

# Conversion from Low to High Magnesium Dialysate: A Single Center Experience

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## Introduction

Intradialytic hypotension (IDH) is a potentially modifiable risk factor that contributes to excessive cardiovascular mortality in hemodialysis (HD) patients.

It has previously been suggested that higher Mg dialysate concentration might help to prevent IDH. In this study we retrospectively analyzed whether the conversion from normal to high dialysate Mg was associated with changes in the frequency of IDH.

## Results

### 1 Patient characteristics

	n = 45
Age (years)	57.9 ± 17.6
Sex (male/female)	31/14
Time on HD (years)	10.5 ± 8.0
Hypertension (%)	17.8
Diabetes mellitus (%)	8.8
CV disease (%)	40.0
HD sessions analyzed in total	13480
HD sessions per patient analyzed	301.8 ± 21.1
HD treatment duration (hrs/week)	4-5
Qb (mL/min)	300
Qd (mL/min)	500
Dialysate HCO <sub>3</sub> (mmol/L)	30-36
Dialysate Ca (mmol/L)	1.25

### 2 Clinical and routine laboratory parameters prior to and after change of dialysate

	low dialysate Mg	high dialysate Mg	p value
HD sessions	150.4 ± 2.09	151.4 ± 1.81	0.6679
Serum Mg (mmol/L)	1.12 ± 0.03	1.35 ± 0.04	< 0.0001
IDH (%)	1.59 ± 0.34	1.08 ± 0.27	0.0395
Leg cramps (%)	9.77 ± 2.50	6.82 ± 2.14	0.0942
HGB (g/L)	116.4 ± 0.97	114.3 ± 0.77	0.0236
MCV (fL)	94.90 ± 0.91	93.64 ± 0.87	0.0039
MCH (pg)	32.02 ± 0.35	31.13 ± 0.35	< 0.0001
MCHC (g/dL)	33.75 ± 0.13	33.24 ± 0.14	< 0.0001
FER (µg/L)	494.8 ± 42.1	451.8 ± 34.8	0.1782
Transferrin (mg/dL)	187.1 ± 5.5	194.3 ± 6.0	0.0354
Tsat (%)	23.74 ± 1.05	21.78 ± 1.00	0.0325
IV iron dose/month (mg)	102.6 ± 13.9	117.6 ± 8.8	0.2907
EPO dose/week (IU)	4262 ± 412	4703 ± 518	0.1303
CRP (mg/L)	4.76 ± 0.73	5.55 ± 0.74	0.0745
Albumin (g/L)	41.97 ± 0.32	42.26 ± 0.32	0.2174
Total cholesterol (mg/dL)	166.67 ± 4.64	179.82 ± 5.03	0.0036
LDL cholesterol (mg/dL)	81.73 ± 3.08	88.92 ± 3.97	0.0577
HDL cholesterol (mg/dL)	47.53 ± 2.67	48.72 ± 3.09	0.4807
triglycerides	2.80 ± 0.25	2.77 ± 0.29	0.9026
Ca (mmol/L)	2.22 ± 0.02	2.18 ± 0.02	0.0638
PO4 (mmol/L)	1.69 ± 0.05	1.67 ± 0.03	0.7399
iPTH (pg/mL)	199.0 ± 23.5	168.6 ± 20.1	0.1183

## Conclusion

Increasing dialysate Mg from 0.5 to 1.0 mmol/L reduced the event rate of IDH.

This was paralleled by potentially adverse effects on hematological and lipid parameters that were not described previously.

While these data are consistent with a therapeutic role for Mg in preventing IDH, they also underline the need for prospective trials to further explore potential benefits and adverse effects of different dialysate Mg concentrations.

## Methods

We changed our center's standard Mg dialysis fluid concentration from 0.5 mmol/L to 1.0 mmol/L.

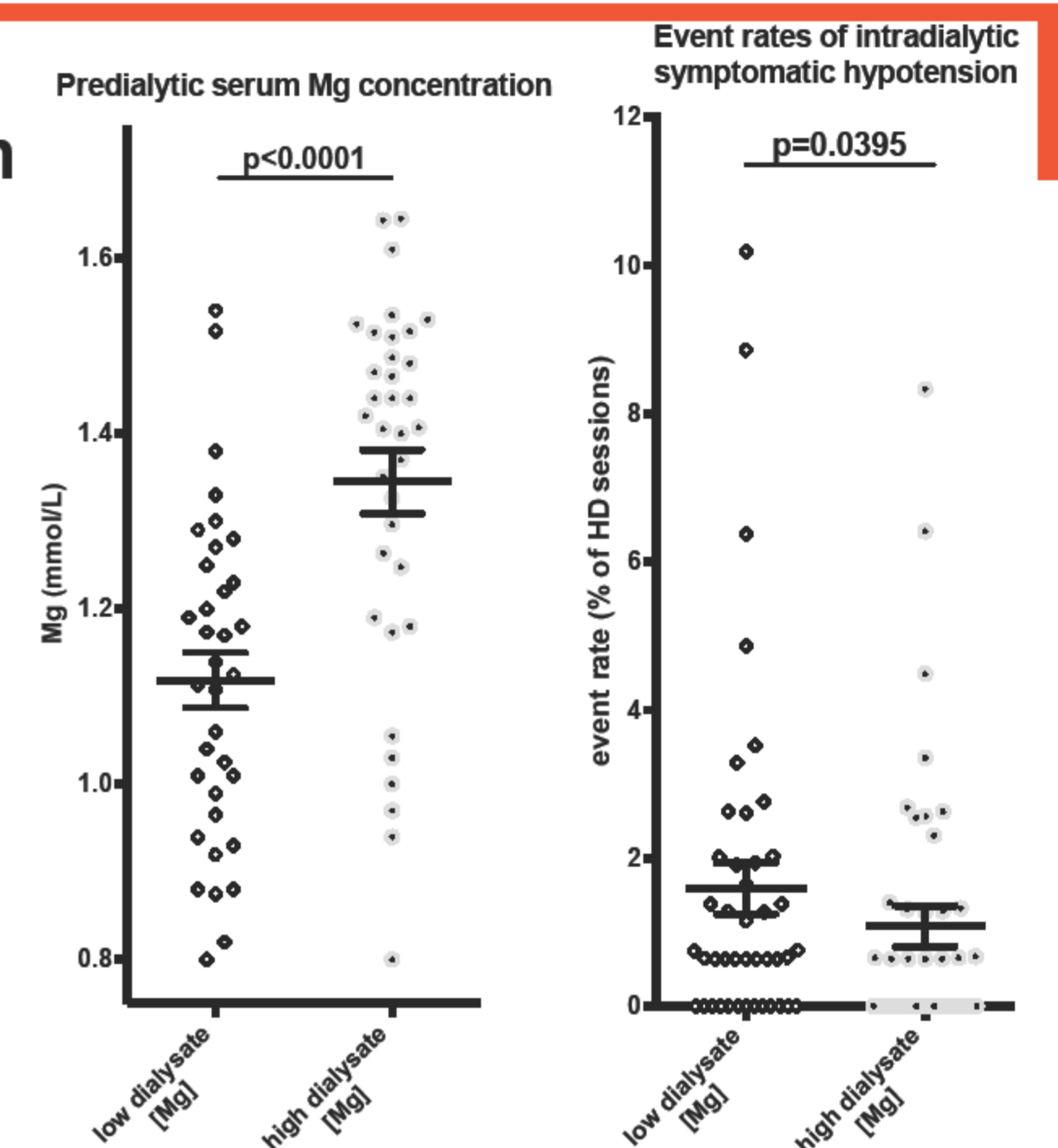
In 45 chronic HD patients, we retrospectively compared event rates of IDH during one year before and after the change in dialysis fluid Mg concentration.

IDH was defined by a drop in systolic blood pressure >20 mmHg and concurrent requirement of volume expansion.

### 3 Effects on serum Mg & intradialytic hypotension

Conversion of dialysate Mg caused a highly significant increase in mean pre-dialysis serum Mg levels.

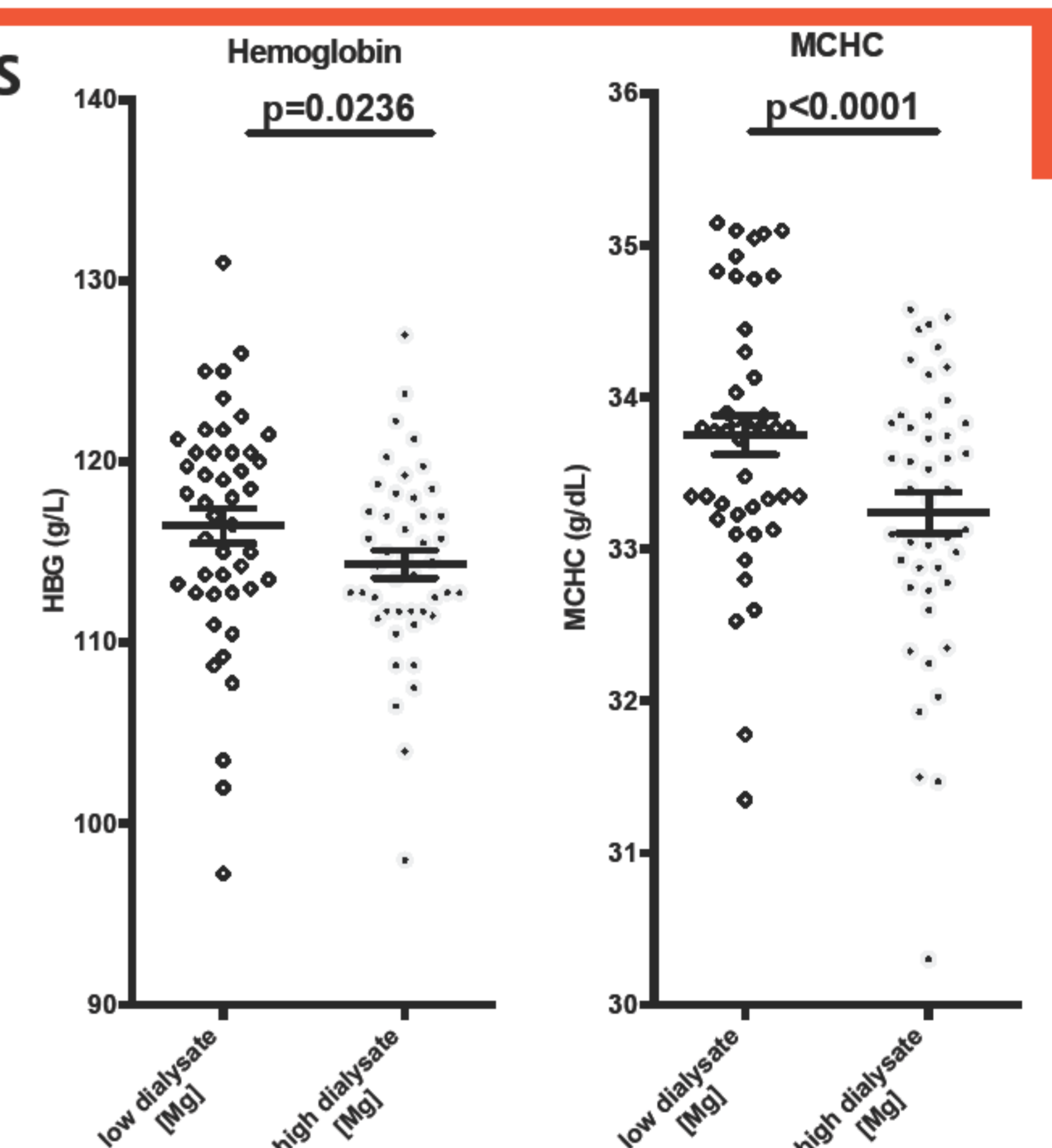
IDH occurred in 75% of patients over the course of the total study period. Frequency of IDH decreased with high dialysate Mg.



### 4 Effects on hematopoiesis

Unexpectedly, we noticed a fall in HGB levels, which was accompanied by highly significant decreases in erythrocyte indices MCV, MCH and MCHC.

Prescription of ESA and IV iron was stable with a trend towards even higher doses after Mg dialysate conversion (data not shown).



### 5 Effects on CKD-MBD & lipid metabolism

Higher Mg was associated with lower serum iPTH, though statistically not significant (data not shown).

We noticed a significant increase in total cholesterol as well as a strong trend towards higher LDL cholesterol, whereas HDL cholesterol and triglycerides were stable.

