Original research

Six-monthly diabetes monitoring of well-controlled patients: Experiences of primary care providers

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A B S T R A C T

Aims: To examine experiences of primary care providers with six-monthly diabetes monitoring of well-controlled patients.
Methods: This study was part of the EFFIMODI study, examining whether six-monthly monitoring of well-controlled (HbA1c ≤58 mmol/mol, systolic blood pressure ≤145 mmHg and total cholesterol ≤5.2 mmol/l) type 2 diabetes patients results in equivalent cardiometabolic control compared to three-monthly monitoring. Primary care providers completed a questionnaire about their experiences with six-monthly monitoring, whether they want to continue six-monthly monitoring and for which type of patients six-monthly monitoring is sufficient.
Results: Of 163 questionnaires, 157 (96.3%) were completed and returned. Only 14 (8.9%) primary care providers were negative about the six-monthly monitoring and 102 (65.0%) would like to continue six-monthly monitoring. Primary care providers disagreed about patients’ ability to determine their own monitoring frequency and whether six-monthly monitoring was suitable for all well-controlled type 2 diabetes patients. Practical concerns emerged such as the inability to declare healthcare costs and the unsuitability of electronic health record systems.
Conclusions: Almost two out of three primary care providers would like to continue six-monthly monitoring of well-controlled type 2 diabetes patients. However, some diabetes care providers should be convinced and some practical concerns should be solved.

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1. Introduction

Worldwide, the number of people with type 2 diabetes was approximately 366 million in 2011 [1]. As a result of ageing and population growth along with lifestyle changes, this number is expected to increase with over 50% by 2030 [1]. This may result in a heavy burden for health care workers and increasing costs.

For patients with type 2 diabetes regular monitoring is necessary to keep the disease under control. International diabetes guidelines recommend different monitoring frequencies...
Monitoring frequencies vary widely between physicians [4–6], and the frequency of visits is mainly determined by the physician, and to a lesser extent by patient factors and disease severity [7–10]. Physicians commonly prefer a shorter visit interval than recommended in guidelines [11] or preferred by their patients [12].

At this moment, it is not known how frequently monitoring is required and who should determine this. Reducing the monitoring frequency of well-controlled type 2 diabetes patients may generate considerable savings of workload and healthcare costs. With the EFFIMODI study we have demonstrated that after eighteen months well-controlled diabetes patients in primary care who were monitored six-monthly did as well as patients who were monitored three-monthly (submitted).

This finding could lead to a worldwide adjustment of the current guidelines on the frequency of diabetes monitoring, but before such an adjustment will have a chance to get implemented, experiences of health care providers and patients with six-monthly monitoring should be examined to identify potential bottlenecks for implementation in clinical practice. These considerations can also contribute to the discussion about who should make the decision about the monitoring frequency in clinical practice: the care provider, the patient or both? Here we describe the experiences of general practitioners and practice nurses with six-monthly monitoring of well-controlled type 2 diabetes patients.

2. Materials and methods

2.1. Setting

This study is part of a randomised controlled patient-preference equivalence trial (EFFIMODI study [13]) in primary care. Between April 2009 and August 2010 patients with type 2 diabetes were included in the EFFIMODI study if they were known with type 2 diabetes for more than one year, between 40 and 80 years old, treated by the general practitioner, not using insulin and with HbA1c ≤ 58 mmol/mol (≤ 7.5%), systolic blood pressure ≤ 145 mmHg and total cholesterol ≤ 5.2 mmol/l.

At baseline, patients were asked whether they had a strong preference for three-monthly or six-monthly monitoring. Those with a strong preference for either three-monthly or six-monthly monitoring were treated according to their preference, while those without a strong preference were randomised to either three-monthly or six-monthly monitoring.

Here the experiences of the primary care providers with the six-monthly monitoring of well-controlled type 2 diabetes patients are described. 233 general practitioners from 107 different practices across the Netherlands participated in the EFFIMODI study. Twenty-four held a solo practice and the others were working within a duo or group practice.

2.2. Measurements

When all patients within the practice had completed the study period of eighteen months (and before study outcomes were known), the practices received a questionnaire on their experiences with six-monthly monitoring. So the questionnaire concerned only patients who were monitored six-monthly during the EFFIMODI study, which were 1074 out of the 2215 participating patients. Of these, 677 (63.0%) preferred themselves to be monitored six-monthly and 397 (37.0%) had been randomised to six-monthly monitoring [14]. A questionnaire was sent to each practice; if two separate patient lists were used within a practice, two questionnaires were sent resulting in 163 questionnaires. The questionnaire consisted of five questions:

1. Who completed the questionnaire: the general practitioner or the practice nurse?
2. How did you experience the six-monthly monitoring: very good, good, neutral, bad or very bad?
3. Would you like to continue the six-monthly monitoring in the future: yes, no or ‘I do not care’?
4. Do you agree or disagree with the following six statements about six-monthly monitoring (multiple answers possible)?
   - Six-monthly monitoring saves time compared to usual care.
   - Patients are able to determine their own monitoring frequency.
   - The health insurance company requests that I monitor all patients quarterly.
   - In the future, I will leave the decision about the monitoring frequency to the patient.
   - Patients are not able to determine their own monitoring frequency.
   - Six-monthly monitoring takes more time compared to usual care.

Or they could fill in their own statement.

5. Which type of type 2 diabetes patients are eligible for six-monthly monitoring: no patients whatsoever, young patients with type 2 diabetes, patients who are well-controlled for a long time or otherwise (multiple answers possible)?

The answers to the open questions were assigned to a matching statement or if frequently mentioned a new category was created. Answers that were mentioned only once or twice were assigned to the category ‘other’. All answers were independently classified by two different researchers (JJ and FW) and then compared. When the researchers disagreed a discussion followed to achieve consensus. The statements of question four were also divided into positive, neutral and negative statements.

2.3. Statistical analysis

Descriptive statistics were used to describe the experiences with six-monthly monitoring and whether participants want to continue six-monthly monitoring. Since multiple answers were possible with regard to questions four and five, we counted the number of primary care providers who agreed with a statement and divided this by the total number of agreed statements. Analyses were performed with SPSS software version 20.
3. Results

Of the 163 questionnaires sent to the participating general practices, 157 (96.3%) were completed and returned. The questionnaires were filled in by 19 (12.1%) general practitioners, 90 (57.3%) practice nurses, 3 (1.9%) by both and of 45 (28.7%) questionnaires it was unclear who completed it.

3.1. Experiences with the six-monthly monitoring

Of the primary care providers, 15 (9.6%) had very good experiences with six-monthly monitoring, 60 (38.5%) had good experiences, 67 (42.9%) were neutral, 14 (9.0%) had bad experiences, none had very bad experiences and one answer was missing. Of the responders, 102 (65.0%) would like to continue six-monthly monitoring, 35 (22.3%) did not want to continue, 19 (12.1%) were ambiguous in this respect and one answer was missing.

In Table 1, the experiences of primary care providers with six-monthly monitoring are summarised. The most frequently mentioned statement was that six-monthly monitoring saves time (23.4%). The most frequently mentioned negatively worded statement was that patients are not able to determine their own monitoring frequency (11.3%). In the category ‘other positive aspects’ the following statements were made: “six-monthly monitoring improved self-management and motivation of patients” and “it will make healthcare more efficient”. The category ‘other neutral’ and ‘other negative’ contained the following statements: “the electronic patient records system could not handle six-monthly monitoring”, “less frequent monitoring caused patient’s non-compliance” and “patient-physician contact was limited”.

3.2. Opinion about patients’ eligibility for six-monthly monitoring

In Table 2, the view of primary care providers on which patients were eligible for six-monthly monitoring is shown. Most frequently, patients who are well-controlled for a long time were considered eligible (70.3%). Besides the eligibility criteria in Table 2 additional selection criteria for six-monthly monitoring were mentioned by the primary care providers, such as older age, higher education, no history of cardiovascular disease and a normal Body Mass Index.

4. Discussion

This study demonstrated that more than ninety percent of the primary care providers had neutral or positive experiences with six-monthly monitoring of well-controlled type 2 diabetes patients and almost two out of three would like to continue six-monthly monitoring. These judgements were based on varying grounds. Time savings were the most important reason to continue with six-monthly monitoring. Besides, the primary care providers believe that patients who are well-controlled for a long time are the most eligible patients for six-monthly monitoring.

| Table 1 – Primary care providers’ experiences with six-monthly monitoring (n = 157). |
|-----------------------------------------------|-------|
| Statements | N (%) |
| Positive | 197 (50.6%) |
| Six-monthly monitoring saves time compared to usual care | 91 (23.4%) |
| Patients are able to determine their own monitoring frequency | 47 (12.1%) |
| For well-controlled type 2 diabetes patients, monitoring every six months is enough | 20 (5.1%) |
| Six-monthly monitoring meets the desire of the patients | 19 (4.9%) |
| Six-monthly monitoring makes it possible to offer customised care | 14 (3.6%) |
| Other positive aspects | 6 (1.5%) |
| Neutral | 76 (19.5%) |
| The health insurance company requests that I monitor all patients quarterly | 43 (11.1%) |
| I prefer to determine the monitoring frequency myself, in agreement with the patient | 15 (3.9%) |
| In the future, I will leave the decision about the monitoring frequency to the patient | 14 (3.6%) |
| Other neutral aspects | 4 (1.0%) |
| Negative | 116 (29.8%) |
| Patients are not able to determine their own monitoring frequency | 44 (11.3%) |
| Six-monthly monitoring is not suitable for all well-controlled type 2 diabetes patients | 20 (5.1%) |
| Six-monthly monitoring takes more time compared to usual care | 18 (4.6%) |
| Because patients were not regularly seen, the diabetes deregulated or patients no longer showed up at appointments | 16 (4.1%) |
| Patients visited the general practice more frequently in between scheduled appointments | 10 (2.6%) |
| Difference in monitoring frequency led to confusion among patients and/or primary care providers | 6 (1.5%) |
| Other negative aspects | 2 (0.5%) |
| Total | 389 (100%) |

* The numbers indicate how many times a statement is mentioned. Because multiple answers were possible, the total number of statements exceeds the total number of questionnaires.

| Table 2 – Primary care providers’ opinion about which patients are eligible for six-monthly monitoring (n = 157). |
|---------------------------------------------------------------|-------|
| Which patients should receive six-monthly diabetes monitoring in the future? | N (%) |
| Patients who are well-controlled for a long time | 147 (70.3%) |
| Patients who are well-controlled for a long time and have a good understanding of disease | 14 (6.7%) |
| Patients who are well-controlled for a long time and who prefer less frequent monitoring | 9 (4.3%) |
| Young patients with type 2 diabetes | 9 (4.3%) |
| Patients who are well-controlled for a long time and who are good at self-management | 7 (3.3%) |
| No patients whatsoever | 3 (1.4%) |
| Other patients | 20 (9.6%) |
| Total | 209 (100%) |

* The numbers indicate how many times a statement is mentioned. Because multiple answers were possible, the total number of statements exceeds the total number of questionnaires.
The results of our study did not show considerable objections by primary care providers to implement six-monthly monitoring. However, physicians commonly prefer a shorter visit interval than recommended in guidelines [11] or preferred by their patients [12]. This could be explained by the fact that more frequent monitoring in chronic diseases is thought to lead to better patient outcomes. Several studies have investigated the relation between the monitoring frequency and patient outcomes in patients with type 2 diabetes [15–19], but the results were inconclusive. The EFFIMODI trial showed that in well-controlled type 2 diabetes patients cardiometabolic control was equal for three-monthly and six-monthly monitoring and fear of worsening of diabetes control should thus not be a major objection to implement six-monthly monitoring (article submitted). In addition, six-monthly monitoring might save costs, both for the practice and the patient.

A practical problem which some general practices faced was the inability to get their diabetes care reimbursed, since the health insurance companies that pay a lump sum to cover all the various components of diabetes care for a fixed period of time request to check all patients with diabetes every three months. Another practical concern was the inability of some electronic health record systems to deal with six-monthly monitoring. This caused problems with keeping an overview and scheduling appointments, resulting in confusion among patients, practice nurses and general practitioners. However, this practical problem can be solved by adapting the computer system and good communication between primary care providers and patients.

According to the general practitioners and practice nurses in our study only patients who are well-controlled for a long time should be eligible for six-monthly monitoring. Besides, they should also fulfil additional criteria, both subjective (understanding of disease and self-management) and objective (older age, higher education, no history of cardiovascular disease and a normal body mass index). Whether these additional criteria actually affect cardiometabolic control of the patients is unknown, since we only selected well-controlled patients based on HbA1c, systolic blood pressure and total cholesterol.

Currently, monitoring frequency of chronic disease patients is mainly determined by physician-related factors [7–10]. Other factors, such as the disease severity, account for only a small part. As a result, the monitoring frequency for patients with chronic diseases varies widely between physicians [4–6], even if the severity of disease is similar.

Our study aimed to contribute to the discussion about who should decide about the monitoring frequency in primary care: the care provider, the patient or both? The participating primary care providers differed in opinion whether patients are able to determine the monitoring frequency themselves. However, almost two-thirds of the well-controlled type 2 diabetes patients would like to choose their own monitoring frequency, with the choice for more frequent monitoring being associated with worse disease status compared to patients who prefer less frequent monitoring [14]. Patients therefore seem to make logical decisions in this aspect. So it seems justified to take their opinion into account when deciding about the monitoring frequency. This might also increase patients' compliance.

Our sample of participating healthcare providers was widely spread over the Netherlands. The percentage of general practitioners working in solo practices and participating in EFFIMODI (10%) was somewhat lower than on average (18% in 2011 [20]) in the Netherlands. This could be due to the fact that some solo practices have no practice nurse or less time available for study participation. Although our study included less solo practices than on average, we do not think this influenced our results.

One of the strengths of this study is its high generalisability because a large number of general practices across the Netherlands participated. The answers of the diabetes care providers were based on an eighteen months experience in daily care in patients who were selected independently and based on solely objective measures, namely HbA1c, blood pressure and total cholesterol.

There are also some limitations that should be mentioned. Firstly, when processing the questionnaires it became apparent that fifteen questionnaires were identical to others. This was recognised by identical answering and handwriting in questionnaires that came from the same practice. We decided to include these questionnaires in the analysis assuming that these were completed double (or triple) because the primary care providers shared the same opinion. However, in this way it is possible that a single person completed two questionnaires without consulting anyone else. Secondly, the opinions of the primary care providers in this study were based on six-monthly monitoring of patients with and without a strong preference for this frequency. If the monitoring experiences of these groups could have been analysed separately, the results might have been different because patients who chose the monitoring frequency themselves may be more satisfied and motivated. Finally, from a substantial number of questionnaires it was unknown if general practitioner, practice nurse or both completed it. Therefore it was impossible to stratify the experiences for general practitioners and practice nurses.

We would suggest that primary care physicians and diabetes nurses propose a six-monthly monitoring scheme to all type 2 diabetes patients who are overall well-controlled for about a year and that only in case of explicit patient's objections to such a scheme the three-monthly scheme will be maintained. Of course, primary care providers and the patient should evaluate their experiences after a certain period. Six-monthly monitoring is not meant as a rigid schedule, but should be adjusted according patients' and providers' needs. Because the majority of primary care providers had positive experiences with six-monthly monitoring of well-controlled diabetes patients and would like to continue with it, implementation on a large scale seems possible. However, some diabetes care providers should be convinced and some practical concerns should be solved.

Conflicts of interest

The authors declare that they have no conflicts of interest.
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