



Can Family History Be Used As a Predictor in Patients with Suspected Acute Appendicitis at the Emergency Department?

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Received: January 28, 2014
Revised: February 10, 2014
Accepted: February 26, 2014

Please cite this paper as:

Heydari A, Emami Zeydi A. Can Family History Be Used As a Predictor in Patients with Suspected Acute Appendicitis at the Emergency Department? *Bull Emerg Trauma*. 2014;2(2):99-100.

Dear Editor,

Acute abdominal pain is one of the most common complaints of patients presenting to emergency department (ED). When patients who present to the ED with a complaint of acute right lower quadrant (RLQ) pain of the abdomen, an emergency physician faces the challenge of considering acute appendicitis (AA) as a possibility [1]. AA is the most common cause of an acute abdomen that requires surgical intervention with a life-time risk of about 7% [1,2]. Despite technological advances, diagnosis of appendicitis is still primarily based on the patient's history and physical examination [3]. Since, many symptoms of appendicitis overlap with a number of other gastrointestinal or genitourinary diseases [1,2], therefore, accurate and timely diagnosis of AA remains clinically challenging and one of the most commonly missed problems in the EDs. Misdiagnosis of presumed appendicitis or precaution appendectomy is an adverse outcome that leads to unnecessary surgery, serious interruption of patient's daily activities and considerable waste of hospital resources, in addition to the recognized postoperative complications [4]. Although, in patients of misdiagnosis or delayed diagnosis, possible complications including sepsis, abscess, peritonitis, intestinal obstruction and ultimately, death, may occur [1,2]. It has been reported that 1 of 5 cases of appendicitis is misdiagnosed; however, a normal appendix is found in 15-35% of

patients who have emergency appendectomy [4]. In order to reduce the negative appendectomy rate and to help making the diagnosis of acute appendicitis easier, in addition to physical examination, various predictive indicators and techniques including different scoring systems, laboratory studies and radiological imaging have been applied [5]. There have been attempts to improve these findings using ultrasonography or Computed Tomography (CT) scans to reduce the amount of missed appendicitis cases and unnecessary surgery. Ultrasonography has a high sensitivity, but it is technician dependent and its value is limited in the evaluation of abnormally located appendix, such as a retrocecal or a ruptured appendix. CT scan is more sensitive than ultrasonography with higher comparable specificity. However, recently the food and drug administration (FDA) has raised concerns about the increased use of CT scans exposing the public to risky levels of radiation [6]. Also such expertise is not routinely available for emergency situations and fast accessibility to these services may not be available [7]. In patients with suspected appendicitis while their final pathology, hospital course and CT scan reports were retrospectively reviewed, Petrosyan *et al.*, [8] showed that the preoperative CT scans did not decrease the negative appendectomy rate in these patients. In another study by Martin *et al.*, [9] conducted on children with a diagnosis of appendicitis, it was demonstrated that the liberal use of CT scans in diagnosis of appendicitis has not

resulted into a decreased negative appendectomy rate. They concluded that potentially dangerous radiation exposure should prompt surgeons to reevaluate the role of CT scanning in the management of children with suspected appendicitis. Therefore we need to have criteria on a clinical basis to diagnose or exclude AA, so that unnecessary negative appendectomy rate could be kept to the minimal amount possible [7].

Family history is an important factor for risk stratification in various diseases. In a prospective study by Drescher *et al.*, [10] with aim to compare positive family history with the diagnosis of AA in a sample of adults, the findings revealed that adults with a known family history of appendicitis presenting to the ED were more likely to have appendicitis than those without. In a retrospective study by Ergul *et al.*, [11] conducted on medical records of 2670 patients who were referred as acute abdominal pain by general practitioners, with aim to assess the association between family history and the occurrence of AA, the results denoted to the fact that family history was an important parameter for the prediction of AA. Also, the results of a large scale study in Japanese families showed that about 20% of children with one parent and also about 40% of children with both parents may develop AA during childhood [12]. Gauderer *et al.*, [13] have shown that children who had appendicitis were twice as likely to have a positive family history to children with RLQ pain (but no appendicitis) and almost 3 times as likely to have a positive family history to those in surgical controls (without abdominal pain). They concluded that due

to the potential value of family history in changing the threshold for intervention, a careful family history should be obtained for every child in whom AA is suspected. Moreover, another retrospective study of patients taken to the operating room for appendectomy, which compared those having appendicitis to those without, showed an increased incidence of family history in patients with appendicitis versus those without, with a greater difference in those younger than 20 years, for which family history was positive in 45% of cases with appendicitis versus 17% of cases without [14]. Also, Arnbjornsson (1982) [15] and Andersson *et al.*, [16] showed a high incidence of appendicitis among immediate family members. The familial tendency to acute appendicitis may be explained by environmental factors such as a specific bacterial infection, certain food habits such as low fiber intake that could play an important role in pathogenesis of acute appendicitis and it probably is the cause in 70% of the cases or a genetic difference in resistance to bacterial infection [1].

So considering the results of previous studies regarding the importance of family history as a parameter in predicting AA in suspected patients, it seems that the knowledge of family history of appendicitis, in combination with other clinical and laboratory findings, can assist an emergency physician in determining the likelihood of the diagnosis in patients with suspected AA at the ED. Future research in this regard is warranted.

Conflict of Interest: None declared.

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