

Telerheumatology — diagnostic accuracy and acceptability to patient, specialist, and general practitioner

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SUMMARY

This study examines the diagnostic accuracy and acceptability of telemedicine in the field of rheumatology. One hundred patients had a telephone and televisual consultation and the results were compared with a face-to-face consultation. While the telephone consultations were often unsatisfactory, the televisual consultations were highly accurate (97%) and acceptable to patients, general practitioners, and specialists.

Keywords: telemedicine; rheumatology; consultation; acceptability of health care.

Introduction

WITH increasing emphasis on the use of information technology in primary care, many opportunities now exist for using telemedicine as a cost-effective means of speeding the delivery of specialist services to patients.¹⁻³ This study shows how the general practitioner's (GP's) surgery can be used as a location for the televisual interaction between specialists and patients, with the GP acting as a consultation facilitator.

Method

This was a non-randomised prospective study of 100 new consultant referrals representing a typical rheumatology case mix. Patients were selected by one of the authors (LG) using information from the original referral form. The main outcome measures were diagnostic accuracy, patient satisfaction, and doctor satisfaction.

Consultations took place in an urban health centre. A history was taken by one of three GPs, none of whom had received specialist training in rheumatology. Next there was a three-way telephone consultation between the patient and the GP in one room and the specialist in a nearby hospital. Finally, a teleconference between the patient and the specialist took place using a desktop video conferencing unit (VC7000, BT/ISDN line, 128 kbits/s). A conventional video camera (JVC, KY-F55B with HZ 610 MDU 10X) zoom lens was available for close-up pictures. Ten minutes was allocated for each of these three stages and every effort was made to keep within this time limit.

The specialist then saw the patient for a 'gold standard' face-to-face consultation; this took place in a health centre as it was more convenient for the patients. After each consultation the patient, the GP, and the specialist completed questionnaires to assess the diagnostic accuracy and acceptability of the consultations.

Statistical methods

Satisfaction scores, with a small number of ordered categories, were examined using the χ^2 test for trend. When there were five ordered categories the data were stored and means computed. Inferences about these were made with recourse to standard parametric tests, e.g. matched and independent sample *t*-tests. Diagnostic accuracy was described, both in terms of the proportion of agreement and with that agreement adjusted for random chance using a κ statistic.

Results

Of the 100 patients, 75 were female and 25 were male, with

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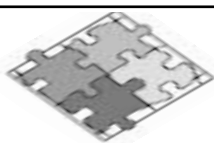
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HOW THIS FITS IN*What do we know?*

Many opportunities now exist for using telemedicine as a cost-effective way of bringing specialist services to patients. The GP's surgery can be used as a location for televisual consultations between specialists and patients, with the GP acting as a consultation facilitator.

*What does this paper add?*

Despite the study's limitations, the diagnosis of rheumatological conditions via the medium of television using a GP facilitator has been shown to be both highly accurate and acceptable to doctors and patients. A randomised controlled trial exploring the clinical and cost-effectiveness of GP-facilitated telerheumatology is now needed.

a mean age of 48 years (range = 20–87). Final diagnoses were: fibromyalgia (30%), degenerative arthritis (26%), soft tissue disease (27%), rheumatoid arthritis (5%), connective tissue disease (3%), psoriatic arthritis (3%), reactive arthritis (4%), and peripheral neuropathy (2%). Fibromyalgia was differentiated from soft tissue disease because fibromyalgia is not considered a true disease entity but is a psychosomatic disorder or symptom complex. (While this is a matter of some controversy, soft tissue rheumatism is generally regarded as a separate entity by British rheumatologists.) Specialist diagnostic accuracy was 71% ($\kappa = 0.62$) after the telephone consultation and 97% ($\kappa = 0.96$) after the televisual consultation. The specialist felt that he needed to see 75% of patients face to face after the telephone consultation but only 6% of patients after the televisual consultation, the reasons being 'need to verify GP examination' (four cases) and 'inadequate counselling' (two cases).

The GP felt that 51% of patients needed to see the specialist after the telephone consultation but only one needed to see the specialist after the televisual consultation. GPs expressed a high level of satisfaction after the televisual consultation (Table 1) and there was a high level of correlation between the degree of GP and specialist satisfaction following the televisual consultation (Fisher's exact test, $P = 0.034$).

Patients were asked whether they were satisfied that they had been given a diagnosis after each consultation. The satisfaction scores were 56% after the telephone consultation, rising to 90% and 97% after the televisual and face-to-face consultations respectively (Table 2). There were no statistical differences across different diagnostic groups.

Although 90% of patients expressed satisfaction that they had received a diagnosis after the televisual consultation, 42% of patients still felt that they needed to see the specialist face to face; in this group of patients there was no trend in age, sex or final diagnosis.

Technical problems were encountered with the video conferencing unit on three occasions owing to faulty connections and an ageing unit.

Discussion

Our results show that the diagnostic accuracy of the televi-

Table 1. The number of patients from each diagnostic group that the GP felt needed to be seen face to face after the teleconsultations.

Diagnosis (face to face)	Telephone consultation	Televisual consultation
Fibromyalgia	12/30 (40%)	0
Degenerative arthritis	12/26 (46%)	0
Soft tissue rheumatism	21/27 (78%)	1/27 (4%)
Miscellaneous	6/17 (40%)	0
Total	51/100 (51%)	1/100 (1%)

Table 2. Patient and GP satisfaction after each consultation.

Satisfaction	After telephone consultation (%)	After televisual consultation (%)	Face to face consultation (%)
Patient	56	90	97
GP	51	99	N/A

sual consultation is extremely high (97%) and while we are not aware of any comparative data for rheumatological tele-diagnosis, this figure compares favourably with those of a recent telerheumatology study where a diagnostic accuracy of 50%⁴ was reported. While there may well be fewer diagnostic categories in rheumatology than dermatology, and therefore perhaps a higher diagnostic accuracy may be expected, we feel that the 'real time' factor of the telerheumatological consultation enabled the specialist, aided by the GP, to pick up subtle indicators that may be lost in 'store and forward' methods of telemedicine. The real time component also allowed the GP to remain active as a facilitator during the consultation.

The high level of diagnostic satisfaction among GPs and specialists probably reflects the confidence that they had in the televisual consultation. The study consultations lasted about half an hour in total and this is comparable to the time allotted to new patients at rheumatology outpatient departments.

While the level of patient satisfaction is lower than that of the doctors, 58% of patients felt that they did not need to see the specialist face to face after the televisual consultation. This figure is encouraging, and would appear to suggest that televisual rheumatology consultations may be an acceptable alternative to an outpatient consultation for some patients.

The main weaknesses of the study are that patients were selected rather than randomised and that the same specialist saw a given patient for every type of consultation. It would have been desirable to have a randomised blind study in which a different specialist saw the patients for each different consultation type; however, for practical reasons, this was not possible.

Despite these limitations, we feel we have shown that the diagnosis of rheumatological conditions via the medium of television using a GP facilitator is both highly accurate and acceptable to doctors and patients.

A randomised controlled trial exploring the clinical and cost-effectiveness of GP-facilitated telerheumatology is now needed.

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