A cyberclinic in rheumatology

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ABSTRACT - **Objective:** To evaluate the feasibility of a rheumatology consultation and advisory service using internet and e-mail.

**Methods:** We placed a detailed rheumatology proforma on our website for general practitioners to complete and e-mail to our outpatients clinic. To study its feasibility, two junior doctors interviewed and completed the proforma for 207 new patients. Based on this information, the consultant provided provisional diagnoses, work up & management plans, which were then compared with those drawn up following face-to-face assessment of the same patients in the outpatients clinic.

**Results:** In most instances the pre- and post-examination diagnoses, work up & management plans were similar. Diagnostic concurrence was noted in 178 (86%) patients; no changes were required in x-rays and other tests requested in 129 (62%) patients; and the suggested treatment (including corticosteroid injections) remained the same in 153 (74%) patients.

**Conclusion:** Our results suggest that it is feasible to offer an e-mail or internet based outpatients consultation and advisory service in rheumatology and possibly other disciplines.

Many hospital-based rheumatology clinics are overcrowded and have long waiting lists. Telemedicine is likely to play an increasingly important role in future health care delivery\(^1\),\(^2\), and this study explores the use of the internet and e-mail to provide more efficient and effective consultation and delivery service in rheumatology.

**Methods**

We placed a detailed rheumatology proforma containing some 70 items on our website (www.with.man.ac.uk/rheumat/quest.htm) for general practitioners to complete and return to our outpatients clinic by e-mail. To test its feasibility, two junior doctors (HL and CE) with little or no previous rheumatological experience interviewed 207 new patients (76 men, 131 women; mean age 53 years) and completed forms for each. Based solely on this information (ie without seeing the patients), the consultant (BP) provided provisional diagnoses, work up and management plans. These were then compared with actual face-to-face assessment of the patients by the consultant.

**Results**

After seeing the patients in the clinic, the consultant agreed diagnostic concurrence (with additional minor or secondary diagnoses or exclusions) in 178 (86%) patients, proposed no

**Table 1. Diagnostic groups and changes in diagnostic work up and management advice before and after patients were examined in the outpatients clinic.**

| Diagnosis suggested by e-mailed proforma (requiring exclusions)* | n |
|---------------------------------------------------------------|---|
| Osteoarthrosis of various joints                              | 71|
| Spondylotic/mechanical back pain                              | 28|
| Spondylotic/mechanical neck pain                              | 6 |
| Soft tissue rheumatism including CTS and TB                  | 75|
| Fibromyalgia                                                  | 29|
| Inflammatory arthritis/rheumatoid arthritis                  | 33|
| Sero-negative arthritis, including psoriatic/spoinglyarthropathy | 12|
| Crystal arthritis                                             | 6 |
| Non-specific arthralgia                                       | 10|
| Connective tissue disorders/Sjogren's syndrome                | 19|
| Polymyalgia/temporal arteritis                                | 5 |
| Miscellaneous**                                               | 11|

**Changes to diagnosis after assessment in outpatients clinic**

| Change | n  |
|--------|----|
| No change | 109 (53%) |
| Same, but additional minor diagnoses or exclusions | 69 (33%) |
| Different main diagnosis | 29 (14%) |

**Changes to x-ray requests after assessment in outpatients clinic**

| Change | n  |
|--------|----|
| No change | 174 (84%) |
| Changes required | 33 (16%) |

**Changes to other investigations after assessment in outpatients clinic**

| Change | n  |
|--------|----|
| No change | 153 (74%) |
| Changes required | 54 (26%) |

**Changes in management advice after assessment in outpatients clinic:**

a) Corticosteroid and lignocaine injections

| Change | n  |
|--------|----|
| No change | 189 (92%) |
| Changes required | 18 (8%) |

b) Other treatments

| Change | n  |
|--------|----|
| No change | 163 (79%) |
| Changes required | 44 (21%) |

\(^*\) More than one diagnosis may be applicable to one patient.

\(^{**}\) Including amyloid-related arthritis, algodystrophy, palindromic rheumatism, neoplastic/para-neoplastic condition, hypothyroidism.

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Key Points

A detailed rheumatology proforma, accessible to general practitioners on the internet, can elicit a patient's history fully and be e-mailed to a hospital specialist for assessment

This cyberclinic allows the specialist to respond quickly with a likely diagnosis, work up and management plans, on an interim basis or as final advice, depending on patient outcome

Such cyberclinics have great potential in hard-pressed outpatients services in rheumatology and other disciplines in the NHS

change in the x-rays or other tests requested in 129 (62%) patients, and accepted the suggested treatments, including corticosteroid injections, in 153 (74%) patients. Further details are given in Table 1.

Discussion

These findings indicate that it might be possible to offer an internet or e-mail based outpatients consultation and advisory service. In rheumatology (and in other disciplines) nothing is as informative as a comprehensive history and physical examination. Only a small proportion of the diagnostic clues is derived from investigations. We have exploited this fact by using a detailed rheumatology proforma, which requires no experience in rheumatology on the part of the referring doctor, to obtain relevant history and to identify important abnormalities (which may otherwise be overlooked) that are helpful in diagnosis.

In the UK, outpatient waiting times are notoriously long and non-attendance rates are high at around 15%, whilst in many other countries there are few or no specialists in rheumatology (or other disciplines). Ironically, information technology is often more readily available, and so the service we propose may solve both these problems with minimal expense.

The rheumatology cyberclinic may be an interim service for those awaiting an outpatients consultation. Patients who progress well on the initial advice may not need to attend specialist centres at all, whilst the sizeable proportion who do can be sent earlier appointments than would otherwise be possible. Our previous experience of outpatient telephone follow-up suggests that patients and general practitioners are likely to be receptive to this innovative service.

Referring doctors should find our proforma on the website simple and user-friendly. Those who are unfamiliar or unhappy with completing forms on-screen may print out and use a paper version (this information can then be entered by secretarial staff and e-mailed – or simply faxed – to the outpatients clinic). Practitioners' anxieties that the investigative burden will be thrust upon them can be allayed by registering patients in the routine manner as outpatients and arranging tests at the hospital.

Simultaneous digital transmission of photographic images of patients (eg of hands, affected joints, skin lesions) when e-mailing the proforma may improve diagnostic accuracy; this is a promising development which we will explore. The advantages of our proposed system over other teleconsulting initiatives, eg use of video cameras, include:

- little or no chance of technical failure
- no requirement for simultaneous presence of a specialist 'at the other end' (when patient is consulting the referring doctor), resulting in lower costs and fewer time delays.

It may soon be possible to use computer based information systems to provide diagnostic forays and management advice that will enable specialists to offer services to a wider range of patients. Cyberclinics of this type may well become an important service provision in the millennium.

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