Between the hospital specialist and patient, non-compliance is that which occurs at the interface between primary and secondary (hospital) care. Changes in drug regimens recommended by the hospital specialist may not be implemented due to deficiencies in communication between the hospital specialist and patient, between the hospital specialist and the general practitioner (GP), or because of poor supervision of and support for the patient. These deficiencies are likely to present a particular problem in PD, where recommended changes are often complex [8]. Alternatively, the patient may have valid reasons for not carrying out recommended changes. These may include side effects experienced on making the change or improvement in the underlying condition before alteration of treatment.

Non-completion of alterations in therapy is one component of non-compliance that may be easier to improve with changes to health care systems. While there is some literature on compliance in PD, we found no studies that have specifically reported completion of changes to treatment regimens in PD.

We, therefore, assessed self-reported completion of changes to medication in patients with PD attending a Neurology Outpatient Clinic.

Subjects and methods

The case notes of all people with PD, undergoing regular follow-up between June 2001 and June 2005 who were seen by a single consultant neurologist at his general neurology and movement disorder outpatient clinic, were examined retrospectively. Patients attending the same consultant's research clinic were not included, as this was felt to differ significantly from routine hospital care. The consultant's letters to the patient's GP were of a standard format, with sections for present treatment and recommended changes to treatment. Hospital policy was not to issue outpatient prescriptions at the clinic, but to ask the patient's GP to implement any change. If recommended treatment changes had not been taken place by the next clinic visit, it was standard practice to enquire as to the reason for this and, where a reason was given, record it in the case notes. PD patients were seen at least yearly, and from 4 to 6 months after any change to medication. Owing to limited resources, no PD specialist nurse was present at the clinic, but patients could be referred to a PD nurse clinic if this was thought necessary.

Clinic letters were searched manually for recommended changes to medication. The nature of these changes was recorded. Clinic visits were only logged where at least one change had been recommended. Where changes had been advised, subsequent letters were examined for evidence that this advice had been acted on and, if recommendations had not been followed, letters were examined for an explanation.

For the purposes of data collection, completion of a recommendation was considered to have taken place where the change remained in place when the patient was next seen at clinic. Statistical analysis was carried out using the $\chi^2$ test.

Results

Between June 2001 and 2005, 71 people with PD were seen in the clinic. The hospital records of ten of these could not

Non-completion of changes to prescribed medications in people with Parkinson's disease

Sir—Compliance, the degree to which prescribed drug therapy is followed, is poor among the chronically ill [1, 2] including those with Parkinson's disease (PD), even though drug therapy can significantly decrease morbidity [3, 4]. Measures that improve compliance in other conditions improve outcomes [5, 6], but current methods for improving compliance are generally unreliable and labour intensive [7].

One aspect of non-compliance that has received little attention is that which occurs at the interface between primary and secondary (hospital) care. Changes in drug regimens recommended by the hospital specialist may not be implemented due to deficiencies in communication between the hospital specialist and patient, between the

References


doi:10.1093/ageing/afm002
Published electronically 9 March 2007
Research letters

Table 1. Number of recommended changes by drug class and nature of change
(Number of changes not completed shown in brackets.)

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Start + /− titrate up</th>
<th>Increase</th>
<th>Decrease/stop</th>
<th>Change within class</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-dopa</td>
<td>24 (5)</td>
<td>33 (9)</td>
<td>5 (1)</td>
<td>2 (0)</td>
<td>65 (15)</td>
</tr>
<tr>
<td>Dopamine agonists</td>
<td>21 (8)</td>
<td>18 (5)</td>
<td>7 (1)</td>
<td>3 (0)</td>
<td>49 (14)</td>
</tr>
<tr>
<td>Anticholinergics</td>
<td>5 (1)</td>
<td>2 (1)</td>
<td>3 (2)</td>
<td>0 (0)</td>
<td>10 (4)</td>
</tr>
<tr>
<td>Adjuvants</td>
<td>7 (1)</td>
<td>1 (0)</td>
<td>5 (0)</td>
<td>0 (0)</td>
<td>13 (1)</td>
</tr>
<tr>
<td>Domperidone</td>
<td>16 (11)</td>
<td>2 (0)</td>
<td>9 (3)</td>
<td>0 (0)</td>
<td>27 (14)</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>3 (2)</td>
<td>0 (0)</td>
<td>1 (0)</td>
<td>2 (0)</td>
<td>6 (2)</td>
</tr>
<tr>
<td>Total</td>
<td>76 (28)</td>
<td>56 (15)</td>
<td>31 (7)</td>
<td>7 (0)</td>
<td>170 (50)</td>
</tr>
</tbody>
</table>

be retrieved. Of the remaining 61, twelve did not undergo any change to medication, leaving 49 patients to be included. Their mean age was 66.8 (SD 10.4, range 39–87). Thirty-two were male and 17 female.

A total of 132 clinic visits where changes to medication were recommended (median 2 per patient, range 1–8) were logged. In 23 of these, PD medication was being started for the first time. A total of 170 alterations to medication were recommended (median 1 per appointment, range 1–3).

Of these recommendations, 50 (29%) were not fully carried out.

The majority of recommended changes were to drugs containing L-dopa or dopamine receptor agonists (Table 1). Drugs classed as adjuvants included selegiline, amantadine and entacapone, whilst the miscellaneous category included antidepressants and beta-blockers. The percentage of changes not completed in each drug class was: 23% for L-dopa, 29% for the dopamine agonists, 40% for the anticholinergics, 8% for the adjuvants, and 52% for domperidone. There was a statistically significant difference in the proportion of recommended changes not completed between drug classes ($\chi^2 = 11.36, P = 0.04$, four degrees of freedom), which disappeared when domperidone was removed from analysis.

In most cases, no reason was given for non-completion of changes (Figure 1). Where an explanation was given for non-completion it was mainly due to side effects. One patient did not increase the dose of a drug because she felt her condition had improved without the change. Three halted the withdrawal of medication as they felt that it caused a worsening in their condition. Miscellaneous explanations included concomitant illness and patient reluctance.

By drug class, the numbers of non-completed recommendations where no reason was given were: 9 of 15 (60%) for L-dopa, 7 of 14 (50%) for dopamine agonists, none for anticholinergics, none for adjuvants, and 12 of 14 (86%) for domperidone.

Discussion

In this study, 29% of recommended medication changes were found not to have been completed. No reason was recorded for 60% of non-completed recommendations (50% excluding domperidone). The highest rates of total non-completion and non-completion without a reason were for domperidone, which was usually recommended for nausea. This may reflect reluctance of the patients to take yet another therapy where it was not considered essential to the treatment of their PD. However, there were also significant rates of non-completion for L-dopa and dopamine agonists, the main symptomatic therapies for PD.

There were several limitations in our study that should be noted. Firstly, these figures may well be underestimates as they relied on self-report, which has been shown to underestimate non-compliance [9]. It should also be noted that no attempt was made to assess whether patients were actually taking the tablets they were prescribed at the appropriate time. However, it seems that a significant proportion of treatment changes recommended by a hospital specialist were not fully carried out.

Secondly, this was a retrospective study. Thus, it is possible that the percentage of non-completions with no reason was overestimated, as some causes for non-completion of changes may have been identified at the clinic but not recorded in the notes. However, we feel that this is unlikely as it was standard policy to record any reasons given. A prospective study would be required to confirm these results and would also allow data to be collected on other factors that may have influenced non-completion, such as depression, cognitive status, pre-existing polypharmacy and social support.

Thirdly, the research clinic going on over the same period may have skewed the type of patient seen. Patients seen at the research clinic were newly diagnosed patients from 18 GP practices in Aberdeen [10]. New patients from other
practices and all prevalent patients referred to the consultant were included in this study.

Finally, our local practice is for treatment changes to be discussed with the patient and then recommended in the letter to the patient’s GP in the expectation that they will oversee the change and report any problems. It may not be possible to generalise our findings where different systems are in operation. Similar studies in differing healthcare systems would be of value.

There may be several reasons for the poor completion rate, one of which may be lack of concordance. Concordance relies on an agreement being reached between the doctor and the patient about which treatment to try. This differs from compliance, which describes the extent to which the patient follows the doctor’s instructions [11]. Patients may not have wished to make the recommended change but felt unable to communicate this to the doctor. It is also likely that deficiencies in communication or support played a significant role in non-completion. That is to say, either patients did not understand that a change was to be made or they were unable to effect this change with their current level of assistance. Anecdotally, it has been our experience that patients often report these as reasons for not making recommended changes. A further, prospective study would allow collection of qualitative data from patients about why they did not complete recommended changes.

There are a number of ways in which levels of completion may be improved. Written instructions to patients and carers for medication changes may be helpful in improving patient understanding of the changes being made. However, such interventions have been shown to have limited effectiveness in improving compliance [7] and even with them many patients may require support in order to make complex changes. Although we did not provide patients with a copy of their clinic letter routinely, changes of medication were often set out for them in a handwritten note.

Improved communication between the hospital and the GP via fax or email may be helpful if the GP was willing to supervise changes. However, anecdotally some GPs have told us that they do not feel that they are the appropriate people to oversee changes to medication, owing either to their lack of expertise in PD or lack of time to check on patients every few weeks. Alternatively, close supervision of changes to therapy by the recommending physician or a PD specialist nurse may improve completion. Indeed, in two of our patients where multiple incomplete recommendations had been made, supervision by a PD specialist nurse later allowed successful introduction of the medication. However, such a commitment would take up a significant amount of resources in terms of clinic capacity and consultant or nurse time, and is unlikely to be considered feasible in most UK centres in the present climate. PD specialist nurses remain a scarce resource. For example, the PD nurse in Grampian covers a population of around 500,000 and, at the time of the study, also looked after patients referred by three other consultant neurologists and at least three consultant geriatricians. Without a significant increase in staffing levels, they are unlikely to be available to supervise the majority of medication changes.

One group in the community who may be able to provide such supervision is the community pharmacists. They report themselves to be an underused resource [12], are likely to have the skills required and are already involved in providing the actual prescription. It is likely that they can be used without the costs that the use of doctors or specialist nurses in this role would incur. A project by the Medicines Partnership has recently assessed the role of community pharmacists in PD, and is expected to report its findings in the near future [13]. One possible system would be to send a copy of the clinic letter with the recommendation of medication change to the community pharmacist. They could then oversee the change and contact the hospital specialist, GP or PD nurse if any problems arose.

Non-completion of recommended medication changes in PD is an important component of non-compliance that may lead to over or under treatment of Parkinsonism or to unnecessary side effects. More extensive, prospective studies linked to trials of intervention are necessary to fully assess the extent of non-completion and attempt to improve the situation.

Key points
- Many changes to treatment recommended in our PD clinic were not completed.
- This may be due to a lack of available support for patients making complex changes.
- Community pharmacists may be a cost-effective means of providing this support.

Acknowledgements
RC is supported by a grant from the Parkinson’s Disease Society.

Conflict of interests
None declared.

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Research letters


doi:10.1093/ageing/afl175
Published electronically 31 January 2007

Assessing the impact of care management in the community: associations between key organisational components and service outcomes

SIR — Care management was introduced in the UK in the 1990 National Health Service (NHS) and Community Care Act. Originally envisaged for people whose needs were complex or required significant levels of resource—to coordinate care, review needs and to use resources to good effect [1]—care management for older people has developed in a varied manner across England. A common observation has been the lack of differentiation of care management arrangements: a form of targeting whereby different levels of service response are triggered by different levels of need [2–5]. In particular, the implementation of an intensive care management service is rare [5] despite evidence of the effectiveness of a more targeted approach [4, 6, 7]. A second feature has been the infrequent development of integrated systems of care management for older people [8]. This is despite care management being continually cited as the cornerstone of coordinated care and key to providing integrated care packages for frail older people with complex needs [1, 9].

More recently, the concept of care management has been reintroduced into older people’s services by government policy aiming to support people with long-term conditions at particular risk of repeated hospital admissions [10]. Nurse-led, and re-badged care management, it nonetheless incorporates elements of targeting and integration common to care management as it was first envisaged.

Research has estimated that over 80 per cent of decisions to place older people into care homes may be explained by the characteristics of the individual and that supply factors, whilst significant, do not add to this [11]. Thus, differences in the care management arrangements developed by individual social services departments may explain at least some of the residual variation in care home admissions and, potentially, other indicators of performance in older people’s services. Using the key features of variation in care management arrangements described by Challis et al. [12–14], we aimed to determine which, if any, were associated with the variation in performance.

Design and methods

This study employed multiple linear regression techniques using matched primary and secondary datasets. The primary data were collected as part of a national postal survey of care management arrangements for older people across all English local authorities (n = 131), conducted in 1997/98 and securing a 77 per cent response rate [13, 14]. Ten variables were selected for the current analysis:

- Budget devolved to first tier management or below (81% of survey respondents)
- NHS staff involved in all core tasks of care management (12%)
- Existing NHS care managers for older people (21%)
- Two or more tiers of assessment (85%)
- All review periods specified (55%)
- Usually continuity of care manager from assessment onwards (42%)
- Care management staff based in specialist older people’s teams (53%)
- Some evidence of targeting of services in relation to needs (51%)
- Average active caseload size <30 (36%)
- Existing small caseload, high needs service (intensive care management) (6%)

Two controlling variables were added to the regressions: social services net expenditure per head of the population.