Evaluation of a pharmacist independent prescriber in a diabetes clinic

Anna Bowron, Steve Williams, Naveed Younis, Julie Morris

Background: A previous study showed that pharmacists can safely and reliably make pharmacotherapy recommendations to aid adherence to diabetes treatment guidelines. *Aim:* To establish if there is difference between the ability of a pharmacist independent prescriber (PIP) or a medical prescriber to attain recommended metabolic targets in people with type 2 diabetes. *Methods:* Retrospective data on the metabolic targets and weight for 50 people who had been seen by the PIP in a type 2 diabetes clinic and 50 who had seen a doctor within a 2-year period were assessed. *Results:* For all study participants, the mean reduction in cholesterol levels from baseline to follow-up visit was greater for the PIP group compared with the medical prescriber group (P=0.038). For those with a blood pressure (BP) >130/80 mmHg at baseline, the mean reduction in diastolic BP was greater for the PIP group (n=20) compared with doctor group (n=26); the mean between-group difference was –7.8 mmHg (P=0.003). *Conclusion:* An experienced PIP can have a positive impact on patient outcomes in a type 2 diabetes clinic to help in the attainment of national targets.

Article points

1. In this study, metabolic results of people with type 2 diabetes seen by either a doctor or a pharmacist independent prescriber (PIP) were compared to determine if there was any difference in attaining recommended targets.
2. Restropective data on metabolic results at baseline and follow-up clinic visits were collected and compared for the two groups.
3. The results suggest that an experienced PIP was equivalent to the doctors at achieving targets of blood pressure, lipid levels and glycaemic control.

Key words

- Medical prescribers
- Pharmacist prescibers
- Type 2 diabetes

Authors' details can be found at the end of this article.

The UK is facing a huge increase in the number of people with diabetes. Since 1996, the number of people diagnosed with diabetes has increased from 1.4 to 2.6 million. By 2025 it is estimated that >4 million people will have diabetes in the UK (Diabetes UK, 2010). Most of these additional cases will be type 2 diabetes, as a consequence of an ageing population, and of a rapidly expanding obese population. Diabetes UK (2005) reported that the UK has the fastest growing rate of obesity in the developed world, and indicated that obese people are up to 80 times more likely to develop type 2 diabetes than those who maintain a healthy weight.

To reduce this growing health crisis there is a need to increase awareness of the risks, bring about changes in lifestyle, improve

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1. With the close link between obesity and type 2 diabetes, there is a growing need for an increasing number of non-medical prescribers to help healthcare professionals meet the tight national targets, helping reduce the development and progression of diabetes-related complications.
2. The purpose of this study was to evaluate whether a pharmacist independent prescriber could attain metabolic targets among individuals attending a hospital type 2 diabetes clinic.
3. Data for the study were retrieved by a retrospective case note review from the Trust's diabetes database for 50 people who had seen the pharmacist in the type 2 diabetes clinic between January 2007 and December 2008. Similar data for a control group of 50 people seen by a medical prescriber were also collected.

self-management among people with diabetes and improve access to integrated diabetes care services (Diabetes UK, 2005). With this close link between obesity and type 2 diabetes, there is a growing need for an increasing number of non-medical prescribers to help healthcare professionals meet the tight national targets, helping reduce the development and progression of diabetes-related complications.

The role of a pharmacist as part of the multidisciplinary diabetes healthcare team has expanded in recent years and includes direct patient care and clinical activities (Anaya et al, 2008). This has led to improvements in the outcomes of people with diabetes, with reductions in hospital admission rates and improved quality of life (QOL) in the expanding UK diabetes population (Anaya et al, 2008; McLean et al, 2008).

A previous study at the University Hospital of South Manchester Foundation Trust (UHSMFT) indicated that an experienced clinical pharmacist can safely and reliably aid adherence to treatment guidelines and assist in reaching diabetes treatment targets (Williams and Younis, 2006).

Aim

The purpose of this study was to evaluate whether a pharmacist independent prescriber (PIP) could attain metabolic targets among individuals attending a hospital type 2 diabetes clinic. The objectives were:

- To assess set health outcomes for people with type 2 diabetes seen by either a doctor or PIP.
- To compare metabolic results (HbA_{1c} levels, blood pressure [BP] and cholesterol levels) and weight.
- To compare the metabolic results with targets recommended by evidence-based guidelines.

Methods

Data for the study were retrieved by a retrospective case note review from the Trust's diabetes database for 50 people who had seen the pharmacist in the type 2 diabetes clinic between January 2007 and December 2008. Data for the metabolic targets and weight were collected for both the baseline and follow-up clinic visit. Similar data for a control group of 50 people seen by a medical prescriber were also collected.

Male and female adults attending the UHSMFT type 2 diabetes clinic between January 2007 and December 2008 who were followed-up for 2–14 months from baseline visit by either a clinic doctor or a pharmacist were included. Individuals seen by both the PIP and clinic doctor on the baseline visit, those seen by a consultant endocrinologist, those on insulin therapy who may have had input from the DSNs and those who had been admitted as inpatients for diabetes-related problems, were excluded.

Statistical analysis

Statistical analysis was carried out for both groups initially and then further analysis was carried out adjusting for follow-up time from baseline. Statistical significances were measured by analysis of covariance (ANCOVA) using the Statistical Package for the Social Sciences (SPSS version 15.0) and $P<0.05$ was considered significant.

Differences between the two groups at follow-up were assessed, adjusting for baseline readings. Secondary analyses on the subgroup of people with less variable follow-up (between 6 and 12 months), and for subgroups with high initial cholesterol levels (>4 mmol/L) and high initial BP (>130/80 mmHg) were also undertaken.

Results

The mean time from baseline to follow-up visit was 7.5 months for the PIP group (range 2–14 months) and 8.2 months for the doctor group (range 3–14 months).

The initial analysis showed that the mean reduction in cholesterol levels at follow-up was greater for the PIP group compared with the medical prescriber group ($P=0.038$) (*Table 1*). There was also a trend towards greater reductions in HbA_{1c} levels for the PIP group, but these were not statistically significant.

A further analysis of participants who were followed-up between 6 and 12 months (31 from the PIP group and 41 from the doctor goup) was carried out, as this was deemed the average follow-up time for the majority of clinic attendees. The mean

Table 1. Results of initial analysis of all study participants.

	Baseline mean		Adjusted follow-up mean*		Mean difference	Significance
	Pharmacist (*n*=50)	Doctor (*n*=50)	Pharmacist	Doctor	(pharmacist–doctor) (95% CI)	(ANCOVA)
Cholesterol (mmol/L)	3.99	4.20	3.70	3.93	–0.23 (–0.45 to –0.01)	*P*=0.038
Systolic BP (mmHg)	140.6	138.8	139.6	136.5	3.1 (–3.6 to 9.8)	*P*=0.36
Diastolic BP (mmHg)	74.1	72.3	72.7	74.5	–1.8 (–5.5 to 1.9)	*P*=0.34
Weight (kg)	92.6	85.9	87.7	87.2	0.5 (–3.2 to 4.3)	*P*=0.78
HbA_{1c} (% [mmol/mol])	7.31 [56.1]	7.22 [55.2]	7.08 [53.8]	7.32 [56.2]	–0.24 [–2.6] (–0.53 to 0.06)	*P*=0.12

*The follow-up results were adjusted for baseline differences between the two groups using SPSS; BP=blood pressure; CI=confidence interval.

Table 2. Results of analysis of participants who were followed-up between 6 and 12 months.

	Baseline mean		Adjusted follow-up mean*		Mean difference	Significance
	Pharmacist (*n*=31)	Doctor (*n*=41)	Pharmacist	Doctor	(pharmacist–doctor) (95% CI)	(ANCOVA)
Cholesterol (mmol/L)	4.01	4.08	3.59	3.87	–0.28 (–0.56 to 0.01)	*P*=0.056
Systolic BP (mmHg)	138.5	138.4	133.5	134.3	–0.8 (–10.0 to 8.3)	*P*=0.85
Diastolic BP (mmHg)	72.8	71.4	70.3	74.1	–3.8 (–8.3 to 0.7)	*P*=0.10
Weight (kg)	86.8	84.9	79.8	80.6	–0.8 (–6.3 to 4.6)	*P*=0.76
HbA_{1c} (% [mmol/mol])	7.00 [53.0]	7.12 [54.2]	6.82 [51.2]	7.06 [53.6]	–0.24 [–2.6] (–0.57 to 0.09)	*P*=0.15

*The follow-up results were adjusted for baseline differences between the two groups using SPSS; BP=blood pressure; CI=confidence interval.

reduction in cholesterol levels at follow-up was again greater for the PIP group compared with the doctor group (see *Table 2*). This was a borderline significant result (*P*=0.056), owing to a smaller group size. No other statistically significant results were found between the two groups in the subanalysis.

Additional analysis of the 37 individuals who had a cholesterol level of >4 mmol/L at baseline was undertaken (12 from the PIP group and 25 from the doctor group), as this was the national cholesterol target at the time of study. The mean cholesterol level for all participants of the subanalysis was 4.8 mmol/L at baseline. The mean cholesterol for the PIP group at follow-up was 4.18 mmol/L compared with 4.46 mmol/L in the doctor group; thus, the mean reduction in cholesterol level was slightly greater for the PIP group. The mean difference between the two groups was –0.27 (95% confidence interval [CI], –0.76 to 0.21; *P*=0.26).

Additional analysis of participants who had a BP of >130/80mmHg at baseline was undertaken (20 from the PIP group and 26 from the doctor group), as this was the national BP target at the time of the study. The mean BP for all participants in the subanalysis was 148.5/75 mmHg at baseline. The mean diastolic BP (DBP) for the PIP group at follow-up was 68.6 mmHg compared with 76.3 mmHg in the doctor group. The mean systolic BP (SBP) for the PIP group at follow-up was 131.3 mmHg compared with 139.3 mmHg in the doctor group.

The mean reduction in DBP was significantly greater for the PIP group compared with doctor group. The mean difference between the two groups was –7.8 mmHg (95% CI, –14.3 to –1.3; *P*=0.003). The mean reduction in SBP was slightly greater for the PIP group compared with the doctor group. The mean difference

Page points

1. Among the study participants who were followed-up between 6 and 12 months, the mean reduction in cholesterol levels at follow-up was greater for the pharmacist independent prescriber (PIP) group compared with the doctor group (*P*=0.056).
2. Among the participants who had a cholesterol level of >4 mmol/L at baseline, the mean reduction was slightly greater for the PIP group compared with the doctor group (*P*=0.26).

"This study, although not fully statistically significant, showed that a pharmacist independent prescriber specialising in type 2 diabetes was equivalent to doctors of specialist registrar grade and below in ensuring national metabolic targets were attained in a well-controlled type 2 diabetes population."

between the two groups was –7.9 mmHg (95% CI, –20.0 to 4.1; *P*=0.10).

Discussion

Overall, the results suggest that an experienced PIP was equivalent to the doctors at achieving targets of BP, lipid levels and glycaemic control. The study proved to be too small to give statistically significant results for all the parameters analysed, but showed a small reduction in the major metabolic parameters considered to be important in controlling type 2 diabetes and reducing the risk of micro- and macrovascular complications (UK Prospective Diabetes Study [UKPDS] Group, 1998).

In the UKPDS (UKPDS Group, 1998), it was shown that the risk of complications were reduced by 35% for each percentage point reduction in HbA_{1c} level and that reducing cardiac parameters of cholesterol levels and BP were more important than controlling blood glucose levels within the recommended range. Studies have also documented cost benefits, improved symptoms and improved QOL for people with diabetes by reducing HbA_{1c} levels (Testa and Simonson, 1998; Wagner et al, 2001; Department of Health, 2006).

Limitations of the present study include that only short-term outcomes for participants up to 14 months from baseline were assessed. Further studies should analyse patterns of change in metabolic parameters compared with frequency of attendance to the clinic. In addition, owing to the retrospective nature of the study, participants could not be initially randomised to see either the pharmacist or the doctor before data were collected. The variation in follow-up time between the groups led to further analysis to adjust for these differences. A prospective study on participants with a standardised, 6-month follow-up might give more accurate results as no adjustment would be needed for time. However, this would be difficult to achieve as follow-up times naturally vary as a result of factors that cannot be changed (i.e. holidays, missed appointments, hospitalisation). The average baseline metabolic results for all participants of this study were reasonable, reflecting a group of people with relatively well-controlled type 2 diabetes, which made large reductions in metabolic targets unlikely for both groups.

Conclusion

This study, although not fully statistically significant, showed that a PIP specialising in type 2 diabetes was equivalent to doctors of specialist registrar grade and below in ensuring national metabolic targets were attained in a well-controlled type 2 diabetes population. A larger study is warranted to assess the long-term outcomes of people treated by a PIP in a type 2 diabetes clinic. ■

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