

## SHORT REPORT

# Antibiotic prescription for patients referred to a specialist breast clinic

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Hospital referral is indicated as an emergency for breast infections not settling with oral antibiotics. Referrals to a breast clinic over a period of 6 months were assessed for prior antibiotic prescription. A total of 1078 patients were seen during this period. 91 (8%) patients had been prescribed antibiotics, 71% of which had been prescribed for non-infective conditions. Of those patients treated for infection, 42% had the wrong antibiotic prescribed. The final diagnoses for patients inappropriately prescribed antibiotics were chest wall pain in 23% and duct ectasia in 14%. Although the reasons for prescription of antibiotics are multifactorial, careful examination of the patient will diagnose chest wall pain. Delayed prescribing may be appropriate for some patients.

**B**reast infection is decreasing in prevalence, and is usually treated in the community.<sup>1</sup> Hospital referral is indicated as an emergency if symptoms do not settle rapidly with oral antibiotics.<sup>1</sup> Patients who are admitted receive a combination of intravenous antibiotics, and aspiration or incision and drainage if an abscess has developed. Recurrent episodes of periductal mastitis or puerperal mastitis may be seen in the outpatient department.

Inappropriate use of antibiotics is a global public health concern because of its association with antibiotic resistance.<sup>2</sup> Increasing resistance of specific bacterial strains poses a severe health threat; of particular concern is multidrug-resistant *Streptococcus pneumoniae*<sup>3</sup> and methicillin-resistant *Staphylococcus aureus*.<sup>4</sup> The inappropriate use of antibiotics is also detrimental in terms of side effects and negative psychological effect when symptoms fail to resolve, or when the general practitioner's diagnosis is contradicted after consultation at a breast clinic.<sup>5</sup>

Apparently, antibiotics had been prescribed to a considerable number of patients before referral to the breast clinic, for whom non-infective diagnoses were made in clinic. Consequently, we investigated the prescription of antibiotics for the breast symptoms that led to the patient's referral to the breast clinic at the Royal Gwent Hospital, Newport, UK.

## PATIENTS AND METHODS

Patients are referred to the breast clinic at the Royal Gwent Hospital for evaluation by specialist breast surgeons. Referrals are made by local general practitioners and from other specialties within the hospital. Patients are generally seen within 2 weeks of referral.

Patients attending the breast clinic complete a questionnaire to allow data entry into the British Association of Surgical Oncology Breast Database. The question "Has your general practitioner prescribed you antibiotics for these breast symptoms?" was included for patients attending during the 6-month period between August 2005 and

February 2006. If "Yes" was chosen, patients were directly questioned about symptoms that might suggest breast infection such as erythema, pain and temperature. The referral letter was used in conjunction with patient questioning in clinic to assess the history. Some patients were still taking antibiotics when seen in clinic. If the name of the antibiotic could not be obtained from the patient, the prescribing general practitioner's clinic was contacted. Diagnoses were made after the appropriate "triple" assessment. This includes history, clinical examination and relevant radiological (mammogram, ultrasound scan) and pathological (fine needle aspiration, core biopsy) investigations, where appropriate.

Whenever the diagnosis made in the breast clinic after full assessment was one of bacterial infection, such as purpurulent mastitis, periductal mastitis or breast abscess, it was considered appropriate to prescribe antibiotics. This provided either a current (if no change in symptoms was seen) or a retrospective diagnosis. Antibiotics considered appropriate are flucloxacillin or erythromycin (if penicillin sensitive) for lactational and skin-associated infection, and coamoxiclav, or flucloxacillin or cephalexin or erythromycin with metronidazole for non-lactational infection.<sup>1</sup>

Statistical analyses (positive predictive values and confidence intervals) were carried out using the Statistical Package for the Social Sciences V.14.0. Comparisons between groups were made using the  $\chi^2$  test in SPSS.

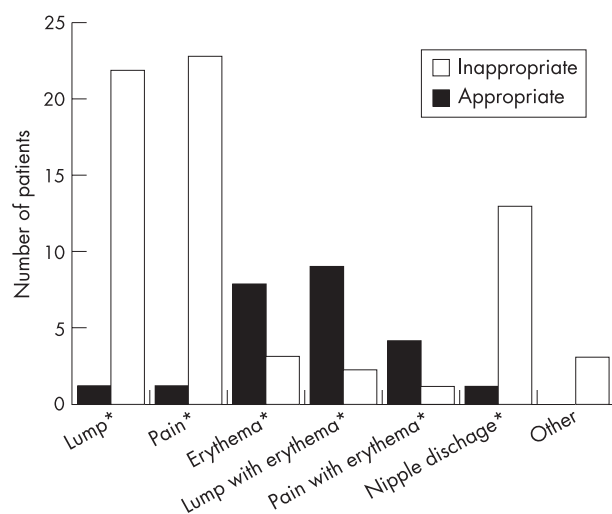
## RESULTS

A total of 1078 patients were seen during the 6-month period. In all, 91 (8%) patients had been prescribed antibiotics by their general practitioners, of whom 87 patients were women and 4 were men. A total of 65 (71%) of these prescriptions were considered to be inappropriate ( $p < 0.001$ ). Of the 26 (29%) patients appropriately prescribed with antibiotics, 11 (42%) had the wrong antibiotic prescribed ( $p = 0.001$ ). The antibiotic prescribed wrongly most often was flucloxacillin alone for non-lactational infection (35 (54%) patients).

Figure 1 shows the prescription of antibiotics by presenting symptom. The presence of erythema increases the odds of infection dramatically. Figure 2 shows the final diagnoses in the patients studied. The commonest diagnoses in the patients inappropriately prescribed antibiotics were chest wall pain, duct ectasia and mastalgia. Eight tertiary referrals from other surgical firms within the hospital were seen with infective diagnoses during this period. All were appropriately prescribed antibiotics; however, the wrong antibiotic had been prescribed in each case.

## DISCUSSION

This study has shown that antibiotics are commonly prescribed inappropriately for patients before referral to specialist breast services. Most breast infections are treated in primary care and are not referred for specialist assessment. Referral letters for the patients referred often indicate an uncertainty in the diagnosis, and therefore may reflect a



**Figure 1** Antibiotic prescription for breast symptoms. Appropriateness based on final diagnosis.

\*difference between appropriate and inappropriate prescriptions ( $p < 0.05$ )

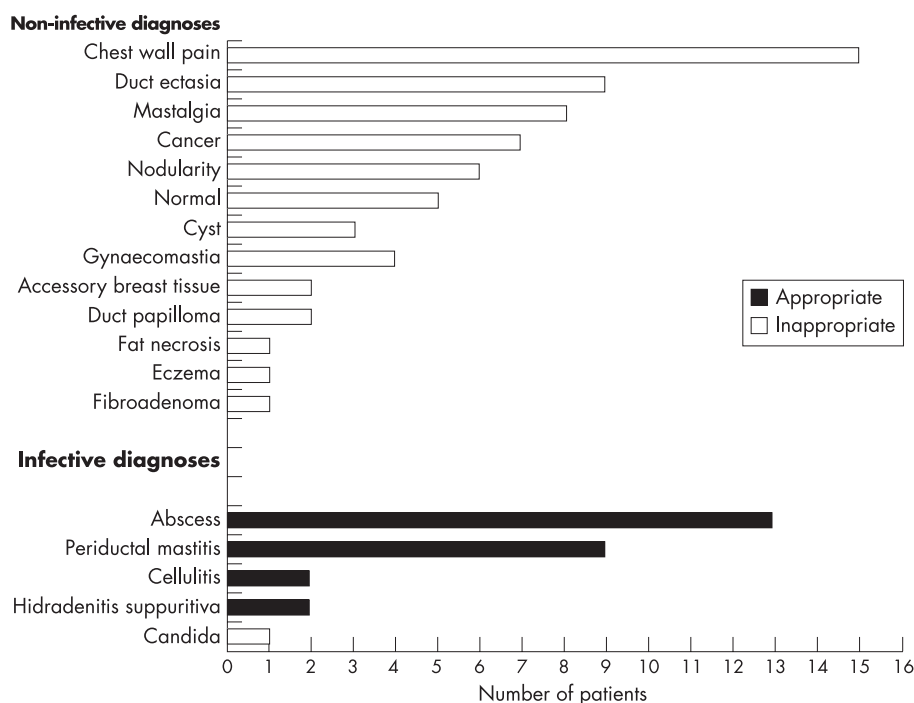
diagnostic “grey area”. However, although appropriate for specialist referral, most of the non-infective diagnoses are clinically distinguishable from infective diagnoses. Any breast symptom in the absence of erythema is unlikely to be infective (fig 1) and the presence of erythema is the strongest predictive sign for infection in this group (positive predictive value 0.23, 95% CI 0.14 to 0.32).

The most common non-infective diagnosis was chest wall pain (fig 2). Patients presenting with breast pain alone should be examined carefully to distinguish chest wall pain from true breast pain, as chest wall pain does not require specialist breast assessment.<sup>1</sup> To examine for chest wall pain, the patient should be assessed both supine and in the lateral

position. Chest wall pain is diagnosed by eliciting tenderness when palpating the ribs just lateral to the breast; sometimes the examining hand will need to be directed beneath the breast disc to facilitate this. Bimanual palpation of the breast itself will not be as painful as direct chest wall palpation when chest wall pain is present. The second most common diagnosis for inappropriate prescription was duct ectasia. Although duct ectasia produces a discharge, which may be mistaken for pus, erythema is absent.

The breast clinic assessment was made at different intervals from onset of symptoms and prescription of antibiotics. This meant that some patients could be diagnosed with persistent infection in clinic, whereas some diagnoses were retrospective. In the case of retrospective diagnoses, we were relying on the referral letter and the history taken in clinic. This may bias the results towards non-infective diagnoses. However, the cardinal signs of infection are easily described by the patient or in the referral letter, suggesting that any bias is small.

The reasons for antibiotic prescription are multifactorial, and are greatly influenced by the doctor–patient relationship and perceived patient expectation.<sup>6</sup> Breast disease is particularly emotive in the current media climate,<sup>7</sup> and it may be difficult to reassure patients. Possible strategies for reducing the inappropriate use of antibiotics for breast symptoms include consulting styles that clarify patient fears and expectations,<sup>6</sup> or the reassurance that the diagnosis will be confirmed by specialist referral. Delayed prescribing may be appropriate in some patients,<sup>8</sup> especially if there is clinical concern that symptoms could constitute an early infection in the absence of erythema. The use of delayed prescribing to rationalise antibiotic use for sore throats in children has been assessed,<sup>9</sup> and is attributed to reducing prescriptions by half in the last decade.<sup>10</sup> Asking the patient to return to the doctor for the prescription was the most effective strategy in patients with sore throats.<sup>9</sup> In the context of breast disease, this would allow reassessment of symptoms with the potential of emergency surgical referral if frank infection or abscess formation has developed.



**Figure 2** Final diagnosis for patients prescribed antibiotics.

### Learning points

1. Breast symptoms in the absence of erythema are unlikely to be infective.
2. Flucloxacillin should be prescribed for lactational and skin-associated infection, and coamoxiclav for non-lactational infection.
3. To distinguish between true mastalgia and chest wall pain, the patient should be assessed in both the supine and lateral positions.

### CONCLUSIONS

Antibiotics are often prescribed inappropriately for patients referred to specialist breast clinics with non-infective diseases, and where appropriately prescribed the choice of antibiotic used to treat true breast infection in both primary and secondary care is often wrong. Patients presenting with breast symptoms in the absence of erythema are unlikely to have breast infection.

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