

Calcification of cardiac valves and arterio venous fistula thrombosis, what stands behind?

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ESRD and then hemodialysis bring themselves a wide variety of difficult to manage and to solve problems with calcium and phosphorus metabolism and cardiac valve calcifications. It is always thought to exist a strong connection between them. The mineral bone disease in maintenance hemodialysis patients is very difficult to control and sometimes hopeless. It is maybe labyrinthic to think about a link between cardiac valve calcifications, dysregulation of calcium-phosphorus metabolism and AVF thrombosis. We decided to solve this labyrinth ongoing this study.

The objective of this study was to evaluate the impact of calcium phosphorus abnormalities and cardiac valve calcification presence on arterio venous fistula (AVF) thrombosis in patients on regular hemodialysis (HD).

Methods: There were 103 patients enrolled in the study (62=60.2% males, 41=39.8% females, mean age 50.27 ± 12.18 years) on chronic hemodialytic treatment, HD (mean duration of HD $54,64 \pm 43,27$ months) that were screened for calcification of the cardiac valves. Primary renal disease were as follows: chronic glomerulonephritis 29.5%, chronic pyelonephritis 29%, nephroangiosclerosis 14,6%, ADPKD 14%, Diabetic nephropathy 9,7% and the rest ESRD of unknown origin. Baseline echocardiography was performed to screen for calcification of the cardiac valves. Echocardiograms were graded as 0-1 for absence or presence of calcification of the mitral and aortic valve. The patients were stratified according to the presence of calcifications or not in two groups: group I, without valvular calcification; group II with calcified valve (either mitral or aortic or both valves). Prior history of AVF thrombosis was obtained through a questionnaire.

Results: 44 patients (42.7%) had previous episodes of AVF thrombosis. Significantly higher percentages of previous history of AVF thrombosis were observed in the group with calcified valves in comparison with group without cardiac valve calcification. Binary logistic regression analyses that the identified cardiac valve calcification presence (one, both valves), serum calcium and serum phosphorus are factors significantly associated with the arterio venous fistula thrombosis.

Patients with cardiac valves calcifications has a 28% higher risk to have AVF thrombosis compared to those without cardiac valves calcifications

OD:1.28, CI95%: 1.17-3.38]

For every 1mg/dl increase in phosphorus levels in blood the risk to have AVF thrombosis increases with 1% [OD:1.01, CI95%: 1.003-1.33];

For every 1 mg/ dl fall in calcium levels in blood the risk to have AVF thrombosis increases with 5.5% [OD:1.06, CI95%: 1.014-1.62]

Conclusions: The episodes of AVF thrombosis in HD patients are more frequent in patients with detected cardiac valve calcification. The presence on echocardiography of cardiac valve calcification and mineral bone disease with calcium and phosphorus dysregulations is associated with higher occurrence of AVF thrombosis in these patients.

