

# Frequency and severity of muscle cramps in chronic hemodialysis patients – single center experience

Aleksandra Parmakovska - Domazetovska, Nikolina Smokovska, Marko Ilievski, Katerina Spaseska - Gurovska, Elena Babalj - Banskolieva, Angel Oncevski, Risto Grozdanovski

Special Hospital for Nephrology and Dialysis DIAMED - Skopje, Republic of Macedonia

## OBJECTIVES

Muscle cramps are very often a burden on patients who are on chronic hemodialysis (HD) regimen. The aim of this analysis is to evaluate the frequency and severity of muscle cramps in hemodialysis patients (pts).

## METHODS

Muscle cramps in all of the patients in our center were evaluated from the answers of the specially designed questionnaire for the frequency and severity of cramps during a hemodialysis session. The severity of the cramps was scored from 1 to 10 (10 being the most severe muscle cramp). Biochemical and hematological analysis were performed on a regular basis. Also on a regular basis were monitored blood pressures, ultrafiltration (UF) rate and interdialytic weight gain (IDWG). The concentration of potassium and magnesium in the dialysate fluid were constant, 2 mmol/L and 1mmol/L.

## RESULTS

From a 108 pts, 104 answered the questionnaire, 59 of them were males (56.7%), and mean age was  $61.5 \pm 11.68$  years. The minimum duration of HD was 3 months, high-flux bicarbonate trice weekly regimen from 4 to 5 hours per session. 64 (61.5%) of the patients had experienced muscle cramps at least once weekly, most often in the lower extremities, in the second half of the HD session. They predominated in males (34 or 53%) compared to females (30 or 47%). There was no statistical significance in the mean value of the clinical, dialysis or laboratory variables among patients with or without muscle cramps, with an exception of the value of the predialysis blood potassium (K) level (Table 1). The mean severity score of the muscle cramps was  $5.78 \pm 1.73$ . Patients with hemoglobin (Hb) concentration  $<110\text{g/L}$  versus pts with  $\text{Hb} \geq 110\text{g/L}$  had severity score  $4.25 \pm 2.99$  and  $3.38 \pm 3.16$  respectively,  $p=0.210$ . **Predialysis plasma magnesium (Mg) level  $<1.34$  mmol/L versus  $\text{Mg} \geq 1.34$  mmol/L had severity score  $4.44 \pm 2.94$  and  $2.62 \pm 3.06$ , respectively,  $p=0.003$** , and female vs males  $4.25 \pm 3.13$  and  $3.15 \pm 3.07$  respectively,  $p=0.07$ . Analysis of the severity scores of muscle cramps showed that the most frequent scores were 4 (15.38%), 5 (26.15%), 6 (16.92%), 7 (15.38%) and 8 (12.3%). Some kind of intervention was required in 60 (94%) of the patients (massage of the affected area, infusion of hypertonic glucose or isotonic saline, reduction of the UF rate or early termination of the HD session).

**Binary logistic regression showed that on muscle cramps significant influence had only predialysis plasma potassium level (B -0.694,  $p=0.048$ ).**

Table 1. Different variables that influence the presence of muscle cramps (N =64 pts)

	Mean	t-test for equality of means	p-value	95% CI	
				Lower	Upper
Age (years)	$61.86 \pm 12.07$	-0.391	0.697	-5.534	3.715
Gender	$0.55 \pm 0.5$	0.529	0.598	-0.147	0.253
Urea (mmol/L)	$18.6 \pm 4.04$	0.83	0.409	-0.968	2.353
Hb (g/L)	$116.42 \pm 12.15$	0.648	0.519	-3.427	6.734
Na (mmol/L)	$137.56 \pm 2.78$	-0.956	0.342	-1.656	0.581
K (mmol/L)	$5.48 \pm 0.58$	2.046	0.043	0.008	0.491
iCa (mmol/L)	$1.15 \pm 0.07$	-0.515	0.608	-0.038	0.022
AP (U/L)	$138.05 \pm 92.22$	-2.511	0.014	-59.762	-6.986
Mg (mmol/L)	$1.34 \pm 0.16$	1.514	0.134	-0.015	0.11
IDWG (%)	$2.75 \pm 1.00$	-1.253	0.214	-0.672	0.153
Dialysis vintage (months)	$76.69 \pm 70.86$	-1.803	0.074	-43.081	2.056
spKt/v	$1.52 \pm 0.27$	1.094	0.278	-0.051	0.175
dNa (mmol/L)	$137.42 \pm 1.53$	-0.934	0.353	-0.850	0.307
dCa (mmol/L)	$1.47 \pm 0.13$	-1.169	0.246	-0.078	0.02

## CONCLUSIONS

The frequency of the muscle cramps in the patients who are on chronic hemodialysis in our center showed association with lower levels of predialysis plasma potassium and the severity is associated with lower magnesium concentrations. The results point out the need for further studies who will evaluate the efficiency and safety of individualized concentrations of potassium and magnesium in the dialysis fluid in patients with painful muscle cramps during hemodialysis.

## REFERENCES

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