

A prison based nurse-led specialist diabetes service for detained individuals

Lesley Mills, BA(Hons), MPhil, Dip SexHealth, RGN, Senior Diabetes Nurse Specialist, Department of Diabetes, Warrington and Halton Hospitals NHS Foundation Trust, UK

Correspondence to: Lesley Mills, Senior Diabetes Nurse Specialist, Department of Diabetes, Warrington Hospital, Lovely Lane, Warrington WA5 1QG, UK; email: lesleymills99@hotmail.com

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Introduction

Managing diabetes can be difficult enough for anyone who is living with the condition. When the person who has diabetes is detained within the prison setting, then it is arguably even more difficult. Isolated in a prison cell for up to 23 hours a day, these people may not have easy access to food and drinks when needed. They may not be in possession of their medications or insulin. They may not be able to go to the gym if and when they would like to do so. These are the day-to-day problems that people in prison face.

There are 138 prisons in England with a male population of nearly 80 500 and a female population of approximately 4000.¹ More than 140 000 people move through the English prison system each year. Around 5% of these inmates have diabetes. The United Kingdom (UK) prison population is increasing each year.² The prison environment highlights issues and health needs in that 'hard to reach' group of people.

In 2003, the Secretary of State for Health assumed responsibility for securing a full range of medical care and services for prisoners'

Summary

This study aimed to examine whether providing a nurse-led specialist diabetes service within the prison setting can improve the management of diabetes by reducing HbA_{1c} – thus reducing hospital admissions for hypoglycaemia and diabetic ketoacidosis and, in turn, reducing UK National Health Service costs. Monthly nurse-led clinics were carried out to review prisoners' diabetes management and control.

The study prospectively monitored the care of diabetic men serving a prison sentence in a large English prison during a 12-month period within a specialist nurse-led diabetes clinic, and compared the outcomes to the previous 12 months before the clinic was set up. The study subjects comprised 27 male prisoners – of whom 37% have type 1 diabetes and 63% have type 2 diabetes – all detained in one prison, HM Prison Risley, in the north west of England. Main outcome measures were: reduction in hospital and accident and emergency (A&E) admissions; reduction in the rate of failed attendance at hospital outpatient clinic appointments ('did not attend') and in the rate of cancelled consultant outpatient clinic appointments; and improvement in diabetes management and control.

The results showed that hospital admission rates reduced, with only two admissions in 12 months. One was due to hypoglycaemia (overdose) and one due to infection. There were no admissions for diabetic ketoacidosis. Baseline HbA_{1c} was 74mmol/mol (8.9%); range 39–108mmol/mol (5.7–12.0%). At one-year follow up, HbA_{1c} had decreased to 58mmol/mol (7.5%); range 56–119mmol/mol (7.3–13.0%). The number of episodes of severe hypoglycaemia in the preceding 12 months was greatly reduced from 17 to 1 ($p < 0.001$).

It was concluded that prisoners should be offered care that meets national standards. They should have access to medication and education to help manage their diabetes. Commissioning of services for prisoners with diabetes needs to be addressed if this has not already been done. A comprehensive approach to the care of people with diabetes can be an effective way in which to improve overall health and prevent acute/chronic complications. Providing a prison based nurse-led specialist diabetes service within a prison can reduce hospital admissions, reduce the number of hospital outpatient clinic appointments, improve patient outcomes and ultimately save the UK National Health Service a substantial amount of money.

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Key words

offender health; prison setting; improving health outcomes; diabetes specialist nurse

health in England and Wales; this was transferred from the Home Office to the Department of Health and down to the local primary care trusts.³

This health care varies from prison to prison. Even within the local area of the north west of England, diabetes care differs greatly. The five-year review paper on delivering the National Service Framework for diabetes, released in 2008 by the Department of Health,⁴ demonstrated that individuals with diabetes, whatever the environment, should have access to knowledge and be empowered to manage

their diabetes in order to achieve a good quality of living. However, giving offenders such empowerment may have both a negative and positive effect.

The provision of prison health care in the UK has historically been suboptimal.⁵ In over a decade later, this has not changed in many prisons in England. In a comparative study looking at health care services, the authors demonstrated that prisoners consulted prison health care workers approximately 23 times per year, 77 times more frequently than men in the community.⁶ Many of these appointments

with prison health care staff are spent dealing with minor ailments that, in the community, are dealt with by self-care and over-the-counter medication, to the detriment of care for those with chronic diseases.⁷

The prison setting itself is detrimental to both physical and mental health, as identified in a paper published by the Department of Health in 2002.⁸ However, for some inmates, prison provides an opportunity to access health care which, for a variety of reasons, they have not been able to obtain previously.⁷ In addition, there are opportunities to promote health within the prison environment.^{4,8}

Background and study aims/design

HM Prison Risley, Warrington, UK, has about 1100 inmates at any one time and is in the top 20 of the largest prisons in the UK. The prison mainly houses category B prisoners. 'Category B' prisoners are those who cannot be trusted not to try and escape. Many of the offenders are serving long-term or life sentences.

All offenders with diabetes are given a 'medical extras' pack of fruit, milk, biscuits and salad rolls, to help prevent hypoglycaemia overnight. All prisoners are only given 30–60 minutes of exercise per day outside their cell. Some prisoners are allowed to be 'in possession' of their medications, others are not. The decision is made by the health care department as to whether or not the offender is safe to be 'in possession'. All of the prisoners are in possession of their blood glucose monitoring equipment, lancets and test strips, and have small sharps bins in their cells.

This current study aimed to examine whether providing a nurse-led specialist diabetes service within the prison setting can improve the management of diabetes and

reduce hospital admissions due to hypoglycaemia or diabetic ketoacidosis and, in turn, reduce overall costs. This was completed by comparing the outcomes from the previous 12 months prior to the start of the nurse-led clinic versus prospective monitoring of all prisoners with known diabetes for the following 12-month period (March 2012 to March 2013).

At the time, within the prison's 1100 inmates there were 56 men with diabetes (5.09%). Of these, 27 (48%) were able to be seen and followed up for the 12 months in the diabetes specialist nurse-led clinic held in the prison every month.

Methods

Traditionally, HM Prison Risley inmates requiring a secondary care review would be referred to the hospital-based diabetes service and would be seen in the outpatient department of the hospital by the diabetes team.

A retrospective audit was carried out for the previous 12-month period via the IT department. This was done to find out the number of prisoners who had attended an outpatient clinic or the accident and emergency (A&E) department, or had been admitted to the hospital for a diabetes-related condition – i.e. diabetic ketoacidosis, hypoglycaemia. Data were then collected and analysed for this 12-month period to give a baseline number of: clinic appointments attended; failed clinic appointments (i.e. 'did not attend' [DNA]); number of admissions to A&E; and number of admissions to a ward. These patients were then identified and those who were still being held at the prison were prospectively followed up for the next 12 months in the new nurse-led specialist diabetes clinic held within the prison health care department.

The senior diabetes specialist nurse clinic is held once-monthly to which men are referred via the prison health care clinic. The patients have a new patient appointment followed by an average of one new and two follow-up appointments. The clinic's aim was to: reduce hospital and A&E admissions; reduce DNAs and cancelled consultant clinic appointments held at the local hospital; improve diabetes management and control; and in-reach to a largely disadvantaged population.

These patients were monitored at 0, 6 and 12 month intervals. Their glycaemic control, hospital admissions, or hospital attendance were reviewed at these intervals. Subjects were followed up at intervals, where they had intervention from the specialist nurse and, where necessary, the prison pharmacist. Bloods were taken, weight assessed, and patients' own blood glucose monitoring was reviewed. Correspondence was sent to the prison general practitioner at each visit and a summary placed on the prison computerised health care record. The intervention group's progress was compared with that of the previous year's matched cohort who had had routine diabetes clinic care only.

Results

During the 12 months, 27 male prisoners with diabetes were reviewed regularly by the specialist nurse; 37% had type 1 diabetes and 63% had type 2 diabetes. Table 1 shows the age of these men (age range 21–65 years [mean age 42.7 years]). These men had a duration of diabetes from 2–35 years (mean 13.3 years).

In the year before inauguration of the nurse-led clinic, 17 men had attended the hospital A&E department for treatment of a severe hypoglycaemia episode. During the following 12 months, only one prisoner needed to be taken to the hospital A&E department following

an intended overdose of insulin – a reduction from 17 to 1 ($p < 0.001$).

Baseline data on hospital admissions showed that there had been six diabetes-related admissions in the previous year. However, this had improved to an incidence of only two in the following 12 months – one was due to a hypo and one due to infection. Of the six admissions in the previous year, three had been due to diabetic ketoacidosis. There were none in the year following inauguration of the nurse-led clinic. Sick day rules and illness management education for the health care staff and the prisoners has had an impact on these figures.

Routinely, before introduction of the nurse-led clinic, these 27 prisoners would have been sent to the hospital outpatients' department for review and, if they attended, two prison officers would have been required to escort each of them on all occasions. Sometimes the prison would be unable to send the prisoner; at other times the prisoner might refuse to attend. This would equate to a total of 132 outpatient clinic appointments in the 12 months; however, as the subsequent nurse-led clinic was held within the prison, these appointments were not required – nor were the escorts.

In the 12 months before introduction of the nurse-led clinic there had been a 'failed to attend' rate of 16%. After inauguration of the nurse-led clinic, there were no failures to attend, as the nurse would review the prisoner either in the health care unit within the prison or in the prisoner's cell if they were unable to walk over to the unit.

Diabetes metabolic control was assessed by HbA_{1c} measurements. In the 27 men, HbA_{1c} measured at baseline of the initial assessment within the nurse-led clinic was 74mmol/mol (range 39–108mmol/mol [$8.9 \pm 1.5\%$; 5.7–12.0%]). Repeated measurements were obtained at six

Age range	No. of patients
18–25 years	5
26–39 years	8
40–49 years	6
50–59 years	4
60–69 years	4

Table 1. Number of study subjects by age range

months and then at 12 months at which point HbA_{1c} levels had decreased to 58mmol/mol (range 56–119mmol/mol [$7.5 \pm 1.5\%$; 7.3–13.0%]) showing that overall control had improved significantly ($p = 0.002$). The prisoner who had increased their control from 39mmol/mol to 56mmol/mol was someone who had been regularly experiencing hypos and had had several A&E admissions in the previous year. At the other end of the range of hypos he deliberately ran himself high in order to reduce this risk. Overall, the other 25 men did well in maintaining their improved control, with only mild hypos reported in a few of them.

Discussion

Back in 1991 the UK had 47 000 people in prison;⁹ today, that number is nearer 85 000.¹ Given that prison has a very transient population and that inmates are moved from one prison to another, it is often difficult to follow up patients over a long period of time. Much has been written around the care of prisoners with diabetes.^{9,10} There are deficiencies that include: a lack of care planning and case management; inadequate dietary support and lack of self-monitoring facilities; lack of specialist health professional input; and unstructured medical follow up.^{9,11,12}

The current study, carried out in one prison over 12 months, assessed 27 prisoners with diabetes. Forty-eight percent of these men were <40 years of age and the rest were <69 years old. A prison population is usually younger: 60% of prisoners in the UK have been reported to be <30 years of age, and there has been found to be a very low prevalence of diabetes, with a figure of about 0.6–0.8% of the prison population.⁶

Glycaemic control is fundamental to the management of diabetes. Some prisoners have poorly controlled diabetes on arrival, and their glycaemic control actually improves while in prison due to regular medication, meals and a good exercise regimen. For others, however, the rigid routines, volatile environment and general lack of understanding about diabetes can cause problems.³

A management plan to achieve normal or near-normal glycaemia at the time of initial medical evaluation is important.¹³ However, these management plans to achieve good control should be developed and goals should be individualised to each prisoner. Aiming for an HbA_{1c} of 53mmol/mol (7.0%) may be too tight a level of control with someone who is fearful of hypos when locked in a single prison cell 23 hours a day. Some prisoners – particularly the younger male who has never been in a situation where he has to look after himself – may find the thought of not having access to help as quickly as usual too stressful, and then deliberately run higher in order to prevent the risk of hypos. It is well documented that: 'There is an understandable concern about the risk of hypoglycaemia, with many prisoners not prepared to place themselves at risk of an unrecognised or nocturnal hypoglycaemic episode, especially in prisons with no overnight health care provision.'³

Practice point

A prison based nurse-led specialist diabetes service for detained individuals

Hospital A&E department attendance rates prior to the inauguration of the nurse-led clinic had seen 17 attendances in a 12-month period for the treatment of severe hypoglycaemia. This was reduced to only one episode in the prospective 12 months, and this was following an intended overdose of insulin by a prisoner.

Hospital admission rates at baseline had shown that there had been six diabetes-related admissions, and this had improved to only two in the 12 months following introduction of the nurse-led clinic. None of the admissions during the latter period was for diabetic ketoacidosis which at baseline had comprised 50% of admissions.

The baseline HbA_{1c} level within this group of prisoners was 74mmol/mol (8.9%). All prisoners had access to blood glucose monitoring; they were given, or already had, meters that would test for both glucose and blood ketones as required, and both meter and strips/lancets were held in possession by the prisoner. By equipping the prisoner with the right tools, and setting individual targets that are agreed by both the health care professional and prisoner, overall glycaemic control was significantly improved by 16mmol/mol (1.4%). At one-year follow up, HbA_{1c} had decreased from 74mmol/mol (8.9%) to 58mmol/mol (7.5%).

Any group of people who have diabetes and are being detained will need to be supervised by prison medical and nursing staff. This requires access to services, and it can be very difficult to use a diabetes specialist service if the prison relies on prison officer escorts to the clinic, or if the inmate refuses to attend or does not know why and where they are going. If the prisoner requires a hospital outpatient appointment, they will need two escorts. In a previous study, it was stated that 18 of 19

KEY POINTS

- Prison health care in the UK has historically been suboptimal
- A diabetes specialist nurse (DSN) led service within the prison setting can improve diabetes management, and reduce hospital admissions due to hypoglycaemia and diabetic ketoacidosis
- A DSN led clinic within the prison setting can improve HbA_{1c}

prisoners 'reported frequent problems in obtaining staff to act as escorts to outpatient departments ... This led to frequent last minute cancellation of appointments at substantial cost to the NHS'.⁵ As a result, HM Prison Service has outlined that a member of a specialist team visiting the prison can be a good alternative service model and should be considered.¹¹

Did not attend (DNA) rates were 16% at baseline; this was reduced to zero in the prospective 12 months of the nurse-led clinic, as the specialist nurse could review the prisoner either in the health care department or by visiting the patient directly in their own cell.

The cost to the health service for one outpatient appointment just for the escort and transport alone amounts to £252, which is approximately 305 euros.¹¹ The cost of a new patient appointment and three follow-up appointments is £783 (*c.* 950 euros) under a locally-agreed tariff. These 27 patients alone would cost £48 357 (*c.* 58 900 euros) for their three outpatient clinic appointments and escort/transport costs over a 12-month follow up period. As the clinic was being held within the prison, neither transport no escort costs were relevant and, consequently, the cost saving to the trust amounted to nearly £40 000 (*c.* 48 700 euros).

Conclusions

This study has demonstrated the effectiveness of a nurse-led specialist diabetes clinic held within a prison setting for inmates with diabetes in order to reduce HbA_{1c}, severe hypos, A&E attendance and hospital admissions, and improve overall control of diabetes. It has shown that reviewing prisoners every month within the prison setting can significantly improve patient outcomes compared to the previous year where routine care was to attend a hospital-based clinic – if and when the prison could accommodate the movement of the prisoner along with two escorts. It has also shown that using a regular specialist nurse visiting the prison monthly can make the consultation and any changes in therapy acceptable to both the patient and the general practitioner concerned.

Commissioning of services for prisoners with diabetes needs to be addressed if this has not already been done. A comprehensive approach to the care of people with diabetes can be an effective way to improve overall health and prevent acute/chronic complications. As this study has shown, changing the way a service has been provided can help reduce overall National Health Service (NHS) costs on failed clinic attendance appointments (DNA) and prison transport/escort costs. Providing quality diabetes services to all sections of society, however, is a major challenge and can prove to be even more problematic when it is difficult to engage with certain groups. Prisoners should be offered care that meets national standards. 'The provision of a specialist clinic provides an excellent opportunity for joint working and training of the prison health care providers.'³ Without adequate support, however, these groups are likely to have periods of poor diabetes control and are at risk of developing major complications.¹⁴

Providing a prison based nurse-led specialist diabetes service within a prison is incredibly hard work but extremely rewarding. As this study has demonstrated, it can reduce hospital admissions, reduce the number of hospital outpatient clinic appointments, improve patient outcomes and, ultimately, save the NHS a substantial amount of money.

Declaration of interests

There are no conflicts of interest declared.

References

1. Prison population figures. 2013. <https://www.gov.uk/government/publications/prison-population-figures> [accessed 8 March 2013].
2. Prison statistics England and Wales 2001. UK: Home Office, 2003.
3. Robson S. Providing diabetes care in prisons: experiences of joint working with prison health care. *J Diabetes Nurs* 2009;13(10):396–9.
4. Five years on: delivering the diabetes National Service Framework. UK: Department of Health, 2008.
5. Read J, Lynne M. The quality of health care in prison: results of a year's programme of semistructured inspections. *BMJ* 1997;315:1420–4.
6. Marshall T, *et al.* Health care in prisons: A health care needs assessment. UK: University of Birmingham, 2000.
7. Condon L, *et al.* A review of prison health and its implications for primary care nursing in England and Wales: the research evidence. *J Clin Nurs* 2007; 16(7):1201–9.
8. Department of Health and HM Prison Service. Developing and modernising primary care in prisons. London: Department of Health, 2002.
9. Gill GV, *et al.* Diabetes care in British prisons: existing problems and potential solutions. *Diabet Med* 1992;9(2):109–13.
10. Diabetes UK. Having diabetes in prison. 2010. www.diabetes.org.uk/How_we_help/Advocacy/Advocacy-packs/Having-diabetes-in-prison/ [accessed 28 Nov 2012].
11. Nagi D, *et al.* Diabetes service redesign in Wakefield HM high-security prison. *Diabetes & Primary Care* 2012;14(6): 344–50.
12. Booles KD. Survey on the quality of diabetes care in prison settings across the UK. *J Diabetes Nurs* 2011;15(5):168–76.
13. American Diabetes Association. Standards of medical care in diabetes – 2008. *Diabetes Care* 2008;31(Suppl 1):S12–S54.
14. Bellary S. Delivering diabetes care to people in hard-to-reach groups. *Diabetes & Primary Care* 2011;13(6):358–66.