

## 1216 whole body angiographies. Correlations of affected vascular territories.

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### Introduction

Clinical symptoms of peripheral vascular disease (PVD) occur only in the advanced states; renal artery stenoses might lack symptoms for a long time; the same is valid for carotid artery stenoses. It is known that the prevalence of renal and carotid artery stenoses is increased if lower extremity PVD is present. If all territories shall be examined, a multi-modality approach must be chosen, including ultrasound of the carotids, and peripheral angiography (either MR angiography or DSA). This might on one hand take many days, on the other hand family physicians might be reluctant in ordering expensive examinations, and early diagnosis might thus be delayed. Whole body angiography has become possible within one setting, offering a fast, non-invasive method for screening for vascular stenoses. We reviewed 1216 whole body MR angiographies to evaluate the correlation between different affected vascular territories.

### Materials and Methods

1216 whole body MR angiographies were reviewed (mean age 56.6y). The following patient populations entered the study: prevention study with presumably healthy subjects (n=856), clinical patients (n=178), self referrals (n=28), patients of a peripheral vascular disease study (n=3), and patients with proven coronary heart disease (CHD, n=151). Whole-body MR angiography was performed with subjects feet first within the bore of the magnet; they were examined in the supine position on a rolling table platform (AngioSURF). Five 38 cm FOV slightly overlapping 3D spoiled gradient echo data sets (acquisition time 12 seconds each) are acquired in immediate succession. A 2 cm overlap between stations results in cranio-caudal coverage of 174 cm. A double dose of gadolinium-based extracellular contrast agent is given intravenously. Data acquisition is completed in merely 72 seconds. All imaging can be completed in less than 15 minutes. The grade of atherosclerotic disease was graded on a five point scale for each of the depicted vessels.

### Results

The beginning of atherosclerotic disease, as it can be depicted by MR, starts with the age of 48, with a steep increase. 332 patients showed grade 1 pathologies (atherosclerotic wall changes, stenoses <50%) in at least one vessel. Of these 332 patients 13.0% had a >50% stenosis of the internal carotid artery (ICA) and 13.3% had a >50% renal artery (RA) stenosis. Of the CHD patients, 17.9% had a RA stenosis, 12.6% had a ICA stenosis. If the presence of iliac or femoral stenoses >50% is used as a predictor for RA or ICA stenoses, the positive predictive values are as high as 20.8% and 25%, resp. Correlations of the grades of disease between the ICA, the RA, the iliac and the femoral artery were pair wise statistically significant ( $p < 0.0005$ ).

### Discussion

The outlined whole-body imaging concept is well suited to give an overview over arterial pathologies in different study groups as well as patients. This can be essential for patients at risk for dedicated diseases, as was the case in the CHD group. Clinical evaluation of renal and peripheral arteries is not sensitive for low to medium grade atherosclerotic stenoses, and therapeutic options exist for lowering the associated risks. Furthermore, patients might be convinced to lower their risk profile if systemic changes to the relevant organs can be demonstrated to them with MR imagery. Whole body MR angiography might even become a method for epidemiological questions. Further studies must be undertaken to demonstrate the potential benefits for dedicated patient populations.

<sup>i</sup> Goyen M, Quick HH, Debatin JF, et al: Whole Body 3D MR Angiography Using A Rolling Table Platform: Initial Clinical Experience. Radiology 224:270-277, 2002

