HRB Centre for Primary Care Research
Research Briefs

Clinical Prediction Rules

The value of the Alvarado score in predicting acute appendicitis

HRB CENTRE FOR PRIMARY CARE RESEARCH

ROYAL COLLEGE OF SURGEONS IN IRELAND
COLÁISTE RÍOGA NA MÁINLEÁ IN ÉIRINN

RCSI

Queen's University Belfast

HRB Health Research Board

TRINITY COLLEGE DUBLIN

123 St Stephen's Dublin 2, Ireland

Clinical prediction rules (CPRs) are designed to assist clinicians in stratifying patients according to their probability of having a specific target disorder based on the patient's history and the clinical examination. The Health Research Board (HRB) Centre for Primary Care Research (www.hrbcentreprimarycare.ie) has recently published an important systematic review that examines the utility of the Alvarado score in predicting acute appendicitis.

The HRB Centre for Primary Care Research supports placements for medical students during the summer months each year. In 2009-2010, under the supervision of Professor Tom Fahey and his team, medical students Robert Ohle and Fran O'Reilly participated in a systematic review of validation studies of the Alvarado score, published recently in *BMC Medicine* [1].

_____

We can be found at:

HRB Centre for Primary Care Research
Department of General Practice
Royal College of Surgeons in Ireland
123 St. Stephen's Green
Dublin 2, Ireland

tel: +353-1-4022473
email: hrbcentre@rcsi.ie
www.hrbcentreprimarycare.ie

Clinical Prediction Rules

The value of the Alvarado score in predicting acute appendicitis

Acute appendicitis is the most common cause of an acute abdomen requiring surgery, with a lifetime risk of about 7%. In 1986, Alvarado constructed a 10-point clinical scoring system, also known by the acronym MANTRELS, for the diagnosis of acute appendicitis based on symptoms, signs and diagnostic tests (migration of pain, anorexia, nausea, tenderness in right lower quadrant, rebound pain, elevated temperature, leucocytosis, shift of white blood cell count to the left). The Alvarado score enables risk stratification in patients presenting with abdominal pain, linking the probability of appendicitis to recommendations regarding discharge, observation or surgical intervention. However, because of high costs and variable availability of imaging procedures such as CT scan or ultrasound, CPRs such as the Alvarado score may be a valuable diagnostic aid, particularly in low-resource countries.

Our review assessed the discrimination (diagnostic accuracy) and calibration performance of the Alvarado score using data from 42 validation studies. The cut-off <5 points was good at 'ruling out' the admission for appendicitis. At the cut-off ≥7 points, recommended for 'ruling in' appendicitis and progression to surgery, the score performed less well. Our conclusion is that the Alvarado score with the cut-off <5 points is a useful clinical prediction tool in 'ruling out' acute appendicitis. If implemented as a rule, it could safely prevent unnecessary hospital admissions in these patients. Dr Borislav Dimitrov commented that if the Alvarado score is more widely applied in clinical practice, it may enhance the accuracy of diagnosis and provide a more cost-effective way of patient management.

This review will contribute to the ongoing work at the HRB Centre for Primary Care Research in the development of an international register of clinical prediction rules relevant to primary care. The web-based register will be made publicly available in 2012 through the Cochrane Primary Health Care Field (www.cochraneprimarycare.org).

Professor Tom Fahey, Principal Investigator at the HRB Centre highlights the value of undergraduate students engaging in research in a supportive environment. Professor Fahey said "This important review demonstrates that with some guidance, undergraduate medical students can make a positive contribution to evidence-based medicine. In addition to developing research skills, these placements promote life-long learning by encouraging critical appraisal of medical literature".

The article can be viewed at:

[1] Ohle R, O'Reilly F, O'Brien KK, Fahey T, Dimitrov BD. The Alvarado score for predicting acute appendicitis: A systematic review. *BMC Medicine* 2011; 9: 139. (www.ncbi.nlm.nih.gov/pubmed/22204638)