Original Article

Prevalence of Abdominal Aortic Aneurysm by Magnetic Resonance Images (MRI) in Men over 50 years with low back pain

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Received: October 11, 2008 Accepted: November 18, 2008

ABSTRACT

Objective: This study was aimed at evaluating the prevalence of Abdominal Aortic Aneurysm (AAA) in men older than 50 years with a complaint of low back pain, employing MRI technique

Patients and Methods: In a cross-sectional study, 600 men older than 50 years with low back pain evaluated by MRI were assessed during a 12-month period. A diameter of abdominal aorta more than 3 cm was considered as aneurysm. Patients were divided in two groups: group A without an evidence of lumbar disc herniation on MRI (300 patients); and group B with lumbar disc herniation (300 patients). History of smoking was determined in all patients.

Results: Mean age was 60.05±8.81 (50-84) years. Positive history of previous or current smoking was found in 185 (30.8%) patients. AAA was detected in 7 (1.2%) patients, 3.2% and 0.2% of smokers and non-smokers, respectively (p=0.004, OR=13.9). There were 5 (1.7%) and 2 (0.7%) cases with AAA in groups A and B, respectively (p=0.287). In group B, 1% and 0.5% of patients with and without a positive history of smoking had AAA, respectively (p>0.05).

Conclusion: This study showed that the prevalence of AAA in elderly men with low back pain is similar to their counterparts without a complaint of low back pain. On the other hand, smoking was a risk factor for AAA. Screening of AAA in men older than 50 years with low back pain who smoke may be advisable. (Rawal Med J 2009;34:1-3).

Keywords: Abdominal Aortic Aneurysm, Low Back Pain, MRI.

INTRODUCTION

Abdominal aortic aneurysm (AAA) is generally a disease of older Caucasian men.[1] This condition is turning into a life-threatening disease, especially in developed countries.[2] AAA is often found as

an incidental diagnosis in individuals undergoing sonography, CT-scan, or MRI for other reasons.[3] Morbidity and mortality rate in emergency and elective surgeries are high and screening programs and an early diagnosis are desirable. AAA and lumbar disk herniation (LDH) share two main risk factors, smoking and aging.[1] As patients with low back pain (LBP) routinely undergoing MRI, we undertook this study to determine the prevalence of AAA in individuals over fifty years old with LDH.

PATIENTS AND METHODS

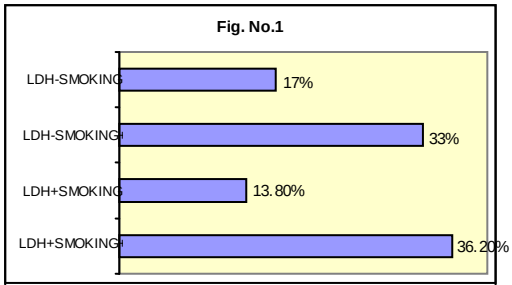
In this descriptive analytic cross-sectional study, 600 male patients over 50 years age referred to the Neurosurgery Clinic for LBP or the Radiology Center for MRI from July 2006 to July 2007 were included. The study was performed at Imam Hospital, Tabriz University of Medical Sciences. All patients were interviewed to determine a history of smoking and its period and frequency, any familial diseases, and any previous treatments received. The aortic diameter adjacent to L_3 and L_4 vertebrae was measured in transverse and anterior-posterior (AP) sections.

The condition of lumbar disks was graded as follows: Grade 1: Disk bulging (bulging sound anular fibrosis), Grade 2: Disk protrusion (bulging limited to a portion of anular fibers), Grade 3: Disk extrusion (bulging progression with destruction of anular fibers but a sound disk) and Grade 4: Disk sequestration (scoping of a portion of neucleus pulpusous). First and second conditions were considered as low grade, while third and fourth were considered as high grade. Aneurysm was defined as an increase in the aortic diameter to above 3 cm in transverse or AP section.

Statistical analysis: Student's t-test for evaluation of quantitative variables and Chi-square test or Fisher's Exact test for evaluation of categorical variables using contingency tables were used. SPSS 13.0 software was used for the analysis of data. The significance level was determined as $P \leq 0.05$.

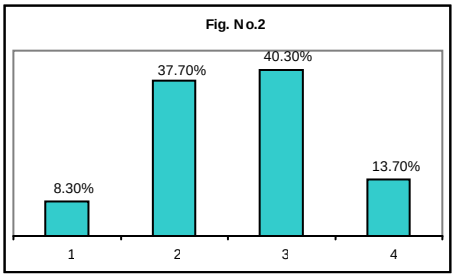
RESULTS

Six-hundred male patients over 50 years old with LBP undergoing MRI had mean age of 60.05± 8.81 years (range, 50 to 84). A familial history of AAA was not found in any of the patients. Mean aortic AP diameter was 18.01±3.48 mm (range 12 to 35) and mean transverse diameter was 19.82±3.76 mm (range 12.7 to 33). 185 patients (30.8%) had a history of smoking and 300 (50%) had LDH. The mean age of patients with LDH was significantly higher than those without LDH (61.06±8.90 years, (range 50 to 84) vs. 59.04 ± 8.61, (range 50 to 84), respectively; $P = 0.005$). Mean aortic AP diameter was significantly higher in patients with LDH than those without LDH (19±3.26 mm vs. 17.03±3.43 mm, respectively; $P < 0.001$).



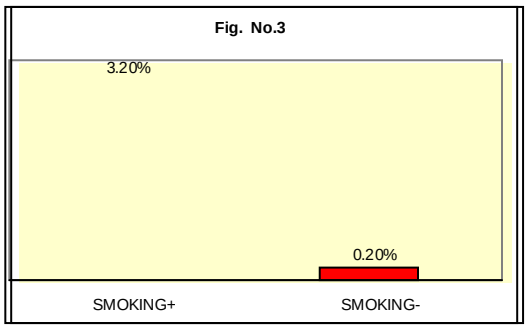
Prevalance of patients based on presence of LDH and smoking

Mean smoking period in patients with a positive history of smoking was 22.09±13.42 years. Mean age of smokers was 59.30±8.70 (range, 50 to 84) and mean age of non-smokers was 60.39±8.85 (range, 50 to 84); (P = NS). Mean aortic transverse diameter was significantly higher in smokers compared to non-smokers (20.05±3.99 mm vs. 18.93±3.60 mm, respectively; P = 0.001) (Fig. 1).



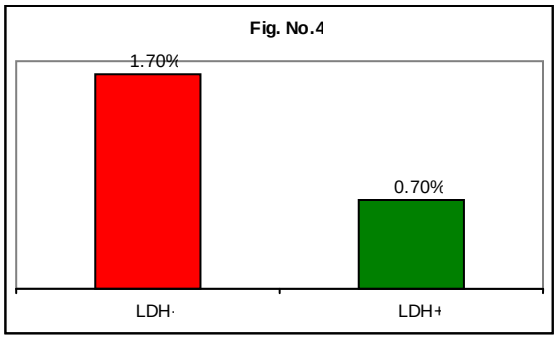
Prevalence of grades of LDH.

Of 300 patients with LDH, 162 patients (54%) had low-grade and 138 patients (46%) had high-grade LDH (Figure 2). There were no significant differences between the mean age of patients with low-grade and high-grade LDH (60.02±8.60, range 50 to 84 vs. 62.07±9.20, range 50 to 84, respectively; P = 0.069). Mean aortic AP diameter in patients with low-grade LDH was 18.94±3.59 mm and in patients with high-grade LDH it was 19.03±2.83 (P = NS).



Prevalence of AAA patients based on smoking history.

AAA was observed in 7 patients, six of which had a positive history of smoking (OR = 13.9, P = 0.004) (Fig. 3). Mean age of patients with AAA was significantly higher than those without AAA (72.29±4.90 years, range 66 to 80 vs. 59.91±8.75, range 50 to 84, respectively; P < 0.001). In patients with LDH, AAA was seen in 2 cases and in patients without LDH, it was seen in 5 cases (P = 0.287) (Fig. 4).



Prevalence of AAA patients based on LDH

The following results were observed considering the severity grade of LDH and presence of AAA: In LDH grade 1, no aneurysm was found; in LDH grade 2, there was one case of aneurysm; in LDH grade 3, one case; and in LDG grade 4, no aneurysm was seen (P = NS).

DISCUSSION

AAA was found in 7 patients (1.2%). In patients without LDH, 5 cases (1.7%) and in patients with LDH, 2 cases (0.7%) had aneurysm (P = 0.287). Gouliamos et al, using CT-scan for the evaluation of 100 male and female patients with LBP as cases and 850 subjects as the control group in Greece, found AAA in three male subjects of the case group (3%), while 2% of the controls showed AAA.[5] Prevalence of AAA in the Netherlands population has been reported to be 8.1% and 6% in Brazilian men over 60 year age.[7] The presence of few reports[8,13] on coincidence of LBP and AAA reveal that this abnormality is an uncommon cause for LBP. Henderson also concluded that although AAA is an uncommon cause for LBP.[10] Our findings indicate that the prevalence of AAA in men over 50 years age is same as seen in other parts of the world (1.7-8.2%). It seems reasonable to implement a screening program for older men with LBP for its early diagnosis.

In the present study, the prevalence of AAA was significantly higher in patients with present or past history of smoking compared to patients without a history of smoking (P = 0.004). Smoking has been considered as one of the risk factors of AAA.[14] The prevalence of AAA in patients with

coincidental LBP and LDH with or without a history of smoking was less than those without LDH; however, this difference was not significant. No associations were observed between the prevalence of AAA and severity of LDH in the present study. There are, however, no other studies comparing these variables. In conclusion, the prevalence of AAA in men over 50 years age with LBP was about 1.2%. The prevalence in smoker men over 50 years old with LDH was about 1%. Considering the findings of the present study, it seems that screening of older men with LBP for AAA, especially in smokers or patients with a recent history of smoking, is advantageous. Further studies are needed to determine the best modality and the most feasible method of screening.

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