Journal of Clinical & Experimental Cardiology

Aronow, J Clin Exp Cardiolog 2014, 5:9
DOI: 10.4172/2155-9880.1000e137

Editorial Open Access

Abdominal Aortic Aneurysm

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Rec date: Aug 08, 2014, **Acc date:** Aug 16, 2014, **Pub date:** Aug 25, 2014

The prevalence of abdominal aortic aneurysm (AAA) increases with advancing age, smoking, hypercholesterolemia, hypertension, male gender, and family history [1-5]. In 96 patients with an AAA, the mean age was 77 years, and 77 (80%) were men [4]. The prevalence of an AAA varies from 1.3% for men aged 45 to 54 years to 12.5% for men aged 75 to 84 years [2]. The prevalence of an AAA varies from 0% for women aged 45 to 54 years to 5.2% for women aged 75 to 84 years [2]. Of the 96 patients with an AAA, 31 (32%) were current smokers, 85 (89%) had hypertension, 78 (81%) had hypercholesterolemia, and 24 (25%) had diabetes mellitus [4].

Most patients with an AAA are asymptomatic, with their AAA noted on studies performed for other reasons rather than on physical examination. Of 96 patients with an AAA, 71 (74%) had coronary artery disease, 17 (18%) had a previous ischemic stroke, 19 (20%) had carotid arterial disease, and 37 (39%) had peripheral arterial disease of the lower extremities [4]. Of 110 men with an AAA, 71% had coronary artery disease, 46% had lower extremity peripheral arterial disease, and 27% had cerebrovascular disease [6]. The prognosis of an AAA in women is worse than in men [7].

In patients that have evidence of back, abdominal, or groin pain in the presence of a pulsatile abdominal mass, the aorta needs to be evaluated immediately, preferably with computed tomographic scanning. In one study, the mortality rates were 35% for ruptured AAAs, 26% for symptomatic AAAs, and 5% for asymptomatic AAAs undergoing repair [8]. In another study, treatment of 96 high-risk patients, mean age 72 years, with an AAA with an endovascular stent-graft prosthesis was associated with a 100% survival at 90 day follow-up [9].

The American College of Cardiology (ACCF)/American Heart Association (AHA) guidelines recommend that patients with infrarenal or juxtarenal AAAs measuring 5.5 cm or larger should undergo repair to eliminate the risk of rupture [2]. Patients with infrarenal or juxtarenal AAAs measuring 4.0 to 5.4 cm in diameter should be monitored by ultrasound or computed tomographic scans every 6 to 12 months to detect expansion [2].

Patients with an AAA should undergo intensive risk factor modification. In one study, use of angiotensin-converting enzyme inhibitors was associated with a reduced risk of ruptured AAA [10]. Of 130 patients with AAAs not treated surgically, patients treated with statins (58% of the group) had a significantly lower mortality at 45 month follow-up (5% for statin-treated patients versus 16% for patients not treated with statins) [11]. The size of the AAA was 4.6 cm at baseline versus 4.5 cm at 23 month follow-up in patients treated with statins versus 4.5 cm at baseline and 5.3 cm at 24 month follow-up in patients not treated with statins [11].

Use of statins also reduced perioperative and 2 year mortality in patients undergoing surgical AAA repair [12,13]. Of 577 patients, mean age 74 years, undergoing non-cardiac vascular surgery (98 with AAA repair), 302 patients (52%) were treated with statins [13]. Perioperative mortality or 2 year mortality occurred in 34 of 302 patients (11%) treated with statins and in 74 of 275 patients (27%) not treated with statins ($p<0.0001$). In addition, long-term statin use was associated with decreased all-cause mortality and cardiovascular mortality after successful AAA surgery in 570 patients, mean age 69 years, irrespective of clinical risk factors and use of beta blockers [14]. In this study, at 4.7 year follow-up, use of statins reduced all-cause mortality 60% ($p<0.001$) and cardiovascular mortality 70% ($p<0.0001$) [14]. Use of beta blockers reduced all-cause mortality 40% ($p= 0.003$) and cardiovascular mortality 30% ($p= 0.03$) [14].

In 400 patients ineligible for open repair of an AAA randomized to no repair or endovascular repair, at 8 year follow-up, endovascular repair was associated with a significant 47% reduction in aneurysm-related mortality but was not associated with a reduction in all-cause mortality [15].

The 2013 ACCF/AHA guidelines recommend patients with an AAA or family history of AAA who smoke should be offered smoking cessation interventions [16]. Blood pressure and serum lipids should be controlled as recommended for atherosclerotic vascular disease [16].

Patients with infrarenal or juxtarenal AAAs measuring 5.5 cm or larger in diameter should undergo repair to eliminate the risk of rupture [16].Patients with infrarenal or juxtarenal AAAs measuring 4.0 to 5.4 cm in diameter should be monitored by ultrasound or computed tomographic scans every 6 to 12 months to detect expansion [16]. Repair of an AAA can be beneficial in patients with infrarenal or juxtarenal AAAs measuring 5.0 cm to 5.4 cm in diameter [16]. AAAs smaller than 4.0 cm in diameter should be monitored by ultrasound examination every 2 to 3 years [16]. Intervention is not recommended for asymptomatic infrarenal or juxtarenal AAAs if they measure less than 5.0 cm in diameter in men or less than 4.5 cm in diameter in women [16].

In patients with abdominal and/or back pain, a pulsatile abdominal mass, and hypotension, immediate surgical evaluation is indicated. In patients with symptomatic AAAs, repair is indicated regardless of AAA diameter. Perioperative administration of beta blockers in the absence of contraindications is indicated in patients with coronary artery disease undergoing surgical repair of atherosclerotic AAAs [16].

Open or endovascular repair of infrarenal AAAs and/or common iliac aneurysms is indicated in patients who are good surgical candidates. Periodic long-term surveillance imaging should be performed to monitor for an endoleak, to detect shrinkage or stability of the excluded aneurysm sac, and to determine need for further

intervention in patients who have had endovascular repair [16]. Open AAA repair is reasonable in patients who are good surgical candidates who cannot comply with the periodic long-term surveillance needed after endovascular repair [16].

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