DAWN, DMARDS AND SHARED CARE

Reducing the risk of harm to patients associated with disease-modifying anti-rheumatic drugs (DMARDs)

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Introduction

Disease-modifying anti-rheumatic drugs (DMARDs, conventional and biologic) provide the cornerstone of treatment for chronic inflammatory diseases, but these medicines are potentially toxic. Patients receiving DMARDs are at serious risk of harm if blood test results are not monitored in a safe and timely manner. NPSA Alerts highlighted safety problems with methotrexate; key recommendations include requirements for:

- formal shared care arrangements;
- monitoring in a timely and robust manner;
- continuity of care if a patient is admitted to secondary care with a co-morbidity.

Several of the recommendations could apply equally to all DMARDs.

The PINCER trial found that 24% to 30% of patients receiving methotrexate had no full blood count or liver function test in the previous 3 months. Monitoring errors are a preventable source of harm to patients; clear shared care arrangements can contribute to reducing these errors. The aim of such arrangements is to facilitate the transfer of care across the secondary/primary care interface so that safe and effective care in primary care, supported by secondary care, is ensured. Pharmacists can play an important role in developing and monitoring shared care arrangements and we were tasked with developing arrangements in north Northamptonshire for AMBER DMARDs (see box).

Informal arrangements for shared care of AMBER DMARDs existed at Kettering General Hospital; blood test schedules and monitoring of blood test results were organised in secondary care using a paper-based system, but GPs prescribed therapy. However, the secondary care monitoring service was compromised by an *ad hoc* system of monitoring blood test results and no process for timely detection of deteriorating or overdue results. The lack of a link between monitoring in secondary care and prescribing by GPs represented an unacceptable risk to patient safety.

We worked with secondary care and GPs to develop shared care protocols and subsequently to purchase a clinical management system tailored for DMARDs (DAWN RH). GPs were asked to check that blood test results were available, in range and less than one month old for all patients before issuing a new AMBER DMARD prescription. Collaboration across the primary/secondary

care divide can improve management of long-term conditions, but use of health information technology to improve effectiveness of shared care arrangements has been limited.

We aimed to determine the prevalence of missed blood test monitoring events for methotrexate in general practice after introduction of a formal shared care protocol, and then to test whether an IT-based monitoring service within secondary care was effective in reducing the percentage of patients at risk of harm due to inadequate blood test monitoring of all DMARDs.

We describe a cycle of audit and service review that led to development of a high quality, innovative service:

- to manage blood test results for patients receiving DMARDs
- to support rheumatology, gastroenterology and dermatology shared care arrangements
- to facilitate compliance with NPSA recommendations.

METHODS

Audit 1: Retrospective review of methotrexate prescribed for 209 patients in 13 general practices in 2007.

Audits 2-5: Retrospective and prospective pragmatic analysis of computerised DMARD patient records in rheumatology, gastroenterology and dermatology departments at KGH from 2009 to 2013.

PRIMARY OUTCOMES

Audit 1: 26% of patients who received a methotrexate prescription in the month preceding the audit in general practices had no blood test result in the past month.

We launched DAWNRH at KGH in April 2009.

Audit 2: Staff reviewed 100% of results within 4 days of receipt.

Audit 3: One year after launch, the percentage of patients without results in the last month or longer was: rheumatology: 13% and gastroenterology: 27%.

Audit 4: Subsequently, the percentage of patients without a result on or after the scheduled blood test date was: rheumatology: 5.0%, gastroenterology: 17.6%, and dermatology 22.4%. The percentage of patients without a result 2 months or longer after the scheduled blood test date was rheumatology: 0.1%, gastroenterology: 4.4%, and dermatology: 8.8%.

Audit 5: All patients admitted to KGH wards for more than 24 hours received a blood test.

DISCUSSION

Methotrexate monitoring in general practice

Our audit revealed that GP systems underpinning methotrexate shared care arrangements were not safe. The results were shared with commisioners who subsequently assisted with acquisition of DAWNRH.

Audits in secondary care

We showed clear benefits of using DAWNRH to manage all DMARD blood test results; these benefits became more apparent over the audit period as DAWNRH became embedded into practice. The benefits of using DAWNRH were maximised by improvements to the supporting processes identified by service review.

Nurse specialists review results within 4 days of receipt and select abnormal/deteriorating results for review. They liaise with consultants and actions are completed promptly to allow intervention before a new prescription is issued by the GP.

Only the rheumatology department has a dedicated monitoring clerk to manage overdue results. The benefit brought by a monitoring clerk was clearly seen in the lower prevalence of overdue results in rheumatology compared to gastroenterology and dermatology; work pressures limit the time nurse specialists have to manage the overdue list. However, by using DAWNRH, all three specialties reduced the percentage of patients without results 2 months or longer after their scheduled blood test to very low levels.

We suggest this is the first report to demonstrate successful use of a single computerised system to support shared care arrangements in three specialties. The need for robust DMARD monitoring systems is well established in rheumatology units, but perhaps less so in other specialties.

A number of factors were identified that affected the impact of DAWNRH. Organisational changes needed to embed DAWNRH into routine work patterns could be difficult. Anecdotally, patient characteristics and complexity of individual cases limited the impact of counselling to persuade patients to adhere to blood test schedules.

Care of patients admitted to wards

Bloods were taken for all methotrexate patients identified during the audit period, allowing full assessment of haematological, renal and hepatic function to discount methotrexate toxicity and to detect or prevent acute kidney injury.

Strengths and limitations of audits

Audits in secondary care were pragmatic studies and reflect real-life clinical practice. However, the audits did include all patients receiving DMARDs in three specialties (over 2,400) and were conducted over an extended period of time beyond implementation of DAWNRH.

We have equated prompt review of blood test results and reduction of overdue results with reduction of risk of harm to patients due to missed monitoring events; correlation with reduction in actual harm caused was outside the scope of these audits.

CONCLUSION

Implementation of DAWNRH to support a secondary care DMARD monitoring service resulted in timely review of blood test results and identification of overdue results, and reduced prevalence of overdue results. Continuity of care for patients admitted to wards was also ensured.

DAWNRH supports shared care arrangements for AMBER DMARDs across three different specialties. The benefits of secondary care expertise have been safely combined with the continuity of care provided by the patient's own GP.

DAWNRH underpins the monitoring service, but healthcare staff and managers need to be realistic about the organisational changes needed to embed new IT into existing work patterns.

RED	These are medicines that should be initiated by specialists only and prescribing retained within secondary care. Therefore, GP initiation or continuation of treatment of RED medicines is not recommended. Examples include the biologic DMARDs (cytokine modulators) such as adalimumab.
AMBER	Broadly, a specialist medicine may be classified as AMBER if it is not normally prescribed by GPs, but the GP would normally be clinically competent to undertake associated specialised care if provided with appropriate guidelines, while the specialist initiating treatment retains responsibility for monitoring progression of the condition being treated. Examples include conventional DMARDs such as methotrexate.

Abbreviated definition of terms used in the Northamptonshire Prescribing Advisory Group traffic light classification (for full definition see online article)