Simple vascular calcification score: is it usefull in assessment of prognosis of hemodialysis patients

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INTRODUCTION

Vascular calcification (VC) is one of the major factors contributing the outcomes of hemodialysis patients. The early diagnosis of VC is important for possible direct therapeutic interventions.
The gold standarts for evaluating VC are electron beam computed tomography and multislice computed tomography.

Both methods allow accurate quantitative measurements but are expensive and not easily accessible in everydays practice. The utilisation of plain X ray for screening VC has been suggested by KDOQI and KDIGO. We introduced it to practice in our hemodialysis unit and tried to evaluate it‘s usefulness in assessment of prognosis for survival hemodialysis patients.

AIM AND OBJECTIVES

To evaluate relation between VC assessed by simple vascular calcification score (SVCS) and outcomes in chronic hemodialysis patients.

1. To evaluate prevalence of VC in chronic hemodialysis patients using SVCS based on plain radiography;
2. To analyse possible relationship among calcium-phosphate metabolism disorders, VC and risk of death in hemodialysis patients;
3. To assess VC impact on survival of chronic hemodialysis patients.

METHODS

The SVCS was evaluated in all prevalent chronic hemodialysis patients (n=95) in Hospital of University of Lithuania Health Sciences from February 2013. The analysis of plain radiographic films of pelvis and hands was performed by single radiologist blinded to clinical data. SVCS ≥ 3 considered as cut off value. For the analysis patients were divided into two groups: 1st group SVCS < 3, 2nd group SVCS ≥ 3. Clinical data and laboratory test information was collected from medical records of each patient. Age, HD vintage and other clinical and demographical data were collected on the day of VC assesment. Biochemical parameters (Ca, ionized Ca, P, PTH, AP, total cholesterol, albumin, hemoglobin) were evaluated at the moment of VC assesment as well as at the start of hemodialysis treatment for each patient.
Variables were expressed as frequencies for discrete factors and mean values for continues factors. Comparison was performed using two tailed chi-square test for categorical variables and Students t- test for continuous variables, with p value <0,05 considered as statistical significant. The independent variables associated with death were tested with Cox regression models, using age, sex, hemodialysis vintage, diabetes, Ca, P, PTH, Ca-P product, cholesterol and vascular scores as covariates. Kaplan –Meier survival curves of patients with SVCS ≥3 and <3 were compared by long-rank test.

RESULTS

No statistical significant differences were observed in sex distribution, cardiovascular diseases and hypertension frequency comparing patients between the groups. Biochemical parameters didn‘t differ significantly between the groups neither at the moment of SVCS evaluation nor at the start of the dialysis treatment. Cox regresion analysis revealed no statistical significant difference of relative risk of death with regards to HD vintage, age, sex, diabetes mellitus, Ca, P, PTH, Ca-P product, cholesterol. Only higher SVCS was associated with 1,3 times higher relative risk of death (95% CI 1,032-1,681, p=0,027). Kaplan-Meier analysis revealed that the cumulative hazard of death at 23 months was higher in patients of 2 group (2,7% vs 17,5%, long-rank 4,6, p=0,032).

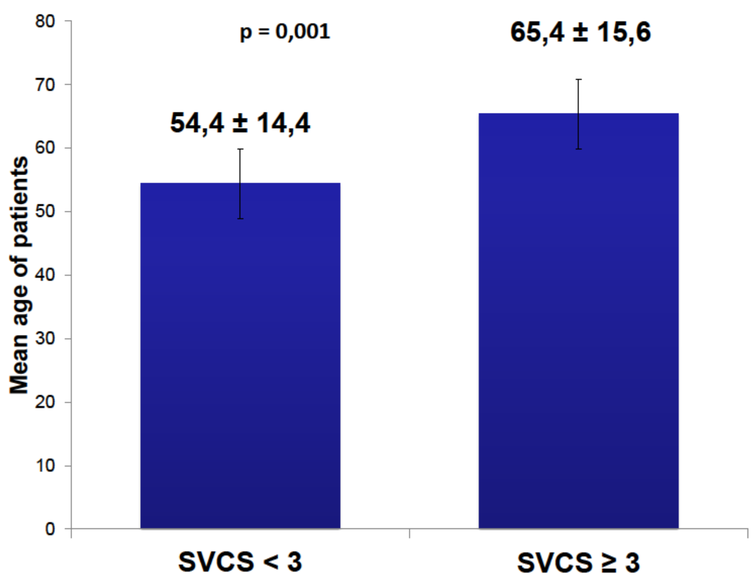

Chart 1. Comparison of SVCS according to age

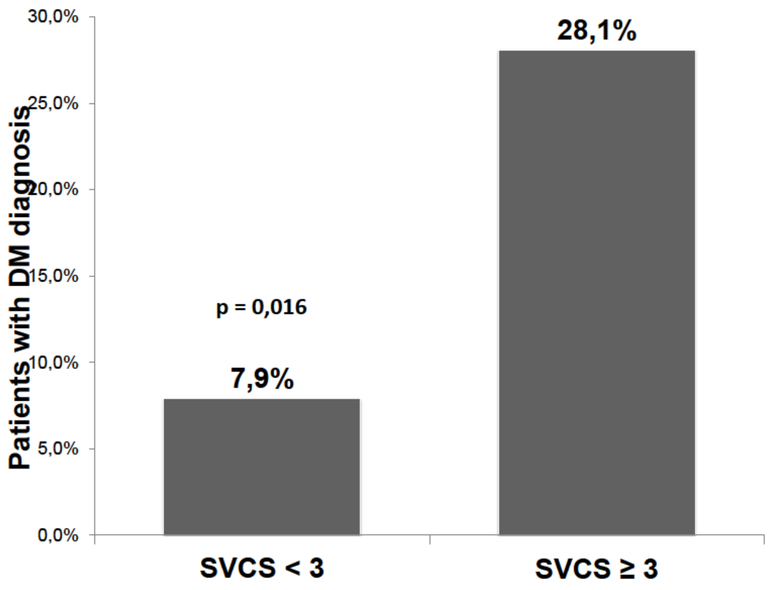

Chart 2. SVCS score's distribution according to diabetes mellitus diagnosis

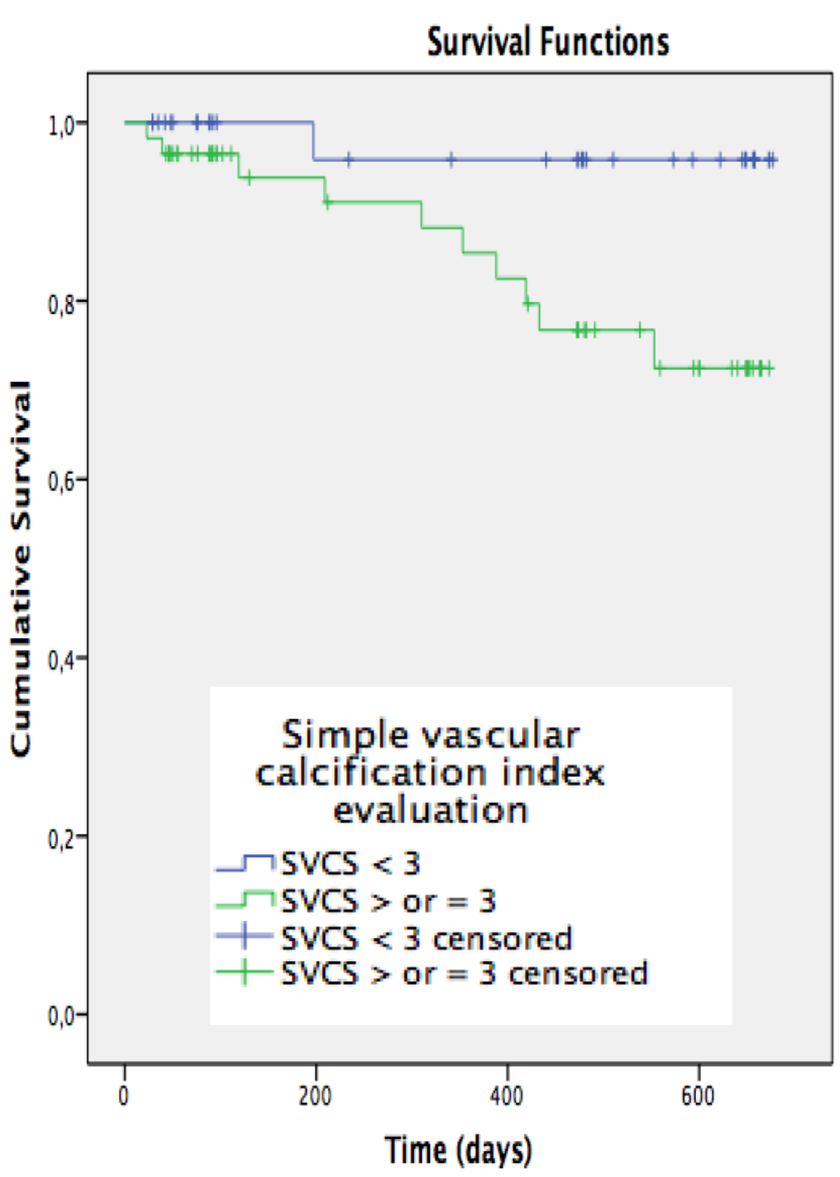

Chart 3. Higher relative risk of death associated with SVCS ≥ 3, long-rank 4,6, p=0,032

Sex distribution	
Male	54 (56,8%)
Female	41 (43,2%)
Mean age (years ± SD)	61,0 ± 15,7
Haemodialysis vintage (years ± SD)	39,7 ± 46,2
Simple vascular calcification score	
< 3	38 (40%)
≥ 3	57 (60%)

Table 1. Demographic data of the patients

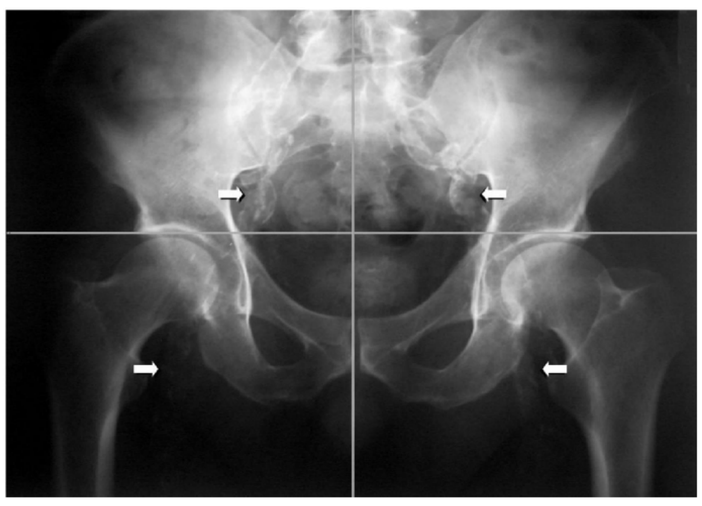

Fig. 1. Calcification score is the sum of the presence (1) or absence (0) of parallel linear calcifications in each section. In the example, pelvis score = 1 + 1 + 1 + 1 = 4.

CONCLUSIONS

1. More than half of prevalent hemodialysis patients had significant vascular calcification detected by plain radiography.
2. Patients with simple vascular calcification score ≥3 were significantly older and had diabetes more often but no statistical significant differences between groups were observed evaluating biochemical markers reflecting calcium-phosphate metabolism.
3. Higher risk of death in studied hemodialysis patients population was associated only with prevalent vascular calcification.

REFERENCES:

Adragao et al. (Nephrology Dialysis Transplantation (2004) 19;1480-88)

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