

Chapter 1
Introduction



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Abdominal pain is one of the most common chief complaints in emergency patients. According to the statistics collated on emergency department visits ¹ between 2002 and 2007, abdominal pain and chest pain continue to be the most common cause of emergency department visits. A study conducted at a university hospital in Thailand found that abdominal pain was the second most common cause of unscheduled emergency room return visits within 48 hours between August 2009 and July 2010.²

Although abdominal pain is a common emergency problem, management of the presenting condition is not simple. There are not only numerous possible diagnoses in each patient, but also a wide-range of the possible severity of any condition. Some diseases are only trivial, self-limiting conditions but some diseases are fatal if not properly treated.

1. Challenges in diagnosis

Diagnosis of acute abdominal pain is challenging, because the possible outcome for the patient is closely related to the accuracy of the diagnosis and the timely nature of the treatment. Approximately 50% of patients are discharged from the emergency room without a specific diagnosis.³ While these patients may need no other treatment than a short period of observation, urgent treatment may be needed for patients with more serious conditions. If surgery is required, any delay may result in a much more severe outcome for the patient.⁴

Among acute abdominal pain patients, diagnosis of lower abdominal pain or pelvic pain in a young adult female is very complicated. The difficulties in diagnosis in these patients are twofold. Firstly, female reproductive organs are located inside the pelvic cavity. Any disturbance to these organs, either pathological or physiological, may cause pain to the patients. Diseases associated with the alimentary tract and urological conditions also cause symptoms of lower abdominal pain in young adult females as well.

The second difficulty relates to the first one. As mentioned earlier, either gynecological or surgical conditions may be the cause of abdominal pain in a young adult female. Therefore, a complete diagnosis usually requires the involvement of more than one specialism and often more sophisticated investigation. This sometimes results in delayed diagnosis and delayed treatment.

The magnitude of problems in diagnosis of lower abdominal pain or pelvic pain in young adult females, which result in misdiagnosed as appendicitis, has been recognized for

almost 40 years. A study conducted in 1975 reviewed 1000 cases of appendicitis seen from 1968 to 1973.⁵ The authors found that the overall negative appendectomy rate was 20%; but in young women (20 to 40 years old) negative appendectomy rate was higher than 40%. Wen and Naylor demonstrated that from 1981 to 1991, accuracies in the diagnosis of appendicitis in females had been increasing from 71.7% to 75.3%; however, they were still lower than diagnostic accuracies in males during the same period that were relatively constant approximately 89%.⁶ The same study also found that the rate of perforated appendicitis in female had increased from 17.5% to 21.6 % during the same period. The authors concluded that for each 10% increase of diagnostic accuracy rate, the perforation rate increased 14%.

Aside from appendicitis, gynecological conditions are frequent causes of lower abdominal pain in young adult females. The most common urgent conditions are pelvic inflammatory disease, ruptured ovarian cysts and appendicitis⁷. In addition to these, ectopic pregnancy is an important consideration in differential diagnosis because it occurs in 1.9 % of pregnancies and it is the leading cause of pregnancy-related death in the first trimester.⁸

Theoretically, a young adult female may need 3 to 4 specialists to evaluate her lower abdominal pain: an emergency physician, a gynecologist, a general surgeon and a radiologist. Although this is possible in a large hospital, consultations and special investigations increase diagnosis accuracy at costs of time and resources. Therefore, an increase in accuracy of diagnosis using a clinical profile may be more appropriate in a low-income country with lower medical budgets such as Thailand.

2. A different perspective

The conventional approach to diagnosis of acute lower abdominal pain in women of reproductive age concentrates on increasing diagnostic accuracy via special investigations. Ultrasound, helical computerized tomography, magnetic resonance imaging and laparoscopy are all carried out and the results or images studied to increase diagnostic accuracy.⁹⁻¹⁴ However, the importance of accurate triage of patients with recommendations to consult the appropriate specialist is less studied. Although clinical prediction rules are close to this approach, they have been developed for the diagnosis of single diseases only.^{15, 16} Present knowledge suggests there has been no study into the clinical prediction of multiple diagnoses

in a single study domain. So the application of presenting clinical prediction rules for abdominal pain in women of reproductive age is limited to the diagnosis of a single disease rather than for all common diagnoses.

3. Aims of this thesis

The aim of this thesis is to create a set of new clinical prediction rules that can be used for the diagnosis of common conditions that cause acute lower abdominal pain in women of reproductive age. These new clinical prediction rules can help physicians to direct patients for appropriate consultation or appropriate further investigation. Knowledge gained from the studies in this thesis, which has already transformed the clinical judgment of specialists in a large university affiliated hospital into a series of clinical diagnostic prediction rules, would help both general practitioners in rural hospitals and emergency physicians, in the differential diagnosis of common gynecological conditions and appendicitis in this particular group of patients.

4. Summary

Abdominal pain is one of the most common chief complaints seen in patients who come to emergency departments. Diagnosis and management of acute lower abdominal pain in a female reproductive age patient often requires careful evaluation and special investigations, which sometimes may not be available for a low-income country like Thailand. A different perspective of using a clinical profile for selective management may be more appropriate.

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