

Abstract. Antimicrobial Stewardship: CRP POCT to guide Antibiotic Prescribing decisions for RTIs

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Introduction

Antimicrobial resistance is a serious threat to public health, and widely associated with the excessive and inappropriate use of antibiotics. Ireland has a high rate of antibiotic prescribing in patients presenting to primary care with acute respiratory tract infections (RTIs). An estimated 2.4 million prescriptions are issued annually for RTIs in Ireland, and that number could be significantly decreased if clinicians used CRP POCT, and were provided with supports to facilitate conversations with patients about appropriate antibiotic prescribing. In February 2018, the Health Information and Quality Authority (HIQA) commenced work on a health technology assessment (HTA) in relation to C-reactive protein point-of-care testing (CRP POCT). The aim of the HTA was to establish the clinical and economic impact of providing point-of-care testing to inform antibiotic prescribing for patients presenting with symptoms of acute RTIs in primary care. The objective of CRP POCT is to assist the clinician rule out serious bacterial infection, thereby supporting a decision not to prescribe an antibiotic for those who are unlikely to benefit from treatment. This small-scale study carried out pre Covid-19 (December 2019- March 2020) was based on the HIQA HTA, using CRP semi-quantitative (CE marked) testing kits to identify the effectiveness of CRP POCT as a guide to inform antibiotic prescribing decisions for acute RTIs, in a primary care setting.

Study: Methods, Results and Analysis

107 patients presented with acute RTI symptoms over a 12-week period. **71** patients were diagnosed and treated based on history, examination and clinical decision-making skills. CRP POCT (semi-quantitative) was carried out when diagnostic uncertainty remained, regarding viral or bacterial RTIs. 36 CRP semi-quantitative testing kits (CE marked) were used. To assess the reliability and validity of the semi-quantitative tests used, 1/3 (**12**) of the subjects, consented to a CRP venous blood sample being sent to the lab for analysis and comparison with the test kit results.

A protocol, flow chart and simple audit sheet was developed to ensure the CRP POCT kits were used consistently.

C-reactive protein testing to guide antibiotic prescribing in this study, followed the manufacturers guidelines.

- **Do not routinely offer antibiotic therapy if CRP is < 40 mg/L**
- **Consider back-up antibiotic prescription if CRP 40 - 100 mg/L**
- **Offer antibiotic therapy if CRP > 100 mg/L**

Results: Based on clinician pre-test decision only. 36 Patients

- 19 (52.8%) would have received an antibiotic prescription
- 8 (22.2%) would have been given a back-up prescription
- 9 (25%) would not have received an antibiotic prescription

Results: Post CRP POCT semi- quantitative testing. 36 Patients

- 10 (27.8%) patients received an antibiotic prescription
- 7 (19.4%) received a back-up prescription. (2 of 7 (29%) of the back-up prescriptions were used)
- 19 (52.8%) received no antibiotic prescription

Outcome: 25% less antibiotics were prescribed, following semi-quantitative testing. Reliability/Accuracy of CRP POCT semi-quantitative tests in this study was high at 93%. All patients were followed up at 7 and 14 days.

Conclusion and discussion

This study demonstrates that CRP POCT is a useful tool to optimise antimicrobial prescribing in primary care. Testing was controlled to a well-defined population and in a single disease condition. The study confirms that the use of POCT for CRP can substantially reduce the rate of antibiotic prescription for acute RTIs. For long-term use a CRP POCT reader would be a more reliable, cost effective and accurate device, as semi-quantitative devices are expensive and can narrow CRP threshold choices for clinical guidance on higher CRP cut-points. RTIs are the most frequent infections encountered in primary care, accounting for an estimated 23% of general practice consultations in Ireland. International data suggest that primary care accounts for 80% to 90% of all antibiotic prescribing, with RTIs accounting for approximately 60% of prescriptions for antibiotics issued in that setting. Practical concerns include the additional consultation time required to complete CRP POCT and explain the test results to patients. Sources of error with CRP POCT cannot be eliminated, but can be moderated through regular training and the use of robust standardised operating procedures. This small-scale study concludes that correct use and careful interpretation of CRP POCT testing in patients with acute RTIs has the potential to support antibiotic prescribing decisions, increase patient understanding, reduce over prescribing rates, and promote antimicrobial stewardship.