THE RELATIONSHIP BETWEEN KDIGO SUGGESTIONS FOR CKD-MBD MARKERS ATTAINMENT AND QT INTERVAL (ECG) DURATION IN OUR HEMODIALYSIS PATIENTS

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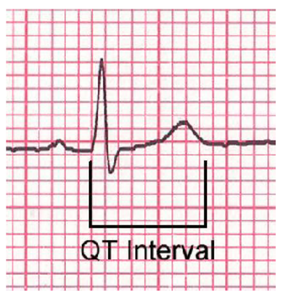
INTRODUCTION



Hemodialysis (HD) pts may be at greater risk of cardiac arrhythmias and sudden death in post-dialysis period due to the prolongation of the QT interval on electrocardiograms (ECG) (1-3).

Numerous epidemiologic studies on HD pts have demonstrated that disturbances of mineral metabolism such as elevated serum phosphate (P) and calcium (Ca) levels appear to contribute to high mortality risk (4). Serum parathyroid hormone (PTH) levels out of recommended targets are associated with a high incidence of death (4).

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 (5).

It is necessary to known the percentages of HD pts out of KDIGO suggested range for CKD-MBD markers in order to reduce cardiovascular disease and mortality.

AIM

The aim of this study was to compare the percentages of the attained KDIGO suggested levels for CKD-MBD markers in our HD patients with different values of the post-HD recorded QT interval duration. .

MATERIALS & METHODS

Cross-sectional study.
We examined 132 prevalent HD pts (78 men; mean age 55.8 24.1 years; HD duration 90.6 61.4 months)

Twelve-lead ECG were performed in all patients immediately after a single HD session to analyzed for QT and QTc (corrected QT for hart frequency) intervals.

We evaluated:
- the duration of QT and QTc intervals calculated from the post-HD recorded 12-lead ECG.
- 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 QT and QTc intervals duration):
- serum levels
- the proportion of the KDIGO guideline achieved ranges for CKD-MBD markers.

RESULTS

The groups did not differ significantly in variables that may influence QT interval prolongation (table 1).

	QT < 370 ms (353.7±19.6) (n=59) 44.7%	QT > 370 ms (388.1±28.3) (n=73) 55.3%	p value	QTc < 430 ms (414.5±25.5) (n=62) 46.9%	QTc>430 ms (450.8±32.3) (n=70) 53.1%	p value
age (years)	56.2±23.8	55.1±24.3	ns	56.3±22.9	55.2±23.4	ns
congestive hart failure (yes / no)	6 / 53	6 / 66	ns	6 / 56	6 / 64	ns
left ventricular hypertrophy (yes / no)	15 / 44	18 / 55	ns	15 / 47	18 / 52	ns
coronary artery disease (yes / no)	4 / 56	4 / 69	ns	4 / 58	4 / 66	ns
arterial hypertension (yes / no)	16 / 43	19 / 54	ns	16 / 46	19 / 51	ns
gender (male / female)	34 / 25	44 / 29	ns	36 / 26	43 / 27	ns
diabetic patients (yes / no)	7 / 52	8 / 65	ns	7 / 55	8 / 62	ns
antiarrhythmic drugs use (yes / no)	3 / 56	3 / 70	ns	3 / 59	3 / 67	ns

The patients with QT interval < 370 ms in comparison with other patients had significantly higher % of attained KDIGO recommended levels for serum Ca and serum P (table 2). Similarly, the patients with QTc interval < 430 ms in comparison with patients with QTc interval > 430 ms had higher % of attained KDIGO recommended levels for serum Ca and serum P (table 3).

There was no difference in % of the attained KDIGO recommended levels for serum PTH between the groups of patients with various QT and QTc interval duration (table 2, table 3).

Table 2: data for serum Ca, P and PTH analyzed as a function of QT status:

	QT < 370 ms (353.7±19.6) (n=59) 44.7%	QT > 370 ms (388.1±28.3) (n=73) 55.3%	p value
total serum Ca in KDIGO proposed ranges (%)	390 / 574 67.9	312 / 727 42.9	<0.05
serum P in KDIGO proposed ranges (%)	355 / 583 60.9	232 / 727 31.9	<0.01
serum PTH in KDIGO proposed ranges (%)	72 / 112 64.3	79 / 142 55.6	NS

Table 3: data for serum Ca, P and PTH analyzed as a function of QTc status:

	QTc < 430 ms (414.5±25.5) (n=62) 46.9%	QTc > 430 ms (450.8±32.3) (n=70) 53.1%	p value
total serum Ca in KDIGO proposed ranges (%)	442 / 641 68.9	309 / 689 44.8	<0.05
serum P in KDIGO proposed ranges (%)	383 / 617 62.1	235 / 693 33.9	<0.01
serum PTH in KDIGO proposed ranges (%)	76 / 118 64.4	75 / 136 55.1	NS

CONCLUSIONS

HD patients with a higher percentages of achieved serum Ca and P within the KDIGO suggested levels have shorter post HD QT interval.
The greater prevention of cardiac arrhythmias and sudden death in HD patients probably could be managed if a higher proportion of the recommended levels for serum Ca and P are achieved.

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