

THE ASSOCIATION OF KDIGO SUGGESTIONS FOR CHRONIC KIDNEY DISEASE - MINERAL AND BONE DISORDER MARKERS ACHIEVEMENT AND DIFFERENT ANKLE BRACHIAL SYSTOLIC PRESSURE INDEXES IN OUR HEMODIALYSIS PATIENTS

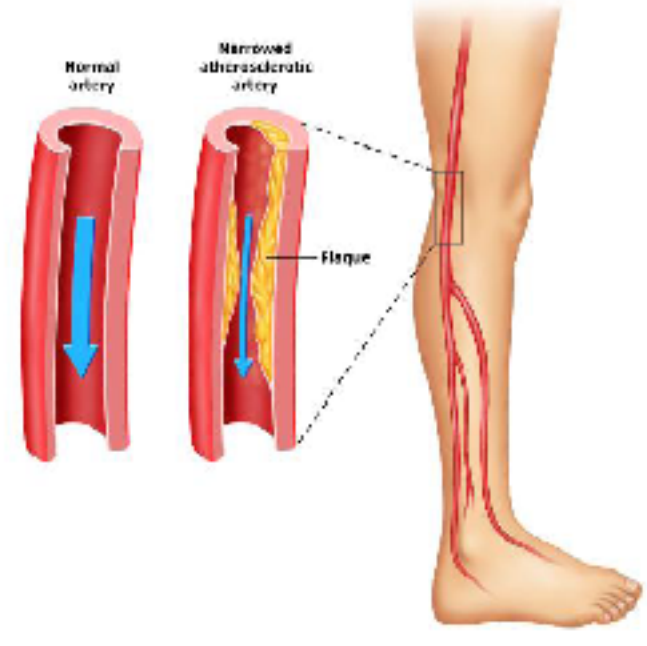


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INTRODUCTION

Hemodialysis (HD) pts are particularly prone to the development of atherosclerosis of lower limbs (1).



Peripheral arterial disease (PAD) is observed in a considerable percentage of HD pts (2). Arterial intima calcification is associated with development of occlusive lesions and PAD (3).

It was suggested that a resting ankle brachial systolic pressure index (ABI) level of ≤ 0.90 is 95% sensitive in detecting an angiogram-positive PAD (4).

It is also known that falsely elevated pressures or incompressible arteries at the ankle level and $ABI \geq 1.30$ might be caused by mediosclerosis (arterial media calcification) (4).

Numerous epidemiologic studies have demonstrated that an increases in serum phosphorus (P) and the calcium (Ca), as well as abnormalities in serum parathyroid hormone (PTH) levels are associated with significant increased arterial calcification in HD patients (5).



The KDIGO (Kidney Disease: Improving Global Outcomes) clinical practice guidelines for the Diagnosis, Evaluation, Prevention, and Treatment of Chronic Kidney Disease – Mineral and Bone Disorder (CKD-MBD) provided recommended target ranges for serum CKD-MBD markers (6).

It is necessary to know the percentages of HD pts out of KDIGO suggested range for CKD-MBD markers in order to prevent the development of arterial calcification and to reduce PAD and mediosclerosis.

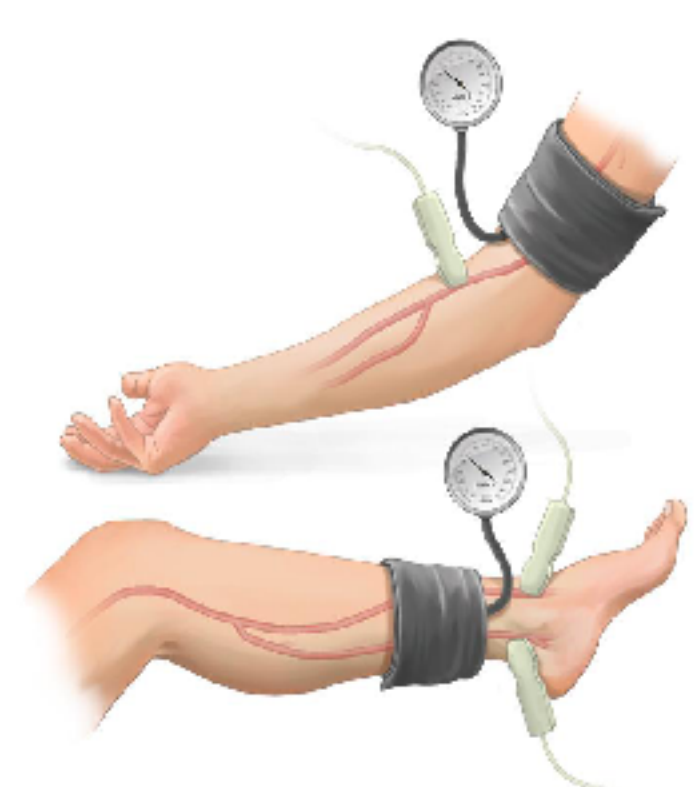
AIM

The aim of this study was to evaluate the association between the attainment of KDIGO suggestions for CKD-MBD markers and the presence of various ABI levels in our HD pts.

MATERIALS & METHODS

Cross-sectional study.

We examined 137 prevalent HD pts: (85 men; mean age 55.8 14.2 years; HD duration 91.3 54.7 months)



We evaluated:

- the presence of PAD ($ABI \leq 0.9$) and mediosclerosis ($ABI \geq 1.3$) using ABI measurements (4).
- serum levels of the CKD-MBD markers (Ca, P and PTH) of the last 12 months records.

We compared: among the groups of pts with various (normal 0.9-1.3, high ≥ 1.3 and low ≤ 0.9) ABI levels:

- serum levels and
- the proportion of the KDIGO guideline achieved ranges for CKD-MBD markers.

RESULTS

The groups did not differ significantly in variables that may influence PAD and mediosclerosis (table 1).

	normal ABI (n=59) 43.1%	high ABI (n=45) 32.8%	low ABI (n=33) 24.1%	p value
age (years)	54.5±16.3	55.3±17.6	56.8±14.7	ns
gender (male / female)	37 / 22	28 / 17	20 / 13	ns
arterial hypertension (yes / no)	15 / 44	10 / 35	9 / 24	ns
diabetic patients (yes / no)	6 / 53	5 / 40	4 / 29	ns
dyslipidemia (yes / no)	10 / 49	8 / 37	7 / 26	ns
smoking (yes / no)	8 / 51	6 / 39	5 / 28	ns
BMI (kg/m ²)	22.7 ± 3.5	22.1 ± 3.3	21.8 ± 4.2	ns
serum CRP (mg/L)	5.8 ± 6.2	6.5±5.6	7.1±6.6	ns
coronary artery disease (yes / no)	3 / 56	3 / 42	2 / 31	ns

In total, 1294 data for serum Ca, 1266 data for serum P and 224 data for serum PTH were analyzed.

There was no significant difference in the serum CKD-MBD marker levels between the groups (table 2).

In contrast, patients with normal range ABI had significantly higher % of attained KDIGO recommended levels for serum Ca, serum P and serum PTH in comparison with the other two groups of patients (table 2). High ABI patients had significantly higher % of data attainment for serum PTH in comparison with low ABI group of patients (table 2). There were no difference in the attainment of the recommended levels for serum Ca and P between the low ABI and high ABI groups of patients (table 2).

Table 2: data for serum CKD-MBD markers analyzed as a function of ABI status:

	normal ABI (n=59) 43.1%	high ABI (n=45) 32.8%	low ABI (n=33) 24.1%	p value
serum Ca (mmol/L)	2.28±0.11	2.34±0.19	2.38±0.26	NS
serum P (mmol/L)	1.38±0.37	1.48±0.52	1.59±0.47	NS
serum PTH (pg/ml)	146.1±121.6	138.8±241.3	188.4±172.3	NS
serum Ca in KDIGO proposed ranges (%)	389 / 557 69.8 ^{a c}	107 / 426 25.1	108 / 311 34.7 ^d	<0.001
serum P in KDIGO proposed ranges (%)	328 / 545 60.2 ^{b a}	148 / 417 35.5	97 / 304 31.9	<0.01
serum PTH in KDIGO proposed ranges (%)	62 / 96 64.6 ^{c b}	30 / 74 40.5 ^e	11 / 54 20.4	<0.01

Ca (calcium), phosphate (P), parathyroid hormone (PTH), ABI (ankle brachial systolic pressure index)
Normal ABI (patients with ABI between 0.91-1.29)
High ABI (patients with $ABI \geq 1.30$)
Low ABI (patients with $ABI \leq 0.90$)
Normal ABI vs High ABI or Low ABI : a (p<0.05), b (p<0.01), c (p<0.001);
High ABI vs Low ABI : d (p<0.05); e (p<0.01); f (p<0.001)

CONCLUSIONS

- The proportions of CKD-MBD markers achievement within the KDIGO guidelines might be a superior indicator than their serum levels in the evaluation of PAD and mediosclerosis pathogenesis in HD patients.
- In HD population, a greater prevention of PAD and mediosclerosis development could be managed if a higher proportion of the KDIGO suggested levels for the serum CKD-MBD markers are achieved.

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