Original article

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C-reactive protein as a predictor of postoperative infective complications following elective colorectal resection

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Abstract

Aim C-reactive protein (CRP) may be useful in predicting postoperative complications [1]. We investigated the sensitivity and specificity of postoperative CRP for infective complications after elective colorectal surgery.

Method One hundred and sixty consecutive patients (72 years old; interquartile range, 63–79) undergoing elective resection for colorectal cancer treated between September 2003 and October 2006 were studied. Details of the postoperative course were prospectively entered into a database. Of the 160 patients, 10 had incomplete CRP data and were excluded from further analysis.

Results Infective complications occurred in 21%, with an overall complication rate of 29%. Infective complications occurred as follows: respiratory (10), wound (9), urinary tract (2) and central line infection (1), anastomotic leakage (5), intra-abdominal abscess (3) and septicaemia of unknown origin (2). There were three postoperative deaths. The positive predictive value for infection of CRP > 145 mg/l on postoperative day 4 was 61%. The negative predictive value of CRP < 145 mg/l on postoperative day 4 for an infective complication was 96%.

Conclusion A CRP > 145 mg/l on day 4 has high specificity and sensitivity for infective complications following elective colorectal resection.

Keywords CRP, colorectal, infection, complications, postoperative

Introduction

Colorectal resection for cancer is associated with high rates of postoperative septic complications ranging from 20 to 40% [2]. Recent advances in both surgical technique and perioperative care have led to a reduction in morbidity and mortality following colorectal surgery [3,4]. Despite these advances, infective complications still pose a major clinical problem, particularly in an often high-risk patient population.

During the postoperative period, sepsis can be difficult to distinguish from the normal postoperative systemic inflammatory response related to surgical trauma. Clinical diagnosis during the early postoperative period is challenging and lacks sensitivity at a crucial stage when early diagnosis of infectious complications may significantly improve outcome [1]. While certain complications, such as anastomotic leakage, may lead to rapid onset of overwhelming sepsis, others, including urinary or respiratory tract infection or translocation of enteric bacteria, may be more insidious and difficult to localize. If it were possible to predict an infective complication early in its course, it might also be possible to avoid a negative outcome with goal-directed therapy [5,6]. Furthermore, with the recent adoption of enhanced recovery protocols after surgery, the ability to predict an uncomplicated postoperative course would also be of value when incorporated into early discharge criteria. It is for these reasons that an early sensitive and specific marker of postoperative complications would be of interest to clinicians.

C-reactive protein (CRP) is an acute phase reactant, which is found in the blood in response to inflammation under stimulation by interleukin 6 (IL-6) and tumour necrosis factor α (TNF-x). It is thought to play an important role in innate immunity as an early defence against infection, assisting complement binding to foreign and damaged cells and enhancing phagocytosis by macrophages [7]. C-reactive protein has previously been shown to predict severity in acute pancreatitis [8–10] and poor prognosis in a range of intra-abdominal malignancies [11–13], as well as predicting cardiovascular risk,

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