Severe peripheral arterial disease in haemodialysis patients – a five centre study

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Introduction

Peripheral arterial disease (PAD) is an important cause of morbidity and mortality in haemodialysis (HD) patients. Traditional risk factors play a main role, as shown by the HEMO, DOPPS, CHOICE and USRDS Dialysis Morbidity and Mortality Studies. Diabetes mellitus is a major risk factor in all studies, although for other risk factors such as smoking, heart failure, pulse pressure and comorbidity index, statistical importance varies between studies. In the first semester of 2016, PAD represented almost one third (32%) of our patients' in-hospital days. The aim of our study was to evaluate which patients are at higher risk for PAD in our centres.

Methods

From January 1, 2014 to December 31, 2016, 1145 patients were on HD in our centres: 52 with severe PAD with in-hospital admission (group 1) and 1093 patients with no admissions for PAD (group 2). We analysed both groups regarding traditional and non-traditional risk factors.

Results

Variables statistically different between the 2 groups:

	Severe PAD	Non-severe PAD	p-value
Diabetes mellitus	73%	41%	p<0.001
Heart failure	56%	36%	p=0.005
Charlson comorbidity index (CCI)	6	4	p<0.001
Age-adjusted CCI	9	7	p<0.001
Cerebrovascular disease	56%	28%	p<0.001
Vitamin-K antagonists	21%	8%	p=0.001
Pulse pressure pre-HD	85	73	p<0.001
Pulse pressure post-HD	77	68	p=0.002
iPTH (pg/ml)	370	468	p=0.022

Were NOT statistically different between the two groups:

- X age (p=0.145);
- X dialysis vintage (p=0.199);
- X smoking (p=0.273);
- X body mass index (p=0.977);
- X coronary heart disease (p=0.748);
- X serum haemoglobin (p=0.274);
- X albumin (p=0.152);
- X erythropoiesis-stimulating agents dose (p=0.405);
- X spKt/v urea (p=0.199);
- X total (p=0.358) and LDL cholesterol (p=0.347);
- X triglycerides (p=0.599);
- X serum phosphorus (p=0.492);
- X calcium-phosphorus product (p=0.677);
- X vitamin D analogues (p=0.706);
- X cinacalcet (p=0.251);
- X calcium-based phosphate binders (p=0.677);
- X medium arterial pressure pre-HD (p=0.846);
- X medium arterial pressure post-HD (p=0.617).

Variables correlated with risk of admission for severe peripheral arterial disease in univariate logistic regression:

Variable	Odds ratio	p-value
Diabetes mellitus	3.8	<0.001
Cerebrovascular disease	3.3	<0.001
Vitamin K antagonists	3	0.002
Heart failure	2.2	0.006
Charlson comorbidity index	1.3	<0.001
Age-adjusted Charlson comorbidity index	1.2	<0.001
Pulse pressure pre-HD	1.037	<0.001
Pulse pressure post-HD	1.021	0.005

No statistically significant correlation was found between PTH levels and risk of severe PAD (p=0.061).

Variables correlated with risk of admission for severe peripheral arterial disease in multivariate logistic regression:

Variable	Odds ratio	p-value
Diabetes mellitus	3.3	<0.001
Vitamin K antagonists	3.2	0.002
Cerebrovascular disease	2.7	0.001

Conclusions

In our analysis, traditional risk factors were determinant in the risk of admission for severe peripheral arterial disease. Diabetic patients were at higher risk, as shown by previous studies. Patients with cerebrovascular disease also had an increased risk, probably reflecting severity of a generalized vascular disease. Interestingly, oral anticoagulation with vitamin K antagonists also increased the risk of severe peripheral arterial disease in our cohort in an independent manner, reflecting either a drug related effect or comorbidities not accessed in the Charlson comorbidity index.

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