:Prevalence and distribution of atherosclerotic abnormalities in subjects aged 70 examined with whole-body MRA.

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PURPOSE: The aim of the study was to map atherosclerotic abnormalities in the whole body in a random sample of subjects aged 70.

MATERIAL AND METHODS: 303 subjects out of 1016 included in an epidemiological study (Prospective Investigation of the Vasculature in Uppsala Seniors, PIVUS) were examined in a 1.5 T scanner using its standard body coil (Gyroscan Intera scanner, gradients: amplitude 30 mT/m, rise time 200 μs, slew rate 150 mT/m/ms), using standard MobiTrak software (Philips Medical System, Best, the Netherlands). A table top extension gave a maximum total length of coverage of 171 cm. A 3D RF-spoiled gradient echo acquisition was performed at four stations prior to the injection (TR/TE / flip angle 2.9 ms/0.99 ms/30°, bandwidth 781.3 Hz/pixel, matrix size 256x256, FOV / no of slices x thickness 450 mm/60 x 4 mm). The measured voxel size was 1.76 x 1.76 x 4.0 mm, and this was reconstructed by zero-filling to 0.88 x 0.88 x 2.0 mm (volume of reconstructed voxel = 1.54 mm^3). The scan time for each station was 17 s. The table top was moved automatically with the table. Including table movement (4s x 3 = 12 s) and instructions for breath-holding, the total scan time was 87 s. 3D sequences were acquired in four stations after administration of one i.v. injection of 40 ml Gd-DTPA-BMA. Fluoroscopic triggering (Bolus Trac) was used. The arterial tree was divided into 26 different vessel segments and evaluated as either diagnostic or non-diagnostic and regarding the presence of stenosis with less or more than 50% diameter reduction, occlusions or aneurysms.

RESULTS: 7878 vessel segments were evaluated and 7827 were diagnostic (99%). On individual basis, 94 subjects (31%) had stenosis with more than 50% diameter reduction or occlusions, including 7 aneurysms. 95 subjects (31%) had no abnormalities. 112 subjects (37%) had only stenosis less then 50%, though 5 of them had aneurysms. 2 subjects had only aneurysms. 41 subjects had only one segment with a significant atherosclerotic abnormality (>50% stenosis or occlusions), 31 had two, and 22 had more than two significant atherosclerotic abnormalities. The results of the vessel segments are presented in the table.

DISCUSSION AND CONCLUSION: The study gives the prevalence and distribution of atherosclerotic abnormalities in the whole arterial tree in a population age 70. The prevalence of subjects with significant vascular abnormalities in this population was 31%. This can be compared to the paper by Goehde et al (ref 1) where they found significant vascular abnormalities in 7% of a population with an average age of 50 years using a similar technique. It can therefore be concluded that the amount of vascular abnormalities increases substantially between the ages of 50 to 70. This is of importance when considering potential future screening programs.

REFERENCES:

1: Goehde SC et al. AJR 2005 feb 184(2):598-611

	ICA	CCA	AORTA	REN	CIA	EIA	CFA	SFA	POP	TPT	ATA	PA	PTA
Normal	498	602	515	562	548	585	594	499	535	594	472	575	531
Less 50 % stenosis	92		84	34	46	13	12	92	58	6	41	12	25
More then 50 % stenosis	11			9	3	5		5	6	2	31	2	11
Occlusion	1					3		9		3	57	5	23
Aneurysm		1	6		9								
Non evaluable -motion	1			1				1		1	3	5	5
-venous filling											1	5	9
-no contrast													
-other	3		1						7		1	2	2

ICA=Internal carotid artery, CCA=common carotid artery, REN= renal artery, CIA=common iliac artery, EIA=external iliac artery, CCA=common femoral artery, SFA=superficial femoral artery, POP=popliteal artery, TPT=tibio-peroneal trunk, ATA=anterior tibial artery, PA=peroneal artery, PTA=posterior tibial artery.