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ORIGINAL ARTICLE

The RIPASA score for the diagnosis of acute appendicitis: A comparison with the modified Alvarado score☆

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KEYWORDS
Appendicitis;
RIPASA scale;
Modified Alvarado score;
Sensitivity;
Specificity

Abstract
Introduction and objectives: Acute appendicitis is the first cause of surgical emergencies. It is still a difficult diagnosis to make, especially in young persons, the elderly, and in reproductive-age women, in whom a series of inflammatory conditions can have signs and symptoms similar to those of acute appendicitis. Different scoring systems have been created to increase diagnostic accuracy, and they are inexpensive, noninvasive, and easy to use and reproduce. The modified Alvarado score is probably the most widely used and accepted in emergency services worldwide. On the other hand, the RIPASA score was formulated in 2010 and has greater sensitivity and specificity. There are very few studies conducted in Mexico that compare the different scoring systems for appendicitis. The aim of our article was to compare the modified Alvarado score and the RIPASA score in the diagnosis of patients with abdominal pain and suspected acute appendicitis.
Material and methods: An observational, analytic, and prolective study was conducted within the time frame of July 2002 and February 2014 at the Hospital Universitario de Puebla. The questionnaires used for the evaluation process were applied to the patients suspected of having appendicitis.

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Results: The RIPASA score with 8.5 as the optimal cutoff value: ROC curve (area .595), sensitivity (93.3%), specificity (8.3%), PPV (91.8%), NPV (10.1%). Modified Alvarado score with 6 as the optimal cutoff value: ROC curve (area .719), sensitivity (75%), specificity (41.6%), PPV (93.7%), NPV (12.5%).
Conclusions: The RIPASA score showed no advantages over the modified Alvarado score when applied to patients presenting with suspected acute appendicitis.

PALABRAS CLAVE
Apendicitis;
Escala RIPASA;
Escala Alvarado modificada;
Sensibilidad;
Especificidad

Escala RIPASA para el diagnóstico de apendicitis aguda: comparación con la escala de Alvarado modificada

Resumen
Introducción y objetivos: La apendicitis aguda es la primera causa de las urgencias quirúrgicas. Permanece como un diagnóstico difícil de establecer, particularmente entre jóvenes, ancianos y mujeres en edad reproductiva, en los cuales una serie de condiciones inflamatorias pueden presentar síntomas y signos similares a los de la apendicitis aguda. Diversos sistemas de puntuación se han creado con el fin de incrementar la certeza diagnóstica; estos son baratos, no invasivos y fáciles de usar o reproducir. La escala de Alvarado modificada es probablemente la más difundida y de mayor aceptación en los servicios de urgencias del mundo. Por otro lado, la escala RIPASA fue elaborada en 2010 con mejor sensibilidad y especificidad. En México se encuentran pocos estudios que comparen los diversos sistemas de puntuación en apendicitis. El objetivo es comparar la escala de Alvarado modificada y la escala RIPASA para el diagnóstico de pacientes con dolor abdominal y sospecha de apendicitis aguda.
Material y métodos: Se realizó un estudio observacional, analítico y prolectivo, de julio de 2012 a febrero 2014 en el Hospital Universitario de Puebla. Las encuestas en proceso de evaluación fueron aplicadas a los pacientes con sospecha clínica de apendicitis.
Resultados: Escala de RIPASA: curva ROC/PC 8.5 (área 0.595), sensibilidad (93.3%), especificidad (8.3%), VPP (91.8%), VPN (10.1%). Escala de Alvarado modificada: Curva ROC/PC 6 (área 0.719), sensibilidad (75%), especificidad (41.6%), VPP (93.7%), VPN (12.5%).
Conclusiones: La escala de RIPASA contrastada con la escala de Alvarado modificada no mostró ventajas al aplicarse a pacientes con sospecha de apendicitis aguda.

Introduction and aims

Acute appendicitis is the first cause of surgical emergencies worldwide, with an incidence of 1.17 to 1.9 per 1,000 inhabitants per year and a lifetime risk of presenting with it of 8.6% in men and 6.7% in women. The most common age range is 25-35 years of age.[1,2]

Despite its being a common health problem, the diagnosis of acute appendicitis is still difficult to make, especially in young persons, the elderly, and in reproductive-age women. Various genitourinary or gynecologic inflammatory conditions can present with signs and symptoms similar to those of acute appendicitis.[3] Diagnosis is based purely on the clinical history and physical examination, combined with the results of laboratory studies, such as a high white cell count.[4]

Late appendectomy to improve diagnostic accuracy increases the risk for appendicular perforation and sepsis, augmenting morbidity and mortality (surgical site infection 8-15%, perforation 5-40%, abscesses 2-6%, sepsis and death 0.5-5%).[1,3] In contrast, premature diagnosis of appendicitis leads to reduced diagnostic accuracy with a consequent rise in negative or unnecessary appendectomies that have been reported at approximately 20-40%.[3] Ultrasound and tomography imaging can improve diagnostic accuracy, but are expensive and not always available at healthcare centers.[3,5]

Different scoring systems have been created to increase the diagnostic accuracy of appendicitis that are low-cost, noninvasive, and easy to use or reproduce.[4,5] They assign numerical values to define signs and symptoms. Clinical signs of abdominal pathology (type, pain location and migration, temperature, signs of peritoneal irritation, nausea, and vomiting, among others) and laboratory findings (leukocytosis) are generally used.[5]

The modified Alvarado score is probably the most widely used and accepted at emergency services, worldwide, with 68-82% sensitivity and 75-87.9% specificity[1,5] (Table 1). It classifies patients with abdominal pain in the right iliac fossa into 3 groups of appendicitis probability: a) low risk