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PREVALENCE, DOCUMENTATION AND FOLLOW-UP OF INCIDENTAL ABDOMINAL AORTIC ANEURYSMS IN MALTA

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Abstract

Incidental abdominal aortic aneurysms (AAAs) are significant findings in terms of monitoring and surgical intervention to reduce morbidity and mortality. The prevalence of incidental AAAs and their management have not been extensively studied and no such study has been done in Malta. A stratified random sample of 420 imaging studies conducted between January and June 2014 at Mater Dei and Gozo General Hospitals was electronically screened for evidence of AAA. Medical records of patients with screen-positive reports were reviewed to determine whether the incidental AAA was documented, a follow-up study/treatment was planned, and whether it was communicated to the patient's family doctor through the discharge letter. There were six AAA-positive studies in the sample (1.4%). Three of these were incidental AAAs (0.73%). Patients with AAAs were elderly (mean age, 71.5 +/- 9.4 years) and 83.3% were male (N=5). The mean diameter of all AAAs in the sample was 5.2 +/- 2.6 cm, compared to a mean of 3.45 +/- 0.25 cm for the incidental AAAs. The incidental finding of AAA was documented in the medical notes of only 33.3%. There was no follow-up/treatment plan mentioned in two of the three (66.7%) newly diagnosed patients with AAAs. The finding of incidental AAA was communicated to the family physician through the discharge letter in 100% of inpatients, whereas no documentation was found for outpatients. The prevalence of incidental AAAs in Malta is significant and comparative to other international studies, however documentation and follow-up planning need improvement. Large-scale population-based studies are called for.

Keywords*: prevalence, abdominal aortic aneurysm, Malta, incidental finding*

Introduction

Incidental abdominal aortic aneurysms (AAAs) are detected during imaging for other purposes. These abnormalities are not uncommon, identified in 1% - 2% of the abdominal imaging procedures in several studies. Patients derive significant health benefit from the identification of benign AAAs because of their natural history with progressive enlargement up to sudden rupture and death [1, 6-9].

For small aneurysms the reported average growth rate ranges from 0.2 to 0.3 cm per year. However larger AAA diameters are associated with higher AAA growth rates [3, 4, 11-13]. Level 1 American Heart Association evidence strongly recommends ultrasound or computed tomographic monitoring for AAA 4 - 5.4 cm at 6-12 monthly intervals [14].

Although radiological monitoring is fundamental, patient benefit will only be derived as long as they are monitored and repaired, when indicated, to prevent rupture. There is significant evidence to show that incomplete incidental AAA monitoring is significantly associated with a decreased risk of elective AAA repair and an increased risk of death [3, 15-16].

Materials and Methods

This retrospective cross-sectional study was carried out at Mater Dei and Gozo General Hospital, the largest two main public teaching hospitals in the Maltese islands. All patients who under¬went abdominal imaging with a computerized tomography scan or an abdominal ultrasound at Mater Dei and Gozo General Hospitals between January 2014 and June 2014 were eligible for in-clusion. Data was collected retrospectively from the Picture Archiving and Communication System (PACS) imaging and reporting software. A stratified random sample was created via computer-generated randomisation (Chart 1). We manually reviewed a total of 420 random imaging study reports for evidence of AAA. Half of the studies (210) were abdominal computed tomography (CT) and the other half were ultrasound abdomen (US).

We defined incidental AAA as dilatation of the abdominal aorta of 3 cm or more in a patient who had imaging for a reason other than symptoms or signs of AAA and is not known to suffer from AAA. We identified this by reviewing the CT/ US indication documented by the requesting physician and reviewing all previous abdominal imaging studies, discharge letters and medical records for a reported AAA. For all AAAs detected we reviewed each patient's abdominal imaging reports to identify the maximal diameter and location of the AAA. From the hospital's PACS information system, we determined the patient's age, sex and location when the AAA was iden¬tified (i.e., outpatient or during hospi¬tal stay).

At Mater Dei and Gozo General Hospitals, a copy of the imaging report is routinely sent to the ordering physician and a report is included in the patient's discharge letter. From the medical records of hospital in-patients, we determined whether the AAA was documented, a follow-up study or treatment was planned, and whether it was communicated to the patient's family doctor through the discharge summary.

We used the American Heart Association evidence-based recommendation schedule to determine the adequacy of AAA monitoring. We also assumed that all screen-negative reports did not have an AAA.

Results

There were a total of six AAA-positive studies in the sample (1.4%). Three of which were incidental AAAs (0.73%) – two positive USs and a positive CT study. The other three positive studies were follow-up or re-assessment CT imaging for previously identified incidental AAAs (0.73%).

Patients with AAAs were elderly (mean age, 71.5 +/- 9.4 years) and 83.3% were male (N=5). The mean diameter of all AAAs in the sample was 5.2 +/- 2.6 cm, compared to a mean of 3.45 +/- 0.25 cm for the incidental AAAs in the sample. Five of the six AAAs were infrarenal in location (83.3%), and one was thoracoabdominal.

Two-thirds of the incidental AAA-positive studies were performed as outpatient and one study (33.3%) was done on an admitted patient. The incidental finding of AAA was documented in the medical notes of only one of the three patients (33.3%) with incidental AAA-positive scans.

There was no follow-up or treatment plan mentioned in two of the three (66.7%) newly diagnosed patients with AAAs; one with a borderline aneurysm and the other with a metastatic disease.

The finding of incidental AAA was communicated to the family physician through the discharge letter in all inpatients, whereas no documentation was found for outpatients.

Discussions

In literature, incidental AAAs were detected in around 1% of all abdominal imaging

procedures [1]. In our study, the prevalence of incidental AAAs was 0.73%.

In our study there was a strong male predisposition to AAA; 83.3% being male (N=5), which corresponds to the 5:1 male–female ratio illustrated in previous studies [2, 6]. Although a seemingly protective factor, there is evidence that the female sex devise a worse prognosis. Sex is an independent predictor factor of growth rate; for a given diameter, the time to rupture is less in women than in men - documented as 4-fold that of men in a meta-analysis. Hence the rupture risk of a 5.5-cm AAA in men might carry a similar risk to that of a 5.2-cm AAA in women [2, 17].

The prevalence of AAA in men younger than 65 years is about 1% and increases by 2% to 4% per decade. Several reports showed that the prevalence of AAA ranged between 4% and 8% for men older than 65 years [3, 19]. The patient population in this study were elderly, with a mean age of 57.3 years. The mean age of patients with AAA was 71.5 years. Likewise, our study confirmed that the incidence of AAA substantially increased with age.

Aortic aneurysm rupture is the most serious outcome of AAA with a mortality rate of 50% in patients who survive long enough to reach the hospital compared with 1-5% mortality with elective repair [18].

83.3% of AAAs in our study were infrarenal, with a mean AAA diameter of 5.2 cm, compared with a mean diameter of 3.45 +/- 0.25 cm for the incidental AAAs. In several reports, AAAs measuring <5 cm are estimated to rupture at a rate of <1% per year, rising to approximately 10% per year for those >6 cm. It is estimated that 60% to 80% of AAA between 4 and 4.9 cm will enlarge and require surgery within 5 years [3]. It is stated that the most accurate independent positive predictor of expansion rates is the initial AAA diameter and this is used to determine the intervals between follow up imaging assessments. Expansion rates are also thought to predict rupture in some studies which herald the need for incidental AAA monitoring [4, 5].

Aneurysm screening on the other hand even has more potential for benefit as it significantly reduces the risk of AAA-related mortality by approximately 50% in men [20]. Interesting to note that in men aged 65 years and over the risk of death within 30 days of elective surgery with a screen-detected AAA was one-third that of men with an incidentally detected aneurysm [5].

The following class 1 recommendation is taken from The American College of Cardiology/American Heart Association: "Patients with infrarenal or juxtarenal AAAs measuring 4.0 to 5.4 cm in diameter should be monitored by ultrasound or CT scans every 6 to 12 months to detect expansion"[14].

When the surgical threshold is reached, operative treatment should be implemented. Surgical intervention is clearly indicated when the AAA diameter has reached >5.5 cm (although less in women). Another indication for repair in several institutions is a growth at a rate exceeding 1 cm per year. Likewise emergency repair is always indicated for AAA rupture [2-4, 11].

Numerous studies indicate that incidental AAAs are frequently not recognized or monitored properly [1, 15]. In our study the incidental finding of AAA was documented in the medical notes and communicated to the family physician through the discharge letter of only one third of patients (33.3%) of AAA-positive scans.

They may be inadequately monitored for several reasons. Doctors order these imaging studies for other, often serious indications which might have caused them to overlook the AAA identified. Nevertheless lack of monitoring of these AAA could only be justified in patients who are deemed not to be candidates for surgical AAA repair. Poor monitoring significantly decreased the possibility that patients underwent elective AAA repair [1, 8, 15].

Due to the relatively high number of incidental AAA, and high potential for patient benefit, several interventions should be implemented to improve the monitoring of incidentally identified AAAs. The radiologist can directly alert the physician about identi¬fication of an AAA. A copy of the report identifying the incidental AAA should be sent to the patient's family physician, along with recommen¬dations for frequency monitoring.

Patients with no family physician should be automatic¬ally booked for follow-up abdominal imaging within the recommended

timeframe and referred to a vascular surgeon. Finally, an information leaflet could be provided to the patient explaining the incidental AAA, its implications and recommended actions.

Conclusion

In line with the previous studies, the prevalence of incidental AAAs in Malta is comparatively common. They are frequently not documented by the hospital physician and are poorly communicated to the family physician which will eventually lead to poor monitoring and its devastating consequences. Large-scale studies are suggested to further examine the monitoring and management of incidental AAAs in Malta and the region. The impact of population-based screening for AAA warrants attention.

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