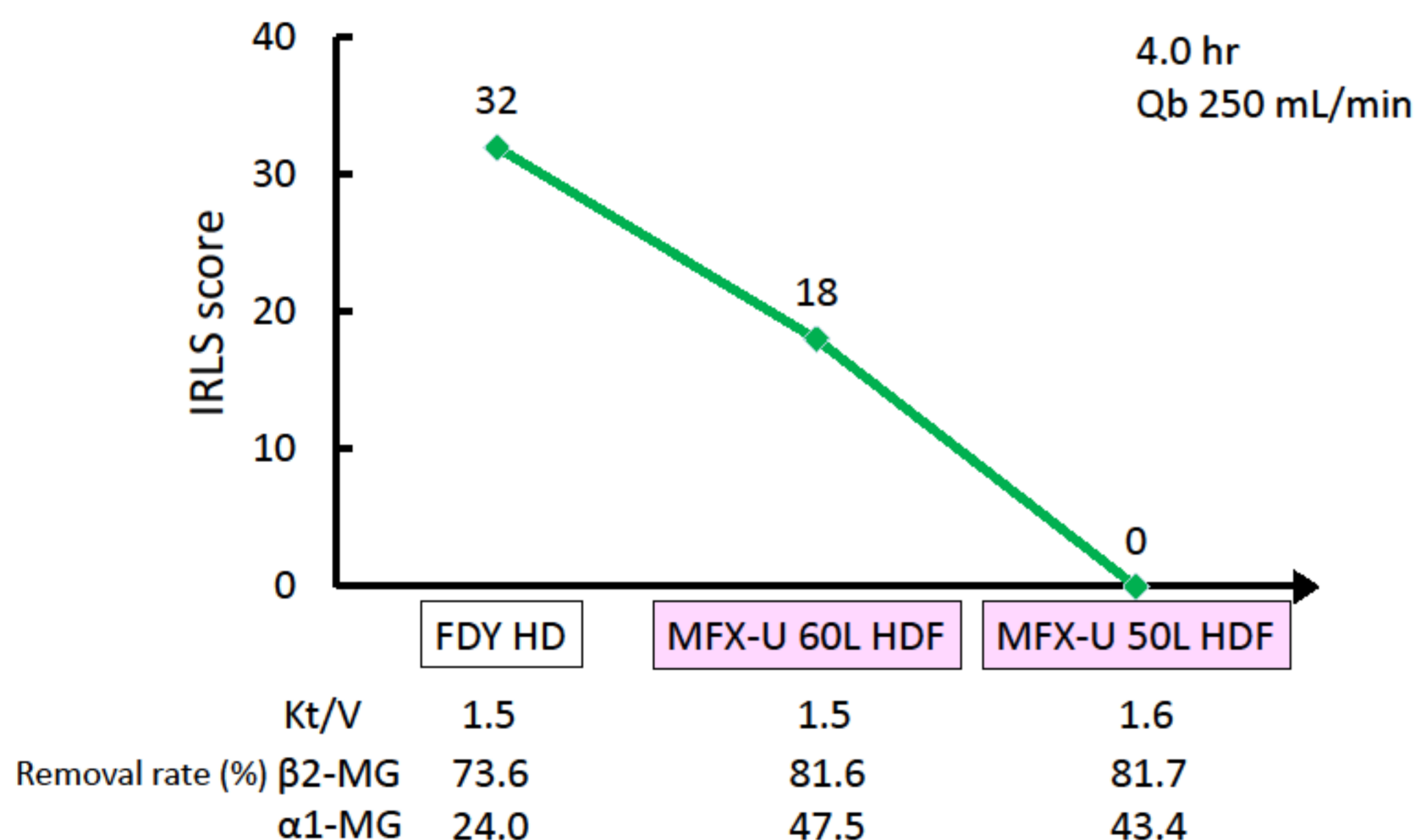
Case 5. Male Age : 61 yrs
Dialysis vintage : 325 months
Cause of ESRD : CGN



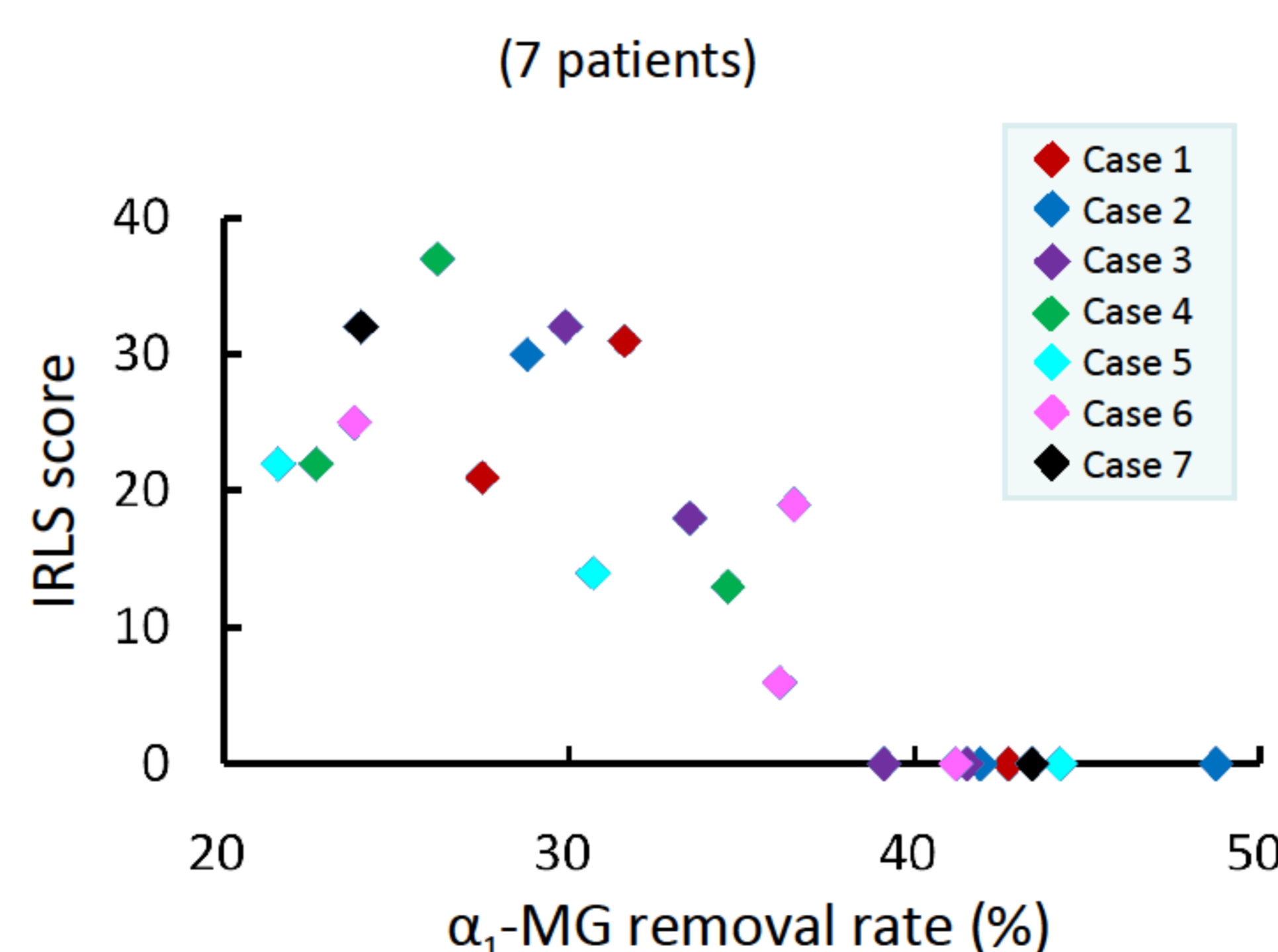
Case 6. Male Age : 46 yrs
Dialysis vintage : 23 months
Cause of ESRD : PKD



Case 7. Male Age : 66 yrs
Dialysis vintage : 130 months
Cause of ESRD : DMN



Relationship between IRLS scores and α_1 -MG RR



The α_1 -MG removal rate and IRLS score during the course of treatment of 7 cases of restless legs syndrome are shown. Although the symptoms were alleviated up to α_1 -MG removal rates of 35%, RLS was not cured, and an α_1 -MG removal rate of 38% or more was needed to cure RLS.

Relationship between solute removal and RLS

- Both the onset and relief of RLS symptoms were strongly correlated with α_1 -MG removal
- RLS may occur at Kt/V of 2.0 or more
- RLS may occur at β_2 -MG removal rate of 80%
- RLS may occur at α_1 -MG removal rate of 30%
- RLS can be cured at 40% or more of α_1 -MG removal rate

Discussion

Prevalence of RLS in dialysis patients of 12% to 62% have been reported, and the prevalence in our clinic is 5.3% (7/131).

The IRLS scores of the 7 patients in our clinic were negatively correlated with the α_1 -MG RRs.

RLS symptoms persisted when the α_1 -MG RR was under 35%, and resolved when the RR was 40% or more.

RLS symptoms can be alleviated by performing high-efficiency HDF, which provides an α_1 -MG RR of 35% more.

Conclusions

Setting dialysis condition removing uremic toxins with molecular weight of 30 kDa or more is important for the treatment of RLS.

Since setting this condition for on-line HDF is easy, it is the optimal strategy for treating RLS.

