Do general practices which provide an acupuncture service have low referral rates and prescription costs? A pilot survey

Gina Johnson, Adrian White, Ruth Livingstone

Abstract

Background Studies by individual acupuncture practitioners have given an indication that offering acupuncture in primary care may reduce the need for referral to secondary care and reduce the costs of prescriptions. It would be informative to find out whether these findings can be supported by data from other practices. The aim of this study was to test the feasibility of surveying national data on referrals and prescribing.

Methods Three primary care trusts (PCTs) were selected, and all practices within each trust were sent an email asking whether any member of the primary care team offered acupuncture, and if so how many appointments per week. Data on rates of referral to orthopaedic, physiotherapy, pain and rheumatology clinics were then sought from the PCT, both for the practices offering acupuncture and for the PCT as a whole. Similarly, data on costs of prescriptions for non-steroidal (NSAID) and non-opioid analgesic drugs were obtained from the Prescription Pricing Authority.

Results Out of the 109 practices surveyed, a total of 14 (13%) offered acupuncture services to some extent. There was wide variation in provision between the different PCTs. The eight practices which offered at least one appointment per week for every 2000 registered patients were included in the analysis. The mean values (and SDs) for the three PCTs and for the eight acupuncture practices, respectively, were as follows: for referral to various clinics: orthopaedic 32.3 (16.2) and 27.4 (10.87); pain clinic 1.6 (1.3) and 2.8 (1.6); physiotherapy 13.4 (14.5) and 29.5 (10.0); and rheumatology 4.7 (2.3) and 6.4 (3.0). The mean values for costs of non-opioid analgesics were £1820 (£442) and £2008 (£762); and for NSAIDs were £4148 (£269) and £4476 (£1366), respectively. There were no trends towards a reduction of clinic referral or prescription costs.

Conclusions We have conducted the first survey of the effects of provision of acupuncture in UK general practice, using data provided by the NHS, and uncovered a wide variation in the availability of the service in different areas. We have been unable to demonstrate any consistent differences in the prescribing or referral rates that could be due to the use of acupuncture in these practices. The wide variation in the data means that if such a trend exists, a very large survey would be needed to identify it. However, we discovered inaccuracies and variations in presentation of data by the PCTs which have made the numerical input, and hence our results, unreliable. Thus the practicalities of access to data and the problems with data accuracy would preclude a nationwide survey.

Keywords

Acupuncture, survey, cost identification study, general practice.
was provided by a member of the primary health care team in about 20% of practices and by an independent practitioner in about 5%. 

In considering whether any new therapy should be adopted in place of an existing one, evidence is needed that it provides either the same benefits for the patient at a reduced cost, or worthwhile additional benefits at an acceptable additional cost. This evidence can be provided formally only through a full economic evaluation within a randomised, controlled trial that compares the various treatments directly – this would be, for example, a cost effectiveness or cost benefit analysis. However, these trials are expensive and may not represent normal, everyday practice.

Simpler and cheaper methods will inevitably be less rigorous but can provide some indication of whether the treatment may be worthwhile. For example, in the USA, several studies have analysed the health insurance costs of patients with acute back pain who visit chiropractors and compared them with costs of those who visit their GP or an orthopaedic surgeon. The obvious weakness of this type of study is the likelihood that patients seeing the various practitioners had different severity of back pain.

In acupuncture research, several uncontrolled studies have identified the cost consequences of providing acupuncture in primary care and these have uniformly suggested that acupuncture may reduce the costs of other health care. Two early studies showed a reduction in costs of prescriptions after introducing acupuncture, particularly prescriptions for analgesics. Another study showed similar reductions in prescription costs from tender point injection. A prospective trial estimated the cost savings from using acupuncture instead of referring patients to secondary care using hypothetical matched controls, and a fourth showed a reduction in the number of patients referred to physiotherapy after acupuncture was introduced into a practice.

These studies have various limitations, principally in making the assumption that there is little difference in the outcomes of the different treatments; also, they do not take account of the costs of treating any adverse events of the different approaches.

Nevertheless, it may be interesting and informative to see whether these reductions in prescriptions and referrals achieved by individual acupuncturists can be strengthened by the data from a large number of practices. We therefore planned to compare the referral patterns and prescription costs of GP practices that offer acupuncture with those that do not; we also planned to compare practices that offer a large number of appointments for acupuncture with those that provide few, as a kind of ‘dose response’ analysis. This survey was retrospective.

We anticipated that this type of study would encounter several difficulties that would limit the conclusions, mainly:

a) access to accurate and reliable data on prescriptions and referrals
b) ‘noise’ (variance) in the data, because of the known high variation between practices and between individual GPs in their patterns of prescription and referral
c) the low cost of analgesic drugs and the small numbers of referrals per practice, which may necessitate large sample sizes to demonstrate significant differences.

We considered that a national survey may overcome the limitations (b) and (c) to a certain extent, but at the possible cost of increasing the difficulties of accessing the data.

We also accept that any correlation between provision of acupuncture and reduced costs could not be assumed to be causal since other factors might influence both the use of acupuncture and other medical costs. For example, a practice population with high prevalence of heavy manual labourers with back pain might generate a high demand for acupuncture and high rate of referral to orthopaedic out-patients.

We therefore decided to conduct an initial pilot survey to test the feasibility of the method and to determine the characteristics of the data, to inform a future large scale study.

**Methods**

Three Primary Care Trusts (PCTs) in England (Lincolnshire South West Teaching PCT, Luton Teaching PCT, and Plymouth Teaching PCT) were selected for convenience. These PCTs differ considerably in their population characteristics in terms of urban/rural and ethnic mix. We asked each PCT for a list of the email addresses of all their practice managers. We then sent an email to each practice manager, asking whether any member of their primary care team provided NHS acupuncture.
If the answer was yes, we then asked them for their practice list size and the number of acupuncture appointments offered per week as on 1st April 2005. Non-responders were followed up with one email and one telephone call.

The year to 1st April 2005 was chosen for the study since the organisation of Primary Care Trusts was due to be revised significantly on 1st April 2006 with some PCTs being abolished completely, so that information for the year to April 2006 was likely to become inaccessible.

The data that we intended to collect for the PCT overall and separately for each practice in which acupuncture was performed, were as follows:

a) the number of NHS orthopaedic, pain clinic, physiotherapy and rheumatology referrals made between April 2004 and March 2005.

b) the prescribing costs for the same period for drugs used to treat musculoskeletal pain (BNF 10.1.1 non-steroidal anti-inflammatory drugs and 4.7.1 non-opioid analgesics) from records held by Prescription Analysis and Cost Tabulation (PACT).

During the progress of this pilot project, the methods evolved in the light of advice and responses from staff of the PCTs. We initially planned to ask the practice managers who indicated that their practice provided acupuncture, to provide referral and prescribing information, but we were advised by a PCT Director that we should make an application for the information we needed under the Freedom of Information Act (FoI Act, 2000). This Act requires public authorities, including PCTs, to provide any information required within 20 days unless it is specifically exempt for some specified reason.

Interpretations of the Freedom of Information Act varied widely between the different PCTs. One PCT refused to allow the research team access to a list of practice managers’ email addresses because this was ‘not in the public domain’, although the addresses and phone numbers were on the PCT website. All messages in this PCT had to be sent through an intermediary, which introduced delays and made it difficult to identify which practice had responded.

There was considerable confusion about the ownership of PACT data, but eventually after discussions with the Information Governance Manager of the Prescription Pricing Authority (PPA) it was decided that, although these data were held by the PCTs, permission to access them had to be obtained from the Prescription Pricing Division of the NHS Business Services Authority. However, the PPA would not release data from single handed practices without the signed consent of the doctor concerned. Once these issues had been resolved, there was no problem in obtaining the necessary information.

The Informatics officers of the three PCTs were asked to provide PCT-wide and practice-level data on referrals to orthopaedic, rheumatology, physiotherapy and pain clinics in 2004/5. Discussion about data access was protracted in one PCT, involving meetings with the R&D department, Governance Development Officer, Freedom of Information Officer, Data Protection Officer, Prescribing Information Analyst and Deputy Director. This delayed the implementation of the survey for several months.

We obtained advice from the chairman of Luton and South Bedfordshire Local Ethical Committee (LEC), who stated that this survey did not require ethical approval. This opinion was confirmed by the Chairman of the Plymouth and South West Devon LEC.

Analysis

The analysis was exploratory, and most decisions were made after inspecting the data. We decided that the six GP practices which offered less than one appointment per 2000 patients per week did not provide sufficient acupuncture to influence referral or prescribing rates, and so these were excluded from the ‘acupuncture’ group. These were generally the larger practices, where there was likely to be only one partner offering acupuncture in a group practice. The remaining eight acupuncture practices were subdivided into high and low providers, based on the number of registered patients for each acupuncture appointment per week: the cut-off point was pre-determined as the median, 1:1133. The entire PCT average was used for comparison, rather than just those practices that do not offer acupuncture. This was decided because the relatively small amount of acupuncture provided would not make a significant impact on the overall figures. The orthopaedic, pain clinic, physiotherapy and rheumatology clinic referral rates and annual musculoskeletal drug costs per 1000 patients were calculated for the PCT as a whole and for these eight practices.
Results

The project was conducted in 2006 in three separate PCTs, covering 109 practices working from 123 sites and with 616,415 registered patients. We had a 57% response to our first email (subject: ‘General Practice – some alternatives’) (62/109 practices), rising to

Table 1 Mean referral rates and prescription costs

<table>
<thead>
<tr>
<th>PCT</th>
<th>Orthopaedic</th>
<th>Annual clinic referrals per 1000</th>
<th>Physiotherapy</th>
<th>Rheumatology</th>
<th>Non-opioid NSAIDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>14.6</td>
<td>23.7</td>
<td>3.1</td>
<td>2271</td>
<td>4382</td>
</tr>
<tr>
<td>B</td>
<td>35.8</td>
<td>2.6</td>
<td>6.3</td>
<td>1800</td>
<td>4293</td>
</tr>
<tr>
<td>C</td>
<td>46.4</td>
<td>3.1</td>
<td>31.0</td>
<td>1360</td>
<td>4229</td>
</tr>
</tbody>
</table>

Mean referral rates and prescription costs for three PCTs and for those practices within each PCT that provided at least one acupuncture appointment weekly per 2000 registered patients. Values are means (SD).

Table 2 Data on referral rates

<table>
<thead>
<tr>
<th>PCT</th>
<th>Number of patients</th>
<th>Acupuncture appointments, /week /1000 patients</th>
<th>Annual clinic referrals per 1000 registered patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>262 236</td>
<td>14.6</td>
<td>23.7</td>
</tr>
<tr>
<td>B</td>
<td>192 591</td>
<td>35.8</td>
<td>2.6</td>
</tr>
<tr>
<td>C</td>
<td>201 588</td>
<td>46.4</td>
<td>3.1†</td>
</tr>
<tr>
<td>SD</td>
<td>218 805</td>
<td>32.3</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Mean for 1 acupuncture practice in C

Mean for 1 acupuncture practice in C

Data on referral rates in three PCTs and eight individual practices that offered acupuncture. Practices are arranged in increasing order of the number of acupuncture appointments per week.

* These figures are incomplete and unreliable
73% (80) when it was re-sent with a different heading (subject: ‘Funding for acupuncture in general practice’). The remaining practices were then contacted by telephone.

A total of 14 practices (13%) provided acupuncture services to some degree. There was considerable variation in acupuncture provision between the different PCTs: 7/47 practices in one, 1/36 in a second and 6/26 in the third. The acupuncturists of two of these practices were members of the research team. Four of the remaining acupuncturists responded by email and one by letter; the rest (seven) were contacted by telephone. Two of these practices were single handed.

The mean values (and SDs) for the three PCTs and for the eight acupuncture practices respectively were as follows for referrals: orthopaedic clinic 32.3 (16.2) and 27.4 (10.87); pain clinic 1.6 (1.3) and 2.8 (1.6); physiotherapy 13.4 (14.5) and 29.5 (10.0); and rheumatology clinic 4.7 (2.3) and 6.4 (3.0). The mean values for annual costs of non-opioid analgesics were £1820 (£442) and £2008 (£762), for PCTs and acupuncture practices respectively; and for NSAIDs, £4148 (£269) and £4476 (£1366). There is thus no evidence from these data that provision of acupuncture is generally associated with lower referral rates or lower prescription costs.

The data show remarkable variation between different PCTs, probably due to local differences in referral patterns and in methods of collecting and classifying the data. The differences may also be due to differences in sociodemographic characteristics of the different practice populations, which was beyond the scope of this survey to collect. Therefore, the mean values for referrals and prescriptions for each PCT and the means for the acupuncture practices within each PCT are presented in Table 1. To preserve anonymity, the names of PCTs and individual practices have been replaced by codes. Again, there is no evidence of any systematic effect of acupuncture on referral or prescribing rates.

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Table 1

<table>
<thead>
<tr>
<th>PCT</th>
<th>Acupuncture appointments /week/1000 patients</th>
<th>Annual prescriptions (£/1000 patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2271</td>
<td>4382</td>
</tr>
<tr>
<td>B</td>
<td>1800</td>
<td>4293</td>
</tr>
<tr>
<td>C</td>
<td>1388</td>
<td>3878</td>
</tr>
<tr>
<td>mean</td>
<td>1820</td>
<td>4184</td>
</tr>
<tr>
<td>SD</td>
<td>442</td>
<td>269</td>
</tr>
<tr>
<td>Practices providing little acupuncture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (B)*</td>
<td>0.5</td>
<td>1207</td>
</tr>
<tr>
<td>2 (A)</td>
<td>0.5</td>
<td>3295</td>
</tr>
<tr>
<td>3 (A)</td>
<td>0.5</td>
<td>2421</td>
</tr>
<tr>
<td>4 (B)</td>
<td>0.7</td>
<td>1478</td>
</tr>
<tr>
<td>mean</td>
<td>2100</td>
<td>4563</td>
</tr>
<tr>
<td>SD</td>
<td>952</td>
<td>1174</td>
</tr>
<tr>
<td>Practices providing higher amounts of acupuncture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (C)</td>
<td>1.3 737</td>
<td>2698</td>
</tr>
<tr>
<td>2 (A)</td>
<td>1.4</td>
<td>1846</td>
</tr>
<tr>
<td>3 (B)</td>
<td>1.5</td>
<td>1396</td>
</tr>
<tr>
<td>4 (A)</td>
<td>5.6</td>
<td>3686</td>
</tr>
<tr>
<td>mean</td>
<td>1916</td>
<td>4390</td>
</tr>
<tr>
<td>SD</td>
<td>1265</td>
<td>1969</td>
</tr>
</tbody>
</table>

Data on prescribing costs in three PCTs and eight practices offering different numbers of acupuncture appointments per week. Practices are arranged by number of weekly acupuncture appointments.

*The letter in brackets indicates the practice’s PCT.

Discussion

This pilot study of three PCTs suggests that data on GPs’ referral rates and prescription costs are unlikely to be reliable enough to provide any useful information on the possible savings made by GPs who offer an acupuncture service.
Data inaccuracies

The three PCTs were asked to provide a list of their GP practices. It was often difficult to identify the individual practices clearly because in some databases they were listed by the name of the surgery building and in others by the name of the senior partner. Some surgeries worked from two sites, and it was not obvious whether the information returned covered one or both. All PCTs had a website listing their practices, and the details given there differed significantly from the printed lists supplied (one of which was three years old). Sometimes the practices had split, or moved, or a senior partner had retired; it was clear that the websites and lists were not regularly updated.

One of the research sites and one of the PCTs were experiencing major disruptions in their email service at the time of the survey, which caused additional problems.

For the two PCTs who were able to provide the email addresses of their practice managers, 6/85 (7%) of the addresses were incorrect. Often these were typographic errors, but it seems strange that such information (which would appear to be crucial to the day-to-day running of the organisations) had not been checked and corrected.

The accuracy of some of the information supplied was questionable. Where referral information was provided by the PCT relating to the researchers’ own practices, it was possible to check it directly against the practice-held records. This verification process identified two examples where a data filter had been applied inappropriately by the PCT, giving results less than one tenth of the true figure. Another data processing error was identified because the number of orthopaedic first attendances per thousand population listed by one PCT was only 20% of that seen in the other PCTs. When errors were identified, the corrected data were used in this study.

Classification problems

Referral data also proved to be problematic. The PCTs did not hold data on the number of GP referrals, but only on first attendances in outpatient clinics. These were categorised in different ways between the PCTs. In one area, rheumatology figures were...
not held separately from ‘General medicine’. In some PCTs, all patients with back pain were seen by a triage service which was classified under ‘physiotherapy’; in other areas these were classed as ‘orthopaedic’. There was a particular problem with counting physiotherapy referrals. Two of the PCTs had contracts with four different physiotherapy providers. Both PCTs supplied referral data for only one of the providers, one without providing any explanation of the omission.

Fracture Clinic attendances were classified by all PCTs as ‘orthopaedic’. These were largely A&E referrals, not under GP control, and so were not relevant to our research. It would have been helpful to exclude them, but they could not be identified separately. We were told by one PCT that fracture clinic figures were ‘very low’, though in another PCT they comprised ‘around 50% of the total orthopaedic figures’.

Access to data
Generally speaking, the use of a request under the Freedom of Information Act resulted in a reply within the statutory 20 days. One problem occurred where the request was made by email to an officer who had left the PCT, and the request was not actioned or forwarded. When this setback was discovered the email was sent again to another person, but there was still no response after 21 days. An email to the PCT Complaints Officer resulted in an apology, but still no data. A subsequent phone call gained a promise to email the data that day. When it did not arrive, a second phone call revealed that it had been sent, but to the wrong (incomplete) email address. The numbers eventually arrived but appeared to be too low, and a subsequent request for a breakdown of the figures uncovered the reason: only the out-of-area attendances had been provided, and not those at the local hospital (the majority). This final piece of information was never received. It is unclear what redress is available when an organisation fails to meet the terms of the Freedom of Information Act.

Variations in referral and prescribing rates
There is good evidence already of wide variation between practices in referral rates to all secondary care facilities. There are few published data with which we can directly compare the actual referral rates we observed in this study. A study of GP referrals in Staffordshire, using outpatient data, also found wide variation in referral to orthopaedic
outpatients: among 63 practices the mean was 9.5 (SD 2.3) per 10 000 per month, equivalent to about 11.4 per 1000 per annum. This is markedly lower than our figures. O’Cathain and colleagues reported that hospital clinic records suggested a referral rate of 11.7 per 1000 to physiotherapy in 1991/2, also about 12.5 per 1000 orthopaedic referrals and about 2.5 per 1000 rheumatology referrals in 1992.

Physiotherapy referral rates rose to about 31 after introduction of practice based provision, which may explain some of the high figures in our data. O’Cathain also noted that, as physiotherapy was introduced at practice level, referrals to orthopaedic and rheumatology clinics tended to reduce. However, similar but smaller changes were also observed in practices not involved in the scheme, indicating that several factors influence the pattern of GP referral. Data supplied by one PCT also show the wide variation in referral rates to physiotherapy among different practices in the course of two years, from no referrals to 36 per 1000 patients.

There is also evidence that doctors vary significantly in their prescribing habits, Hawkey and colleagues found a greater than six fold variation in rates of NSAID prescribing, and identified certain factors that influence the rate including the number of partners, age, sex and deprivation index of practice population and number of temporary residents. Data provided to us by another PCT show a five fold variation in referral rates to physiotherapy among different practices.

The reorganisation of the PCTs in England in April 2006 caused major disruption, and may well have contributed to some of the problems that we experienced in obtaining accurate statistics. Nonetheless, this type of information is currently being used to support major and expensive Practice Based Commissioning decisions, and therefore it is important that it is of high quality and that specific queries can be answered quickly and accurately. It is worrying that many of the errors we encountered during this project only came to light because we had access to inside information. These were not trivial mistakes; in some cases the numbers were wrong by a factor of ten. We urge caution in interpreting any data obtained in this way.

### Summary points

- Studies by individual acupuncture practitioners have given an indication that offering acupuncture in primary care may reduce the need for referral to secondary care and reduce the costs of prescriptions.
- This is the first survey of the effects of provision of acupuncture in UK general practice, using data provided by the NHS.
- The survey uncovered a wide variation in the availability of the service in different areas.
- No consistent differences were demonstrated in the prescribing or referral rates that could be due to the use of acupuncture in GP practices.
- Inaccuracies and variations in presentation of data by the PCTs made the results unreliable.

### Conclusion

We have conducted the first published survey of the effects of provision of acupuncture in UK general practice using data provided by the NHS, and uncovered a wide variation in the availability of the service in different areas. We have been unable to demonstrate any consistent differences in the prescribing or referral rates of such practices; the wide variance in the data means that if such a trend exists, a very large survey would be needed to identify it. However, the practicalities of access to data would make a nationwide survey too time-intensive, and data inaccuracies would make the results too unreliable.

Practice Based Commissioning has stimulated a large increase in data collection relating to hospital referrals. The Freedom of Information Act has improved the availability of such data. Both of these changes have the potential to open new avenues for primary care research, but our experience has shown that PCTs had considerable difficulty in extracting the required information, and did not always understand the subtleties of its classification.

### Acknowledgement

The study was partially funded by the MITRATrust. We acknowledge with thanks the help of the acupuncturists, the practice managers, and various PCT and PPA staff who helped us with this project. Adrian White was also supported by the DH-National
Co-ordinating Centre for Research Capacity Development (National Institute for Health Research).

Conflict of interest
The first and last authors have no conflict of interest. The second author is Editor of this journal.

Reference List

Editorial handling
In view of the second author’s conflict of interest as Editor of this journal, all editorial handling and decisions about acceptance of this article were carried out by Simon Hayhoe on behalf of the editorial board.
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Acupunct Med 2008 26: 205-213
doi: 10.1136/aim.26.4.205

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