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Delivering diabetes care to people in hard-to-reach groups

Srikanth Bellary

Learning objectives

After reading this article, the participant should be able to:

1. Outline the main barriers to gaining access to, and delivering care to, hard-to-reach groups.
2. Identify the healthcare needs of each hard-to-reach group.
3. Discuss the evidence for interventions to improve diabetes care in each hard-to-reach group.

Key words

- Adolescent
- Homeless
- Mental health problems
- Prison
- South Asian

Srikanth Bellary is Senior Lecturer in Metabolic Medicine at Aston Research Centre for Healthy Ageing (ARCHA), Aston University, Birmingham.

Delivering diabetes care to people who do not or cannot attend for appointments in primary care can be challenging. People in such hard-to-reach groups include individuals with mental health problems, those in prison, adolescents, homeless people and migrant ethnic groups. This article looks at the challenges of delivering diabetes care to people in hard-to-reach groups and reviews the evidence for improving their care.

The prevalence of diabetes has almost doubled over the past few years and is expected to rise further (Diabetes UK, 2010). In parallel with the growing challenge of diabetes and its complications, the past few decades have witnessed several advances in the field of diabetes. Better insights into the pathogenesis of diabetes, availability of new therapies, importance of risk factor control and structured care delivery have all transformed the way in which most people with diabetes receive their care (American Diabetes Association [ADA], 2011a). However, inequalities in access to health care persist, and while a majority of people are able to access improved diabetes care, there are still groups that are hard to reach and fail to receive the same standard of care.

Examples of such hard-to-reach groups include people with mental health problems, those in correctional institutions, adolescents, homeless people, migrant ethnic groups and older people (Diabetes UK, 2006; a PCDS CPD module on diabetes management in older people is available online). Although the complex socioeconomic and cultural factors that define each of these groups are unique, they do have many similarities. These groups remain on the fringes of our healthcare system, have irregular contact with healthcare professionals and may often present as emergencies or with advanced complications. Healthcare professionals' ability to deliver high-quality care to these groups is further compromised by the paucity of scientific evidence and the lack of understanding of their needs. This article summarises some of the

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difficulties in reaching out to these groups and reviews the available evidence on improving care for these people.

Diabetes and mental health problems

The relationship between mental illness and diabetes is bi-directional. Diabetes can be associated with depression (de Groot et al, 2001) and, similarly, severe mental illness (SMI) increases the risk of diabetes (Dixon et al, 2000). Increased risk of diabetes in people with severe mental illness has been well reported. Risk of diabetes is two- to four-times greater in these individuals and can be attributed to obesity, poor lifestyle, family history and the use of psychotropic medications (Dixon et al, 2000; Lamberti et al, 2004). Diabetes may already be present at the time of diagnosis of SMI in many individuals and the risk of developing the condition increases with increasing duration of their mental illness. In addition to diabetes, people with SMI also have poorly controlled cardiovascular risk factors. Mortality associated with cardiovascular disease is also significantly greater than that observed in the general population (De Hert et al, 2009).

There are no long-term studies looking at glycaemic control in individuals with SMI and it is difficult to establish if SMI is independently associated with poor diabetes outcomes. Despite this, people with SMI often fare worse than those without. People with SMI tend to be younger, are more likely to be obese and have higher rates of smoking. Further, it has been reported that people with SMI are less likely to be screened or treated for cardiovascular risk, which may explain the high rates of mortality reported in these people (Felker et al, 1996; De Hert et al, 2009).

Adherence to diet, lifestyle and treatment may also be poor, particularly during relapse of mental illness, adding to the difficulties in achieving good control of diabetes and other risk factors. There is some evidence, however, to suggest that the outcomes in people with SMI treated adequately may not be dissimilar to those without mental illness (Brown et al, 2010). In general, the principles

of management of diabetes and cardiovascular disease in those with SMI are the same as those in the general population and every effort must be made to achieve the glycaemic and non-glycaemic targets in these individuals (De Hert et al, 2009).

The metabolic effects of psychotropic agents have been well recognised for some time. As individuals with SMI are on these agents long-term, understanding the effects of these agents on glycaemic control and other metabolic risk factors is important (Holt and Peveler, 2009; ADA et al, 2004).

Atypical antipsychotic agents (clozapine, olanzapine, risperidone, aripiprazole) have clear advantages over the older antipsychotic drugs in controlling the negative symptoms of schizophrenia but have more undesirable metabolic effects (Allison and Casey, 2001; Lieberman et al, 2005). Weight gain is frequently associated with the use of antipsychotic medications and can enhance the risk of diabetes. The relative effects of these agents on body weight, however, are quite variable.

Among the older agents, chlorpromazine and thioridazine are associated with more weight gain than fluphenazine and haloperidol, while with the newer agents, the effect on weight is more pronounced with clozapine and olanzapine compared with risperidone or aripiprazole (Tschoner et al, 2009). Weight gain with olanzapine could be as much as twice of that seen with risperidone (Allison and Casey, 2001; Koro et al, 2002). Acute hyperglycaemic emergencies have been reported with antipsychotic agents although the occurrence of these events is rare. Treatment with these agents is generally associated with increased fasting glucose levels and incidence of diabetes increases as early as 6 months after treatment with these drugs.

Diabetes is significantly associated with depression (Gask et al, 2011). Although depression in diabetes can occur at all stages, the risk of depression increases with duration of diabetes and development of complications, particularly painful diabetic neuropathy (de Groot et al, 2001). Depression is associated

Page points

1. Diabetes can be associated with depression and, similarly, severe mental illness (SMI) increases the risk of diabetes.
2. In addition to diabetes, people with SMI also have poorly controlled cardiovascular risk factors. Mortality associated with cardiovascular disease is also significantly greater than that observed in the general population.
3. The metabolic effects of psychotropic agents have been well recognised for some time. As individuals with SMI are on these agents long-term, understanding the effects of these agents on glycaemic control and other metabolic risk factors is important.
4. Diabetes is significantly associated with depression. Although depression in diabetes can occur at all stages, the risk of depression increases with duration of diabetes and development of complications, particularly painful diabetic neuropathy.

Page points

1. Delivering standard diabetes care to people with mental illness is a major challenge. Poor outcomes in these individuals are largely due to failure in delivering standard care and lack of clarity about who should take the ownership of care for these people.
2. Studies that have looked to improve care and develop care models in people with mental illness have shown that by proper engagement, diabetes care can be significantly improved.
3. Health care needs of the migrant population can be different to that of the indigenous population and are mainly influenced by inherent susceptibility to certain diseases, cultural and socioeconomic factors.

with poor glycaemic control and treatment of depression in turn can be associated with modest improvements in glycaemic control (Lustman et al, 2000). Given the strong association between diabetes and depression it is now advised that people with diabetes are actively screened for depression.

Delivering standard diabetes care to people with mental illness is a major challenge. Poor outcomes in these individuals are largely due to failure in delivering standard care and lack of clarity about who should take ownership of care for these people. This lack of ownership was highlighted in a recently published joint statement by the European Psychiatric Association and European Society of Cardiology (De Hert et al, 2009). Given that these people have frequent interactions with the primary care and mental health teams, it is logical that a shared care approach that involves the primary care physicians and the mental health team, supported by the specialist diabetes team, would be the most appropriate strategy.

Studies that have looked to improve care and develop care models in people with mental illness have shown that by proper engagement, diabetes care can be significantly improved (Kahn et al, 2009). However, the successes of such models in a wider population are not fully established and more research is needed to develop models of care that are effective in delivering long-term diabetes care.

Diabetes in ethnic migrant populations

Migration of people from south Asian and Caribbean countries to the UK began initially in the 1950s. Subsequently, following political unrest in Africa and more recently economic difficulties, migration has resulted in a gradual increase in the non-white British population (Barnett et al, 2006). According to recent estimates, people of non-white ethnicity constitute approximately 9% of the total population of England and Wales.

Healthcare needs of the migrant population can be different to that of the indigenous population and is mainly influenced by inherent susceptibility to certain diseases, cultural and socioeconomic factors. People of south Asian ethnicity (Indian, Pakistani and Bangladeshi origin) have greater predisposition to develop diabetes than the white European population. Diabetes is up to six times more common in this ethnic group and often occurs 5–10 years earlier (Barnett et al, 2006). Significantly worse diabetes-related outcomes in this ethnic group have been reported in many studies. Cardiovascular disease is also common among south Asian people and mortality from cardiovascular disease is up to 1.5 times that observed in the local white population (Wild et al, 2007).

There are significant differences in risk factors between people of south Asian ethnicity and white European people. Although BMI is lower in south Asian people, the waist:hip ratios are greater and there is increased tendency for visceral obesity. For these reasons, standard cut-off values for BMI and waist circumference in white European populations may not be applicable to south Asian people. Lower cut-off values for defining obesity in south Asian people have therefore been proposed recently (Gray et al, 2011; *Table 1*). Typically, increased levels of triglycerides and low high-density lipid levels have been reported often in the presence of “normal” or only slightly elevated total cholesterol (Barnett et al, 2006). Compared with other ethnic groups, south Asian people have low physical activity levels, with the lowest levels reported in Bangladeshi women. Smoking rates, on the other hand, are reported to be much lower

Table 1. Proposed cut-off values for BMI and waist circumference (WC) for south Asian people compared with BMI cut-off of 30 kg/m² in white Europeans and WC cut-off of 102 cm and 88 cm for white European males and females, respectively.

	Body mass index (kg/m ²)		Waist circumference (cm)	
	Men	Women	Men	Women
Glycaemia factor*	22.6	21.5	83.8	69.3
Lipid factor*	26	23.9	91.4	74.2
Blood pressure factor*	28.4	29.1	99.3	86.6

* Factor is the single summary variable derived from the principal components analysis. Glycaemia factor includes fasting glucose, 2-hour glucose and HbA_{1c}; lipid factor includes HDL-cholesterol and triglycerides; blood pressure factor includes systolic and diastolic blood pressure. Adapted from Gray et al (2011).

in south Asian people, particularly among south Asian women (Fischbacher et al, 2004).

The insulin resistance phenotype commonly observed in this ethnic group is thought to contribute to the excess cardiovascular risk in south Asian people. Microvascular complications related to diabetes are also more common among south Asian people. Prevalence of retinopathy in south Asian people has been reported to be as high as 40% – a figure significantly greater than in the white European population (Raymond et al, 2009). Nephropathy is also reportedly more common among south Asians and a greater number of south Asians are known to require renal replacement therapy.

Although there are several reasons why south Asian people may be more prone to diabetes-related complications, a major proportion of this increased risk can be attributed to poor glycaemic control. Cross-sectional studies looking at glycaemic control in different ethnic groups have reported significantly higher HbA_{1c} levels in south Asians (Chowdhury et al, 2006; Mukhopadhyay et al, 2006). Poor adherence to a healthy diet, lack of physical activity and reluctance to start insulin therapy are some of the reasons contributing to poor glycaemic control (Khan et al, 2008). Likewise, blood pressure and dyslipidaemia may be sub-optimally managed and there is evidence to suggest that south Asian people are less likely to be prescribed statins and angiotensin-converting enzyme (ACE) inhibitors, although this has improved somewhat recently with the introduction of QOF (Bellary et al, 2008).

The difficulties in reaching out to the south Asian population have been highlighted in many studies (Barnett et al, 2006). The majority of the south Asian population in the UK is concentrated in inner city areas with a high deprivation index. Many south Asian women tend to be housebound and cultural issues and a fatalistic attitude to illness frequently result in delay in seeking help. Diets rich in carbohydrates and fat are common among south Asians and there is a reluctance to change traditional cooking practices. Other factors, such as language barriers, reliance on

alternative therapies and poor understanding of the risk of diabetes among south Asians and healthcare professionals, all contribute to the problems in delivering effective health care.

Although the problem of diabetes in this ethnic group is well recognised, there have been very few randomised clinical trials that have addressed the issue of improving diabetes care. The UK Asian Diabetes Study was a large cluster randomised controlled trial that evaluated a culturally sensitive approach towards improving diabetes care in south Asians (Bellary et al, 2008). The study failed to show improvements in glycaemic control despite providing additional resources to the intervention group. Findings of the UK Prospective Diabetes Study, which had a much smaller number of south Asian people, however, suggest that early intervention and control of risk factors can improve outcomes in this population (Davis et al, 2001).

Not many studies have looked at diabetes in the African-Caribbean population in the UK. Prevalence studies show that diabetes in black ethnic groups is more common than the general population, and although language is less of a barrier, there are many other sociocultural factors that are unique to this ethnic group and can impact diabetes. While the focus of diabetes management remains on aggressive management of risk factors regardless of ethnicity, healthcare professionals must be made aware of the excess risk to these populations and effort must be made to screen these individuals early. Engaging community leaders and the use of link workers to increase the awareness of diabetes are a few of the approaches that have been shown to have some success and must be considered while commissioning services (Saxena et al, 2007).

Diabetes in adolescents

Adolescence is a turbulent period associated with biological, psychological and social changes, all of which can be highly stressful. It is not surprising that many individuals find it difficult to cope with diabetes during this period (Viner, 1999). Although type 1 diabetes is still the most common form of diabetes

Page points

1. The majority of the south Asian population in the UK is concentrated in inner city areas with a high deprivation index.
2. Although the problem of diabetes in this ethnic group is well recognised, there have been very few randomised clinical trials that have addressed the issue of improving diabetes care.
3. The UK Asian Diabetes Study failed to show improvements in glycaemic control despite providing additional resources to the intervention group.
4. Adolescence is a turbulent period associated with biological, psychological and social changes, all of which can be highly stressful.

Page points

1. Transition to adult diabetes services and the need to assume charge of their diabetes can be unsettling during adolescence. Lack of continuity of care and the difficulties in adapting to the changing circumstances lead to disengagement and a period of poor diabetes control.
2. Risk-taking behaviour, missing insulin doses and infrequent monitoring of blood glucose levels is common among younger people and often contributes to neglect of their diabetes.
3. Studies that have looked at strategies to improve clinic attendance of adolescents have shown that clinics located outside the hospital setting, evening clinics, and joint paediatric and adult transition clinics are successful in engaging these groups.

among adolescents, the number of children with type 2 diabetes has increased in recent years. While treatments may vary depending upon the type of diabetes, most of the issues associated with care delivery are common to both groups. The majority of those with type 1 diabetes are under the care of the paediatric team and often develop longstanding trusting relationships with paediatric diabetes teams (Kipps et al, 2002; Viner, 2000). Many of them also have a strong parental influence on their diabetes care. Transition to adult diabetes services and the need to assume charge of their diabetes can be unsettling during these years. Lack of continuity of care and the difficulties in adapting to the changing circumstances lead to disengagement and a period of poor diabetes control (Kipps et al, 2002; Helgeson et al, 2009). Issues associated with body image, peer pressure and increasing social responsibilities and expectations can place additional pressure on these individuals.

Tight glycaemic control may be difficult to achieve in adolescents (Urbach et al, 2005). HbA_{1c} values of around 8% (64 mmol/mol) have been reported in some studies and, although tighter control is possible, this is frequently associated with increased risk of hypoglycaemia (Diabetes Control and Complications Trial Research Group, 1994). The National Diabetes Paediatric Audit showed that good glycaemic control (HbA_{1c} <7.5% [<58 mmol/mol]) was achieved in only 14.5% of children and over 30% of children and adolescents had an HbA_{1c} of >9% (>75 mmol/mol) (NHS Information Centre, 2011). These figures suggest that there are significant gaps in the care of children and adolescents with diabetes. Risk-taking behaviour, missing insulin doses and infrequent monitoring of blood glucose levels is common among younger people and often contributes to neglect of their diabetes. Individuals with type 2 diabetes may also have other risk factors, such as hypertension and dyslipidaemia, and pose additional challenges.

A frequent problem reported with adolescents is non-attendance to diabetes clinics (Goyder et al, 1999). Although rates

vary considerably, non-attendance rates as high as 60% have been reported in some studies (Kipps et al, 2002). Studies that have looked at strategies to improve clinic attendance of adolescents have shown that clinics located outside the hospital setting, evening clinics, and joint paediatric and adult transition clinics are successful in engaging these groups. Novel methods, such as use of internet, social networking and text messages, have also been shown to be effective in improving clinic attendance and adherence to treatments (Franklin et al, 2006; Rasmussen et al, 2007).

Careful attention must be given to the needs of adolescents while planning diabetes services. Multidisciplinary transitional clinics involving paediatric and adult diabetes specialist teams should be developed (Visentin et al, 2006). The concept of transition must be introduced early and should involve the parents in the initial stages (Holmes-Walker et al, 2007). An important aspect of these clinics is to allow flexibility for adolescents to continue to receive support from the diabetes teams. The emphasis should be on ensuring that continuity of care and transition to adult clinics is based on each individual's readiness rather than by age. Models of care that include transitional care coordinators can be particularly useful in engaging adolescents and such models should be implemented wherever possible (Holmes-Walker et al, 2007).

Diabetes in the homeless

Although the number of people classified as homeless has decreased substantially over the past decade, the problem of homelessness is still a significant one. The latest UK government figures suggest that there are over 11 000 people classified as homeless and a further 48 330 households in temporary accommodation in England alone (National Statistics, 2011). Approximately 1700 people were estimated to be sleeping rough in England at any given time. The definition of homeless is broad and as many households have more than one individual, the actual number of homeless people could be even larger. There are very little data on the prevalence of diabetes among

homeless people in the UK. Diabetes prevalence rates of 6.2% in the homeless (as compared with 4.9% in the general population) have been reported in those living in France (Arnaud et al, 2010) and reports from Canada suggest a prevalence of about 3%, which is not greater than the general population (Hwang and Bugeja, 2000). A significant proportion of these had type 2 diabetes.

Although it is thought that homeless people have poor control of their diabetes, it is difficult to ascertain this in the absence of robust data. Reported differences in the degree of glycaemic control and the prevalence rates of complications between the studies may reflect the differences in the population backgrounds of the homeless people and the methods of data collection. Higher rates of foot problems have been reported in one study but this has not been verified in other studies (Arnaud et al, 2010). Other problems, such as substance abuse and mental health problems, are also common in homeless people and may contribute to poor health outcomes (Hwang and Bugeja, 2000; Hwang et al, 2011).

Homeless people are less likely to have access to a healthy diet and adhere to meal times especially if living in shelters. They are also less likely to monitor blood glucose levels or see a physician (Robertson and Cousineau, 1986). Some of the other difficulties reported by homeless people with diabetes include difficulties in scheduling, prioritising diabetes over other problems, securing insulin needles and syringes, exercising and obtaining medications (Hwang and Bugeja, 2000).

Homeless people are one of the hardest groups to reach, and due to the constant change in their abode may not have access to health care in the same way as the general population. Although classed as vulnerable, there is very little research into these groups and our knowledge about identifying and treating these individuals remains poor. Clearly, more research is needed to identify effective strategies that improve their care. Addressing their needs requires a coordinated effort by healthcare providers and councils to ensure better access to community and specialist diabetes

services. Keeping registers and contacting these individuals through social networks and charities could be explored. Sharing of best practice and showcasing innovative approaches may be another way to highlight the issues related to homeless people.

People in correctional institutions

The prison population in the UK has risen steadily over the past few decades. According to the latest figures released by the Ministry of Justice, there were over 87 000 people in correctional institutions in November 2011 (Berman, 2011). The demographics of the prison population is different to the general population. Over 80% of those serving prison sentences are men and many of them are of a younger age, although this has changed slightly due to tougher and longer sentencing.

Due to the constant changes in the number of people in custody, it is difficult to estimate the prevalence of diabetes in the prison population. Diabetes, however, appears to be a common chronic medical illness along with hypertension (MacFarlane et al, 1992).

Prisoners with diabetes can have significant problems managing their diabetes. Restrictions on diet, fixed meal times leaving long gaps between the evening meal and breakfast can cause problems for people requiring multiple injections (MacFarlane et al, 1992; MacFarlane, 1996). Difficulties in using needles, storing insulin and self-monitoring of blood glucose can be a major problem. Prisoners may not have access to food to be able to treat a hypoglycaemic episode and prison staff may not be familiar with symptoms and behaviour associated with a hypoglycaemic episode leading to delayed treatment (MacFarlane et al, 1992; Waring, 1996). They may not have regular access to specialist care and are likely to miss screening for diabetes complications. Mental health problems, alcohol dependence and substance abuse are common among many prisoners and may pose difficulties in achieving good control of diabetes.

Significant efforts have been made in recent years to improve health care for prisoners. The responsibility of commissioning health care

Page points

1. Homeless people are one of the hardest groups to reach, and due to the constant change in their abode may not have access to health care in the same way as the general population.
2. Addressing the needs of homeless people requires a coordinated effort by healthcare providers and councils to ensure better access to community and specialist diabetes services.
3. The prison population in the UK has risen steadily over the past few decades. According to the latest figures released by the Ministry of Justice, there were over 87 000 people in correctional institutions in November 2011.

Page points

1. There is some evidence to suggest that structured diabetes care can improve outcomes in prisoners. Strangely, prison may present rare opportunities to target a difficult and hard to reach group of individuals and improve their health.
2. Due to the chronic nature of diabetes, it is essential that adequate support is available to individuals with diabetes throughout their lifetime.
3. Providing quality diabetes services to all sections of society is a major challenge for healthcare providers. This can prove to be even more difficult when certain groups are difficult to engage with.

for prisoners in England was transferred to the NHS in 2004 and now rests with the PCTs. In Scotland, it is still provided by the Scottish Prison Service while in Wales, it is funded by the National Assembly for Wales. In Northern Ireland the Department of Health, Social Services and Public Safety takes responsibility for the commissioning and delivery of healthcare services in prisons. With the introduction of the new healthcare bill and formation of clinical care groups there is a renewed opportunity to strengthen these services.

There are clear guidelines for the management of people with diabetes in correctional institutions (ADA, 2011b). The position statement published by Diabetes UK (2005) recognises the problem of poor diabetes care in prisons and highlights the need for better services, including access to emergency and specialist care and regular screening for diabetes complications. There is some evidence to suggest that structured diabetes care can improve outcomes in prisoners. Strangely, prison may

present rare opportunities to target a difficult and hard to reach group of individuals and improve their health (MacFarlane et al, 1992). A strict diet, non-availability of alcohol, regular follow-ups and well-trained prison healthcare staff may, in fact, assist in achieving good control when supported by specialist teams. Multidisciplinary care involving specialist diabetes teams, dietitians and a podiatrist is similarly essential to ensure good care and needs to be considered while commissioning services.

Conclusion

Due to the chronic nature of diabetes, it is essential that adequate support is available to individuals with diabetes throughout their lifetime. Providing quality diabetes services to all sections of society, however, is a major challenge for healthcare providers. This can prove to be even more difficult when certain groups are difficult to engage with. Without adequate support, however, these groups are likely to have periods of poor diabetes control and are at risk of developing major complications.

While the needs of each of these groups are unique, a lack of consistent specialist input, influence of socioeconomic factors and the paucity of research are some of the common themes that emerge about these groups. Healthcare professionals and providers must recognise that these groups represent those who are most vulnerable and therefore most likely to benefit from timely intervention. The challenge of identifying, engaging and treating these individuals is huge, especially in times when resources are scarce. Equally, ensuring that the needs of these groups are met will require strong commitment and support from politicians and policy makers. ■

Box 1. Case report.

Narrative

Mrs Begum, a 65-year-old south Asian woman with type 2 diabetes, was referred to the hospital diabetes team to improve her glycaemic control. Mrs Begum had been diagnosed with diabetes 8 years earlier, and despite increases in oral antidiabetes medication she continued to have poor glycaemic control. Her last HbA_{1c} level prior to attending the clinic was 9.2% (77 mmol/mol) and her HbA_{1c} level over the 2 years prior to that was never below 8.5% (69 mmol/mol). She was taking metformin 1 g twice-daily and gliclazide 160 mg twice-daily and was reluctant to commence insulin. She was reviewed in the specialist clinic for her diabetes and was referred to a diabetes specialist nurse and an Asian link worker. After a few weeks of interaction with the team, she agreed to commence insulin treatment and also review her diet. Six months later, her HbA_{1c} level had improved to 7.6% (60 mmol/mol) and other risk factors were also well controlled.

Discussion

This case highlights the problems in treating people from ethnic minority groups. Lack of understanding of diabetes, cultural issues and language barriers are major factors that contribute to poor diabetes control in these groups. Reluctance to start treatments such as insulin in particular is a common problem. Use of Asian link workers who provide translation and can understand the domestic and social circumstances can be helpful in building trust and educating these individuals. Alternative methods such as involving a close family member in education and provision of care can also be very useful in engaging such individuals and often improves outcomes.

Allison DB, Casey DE (2001) *J Clin Psychiatry* **62**(Suppl 7): 22–31
American Diabetes Association (2011a) *Diabetes Care* **34**(Suppl 1): S11–61
American Diabetes Association (2011b) *Diabetes Care* **34**(Suppl 1): S75–81
American Diabetes Association; American Psychiatric Association; American Association of Clinical Endocrinologists; North American Association for the Study of Obesity (2004) *Diabetes Care* **27**: 596–601
Arnaud A, Fagot-Campagna A, Reach G et al (2010) *Eur J Public Health* **20**: 601–3

Barnett AH, Dixon AN, Bellary S et al (2006) *Diabetologia* **49**: 2234–46

Bellary S, O'Hare JP, Raymond NT et al (2008) *Lancet* **371**: 1769–76

Berman G (2011) *Prison Population Statistics*. House of Commons Library, London. Available at: <http://bit.ly/qDv84I> (accessed 23.11.11)

Brown C, Leith J, Dickerson F et al (2010) *Psychiatry Res* **177**: 250–4

Chowdhury TA, Lasker SS, Mahfuz R (2006) *Postgrad Med J* **82**: 211–5

Davis TM, Cull CA, Holman RR; UK Prospective Diabetes Study (UKPDS) Group (2001) *Diabetes Care* **24**: 1167–74

de Groot M, Anderson R, Freedland KE et al (2001) *Psychosom Med* **63**: 619–30

De Hert M, Dekker JM, Wood D et al (2009) *Eur Psychiatry* **24**: 412–24

Diabetes Control and Complications Trial Research Group (1994) *J Pediatr* **125**: 177–88

Diabetes UK (2005) *Position Statement. Prisons – Care of People with Diabetes*. Diabetes UK, London. Available at: <http://bit.ly/fV8ueM> (accessed 23.11.11)

Diabetes UK (2006) *Diabetes and the Disadvantaged: Reducing Health Inequalities in the UK. World Diabetes Day 14 November 2006. A report by the All Parliamentary Group for Diabetes and Diabetes UK*. Diabetes UK, London. Available at: <http://bit.ly/uQ5WJi> (accessed 21.11.11)

Diabetes UK (2010) *Diabetes in the UK 2010: Key Statistics on Diabetes*. Diabetes UK, London. Available at: <http://bit.ly/eYhDZK> (accessed 06.12.11)

Dixon L, Weiden P, Delahanty J et al (2000) *Schizophr Bull* **26**: 903–12

Felker B, Yazel JJ, Short D (1996) *Psychiatr Serv* **47**: 1356–63

Fischbacher CM, Hunt S, Alexander L (2004) *J Public Health (Oxf)* **26**: 250–8

Franklin VL, Waller A, Pagliari C, Greene SA (2006) *Diabet Med* **23**: 1332–8

Gask L, Macdonald W, Bower P (2011) *Chronic Illn* **7**: 239–52

Goyder EC, Spiers N, McNally PG et al (1999) *Diabet Med* **16**: 687–91

Gray LJ, Yates T, Davies MJ et al (2011) *PLoS One* **6**: e26464

Helgeson VS, Siminerio L, Escobar O, Becker D (2009) *J Pediatr Psychol* **34**: 254–70

Holmes-Walker DJ, Llewellyn AC, Farrell K (2007) *Diabet Med* **24**: 764–9

Holt RI, Peveler RC (2009) *Diabetes Obes Metab* **11**: 665–79

Hwang SW, Bugeja AL (2000) *CMAJ* **163**: 161–5

Hwang SW, Aubry T, Palepu A et al (2011) *Int J Public Health* Aug 20 [Epub ahead of print]

Kahn LS, Fox CH, Carrington J et al (2009) *Chronic Illn* **5**: 257–67

Khan H, Lasker SS, Chowdhury TA (2008) *Diabet Med* **25**: 1108–11

Kipps S, Bahu T, Ong K et al (2002) *Diabet Med* **19**: 649–54

Koro CE, Fedder DO, L'Italien GJ et al (2002) *BMJ* **325**: 243

Lamberti JS, Crilly JF, Maharaj K et al (2004) *J Clin Psychiatry* **65**: 702–6

Lieberman JA, Stroup TS, McEvoy JP et al (2005) *N Engl J Med* **353**: 1209–23

Lustman PJ, Anderson RJ, Freedland KE et al (2000) *Diabetes Care* **23**: 934–42

MacFarlane IA (1996) *Postgrad Med J* **72**: 214–7

Box 2. Case report.

Narrative

SJ, a 52-year-old man with type 2 diabetes, was recently moved to a high-security prison. Prior to his move, he initiated insulin with support from a hospital specialist team. Following his move, SJ had lost contact with his specialist diabetes team and encountered difficulties in managing his diabetes. The prison mealtimes did not coincide with his insulin regimen and his glycaemic control worsened as he took his insulin several hours after his evening meal and started to experience frequent hypoglycaemic episodes. His request for the prison staff to allow him to have a snack late in the evening was turned down. After repeated requests he was referred to the hospital diabetes team and was seen by a consultant physician and a dietitian. His diabetes treatment was reviewed and his insulin regimen was changed. Prison staff were involved in his diabetes care plan and an agreement was made to allow him to have a bedtime snack. His diabetes control improved and he continued to receive regular input from the hospital diabetes team.

Discussion

Failure of continuity of care is a significant problem among offenders with diabetes and can have a major effect on their diabetes control. Prison staff may not be aware of the specific needs of people with diabetes. Adherence to the prison timetable and usual restrictions on diet may not be suitable for people with diabetes, especially if they are on complex insulin regimens. Occasionally, issues such as manipulation of their diabetes by the prisoners to gain attention (such as missing insulin doses to precipitate hyperglycaemic crises) may lead to further loss of trust between the prison staff and the prisoners. Some of these problems could be avoided by educating the prison staff and ensuring access to specialist diabetes teams on a regular basis.

MacFarlane IA, Gill GV, Masson E, Tucker NH (1992) *BMJ* **304**: 152–5

Mukhopadhyay B, Forouhi NG, Fisher BM et al (2006) *Diabet Med* **23**: 94–8

National Statistics (2011) *Statutory Homelessness: April to June Quarter 2011 England*. Department for Communities and Local Government, London. Available at: <http://bit.ly/v7x1Wo> (accessed 23.11.11)

NHS Information Centre (2011) *National Diabetes Paediatric Audit Report 2009–2010*. NHS Information Centre, London. Available at: <http://bit.ly/p8zK91> (accessed 30.11.11)

Rasmussen B, Dunning P, O'Connell B (2007) *J Clin Nurs* **16**: 17–24

Raymond NT, Varadhan L, Reynold DR et al (2009) *Diabetes Care* **32**: 410–5

Robertson MJ, Cousineau MR (1986) *Am J Public Health* **76**: 561–3

Saxena S, Misra T, Car J et al (2007) *J Ambul Care Manage* **30**: 218–30

Tschoner A, Engl J, Rettenbacher M et al (2009) *Pharmacopsychiatry* **42**: 29–34

Urbach SL, LaFranchi S, Lambert L et al (2005) *Pediatr Diabetes* **6**: 69–74

Viner R (1999) *Arch Dis Child* **81**: 271–5

Viner R (2000) *Hosp Med* **61**: 341–3

Visentin K, Koch T, Kralik D (2006) *J Clin Nurs* **15**: 761–9

Waring T (1996) *Nurs Times* **92**: 38–9

Wild SH, Fischbacher C, Brock A et al (2007) *J Public Health (Oxf)* **29**: 191–8

Online CPD activity

Visit www.diabetesandprimarycare.co.uk/cpd to record your answers and gain a certificate of participation

Participants should read the preceding article before answering the multiple choice questions below. There is ONE correct answer to each question. After submitting your answers online, you will be immediately notified of your score. A pass mark of 70% is required to obtain a certificate of successful participation; however, it is possible to take the test a maximum of three times. Before accessing your certificate, you will be given the opportunity to evaluate the activity and reflect on the module, stating how you will use what you have learned in practice.

- 1. Which of the following antipsychotic medications has the most favourable metabolic effect? Select ONE option only.**
 - A. Risperidone.
 - B. Olanzapine.
 - C. Thioridazine.
 - D. Aripiprazole.
 - E. Clozapine.
- 2. Risk comparison studies between people of south Asian ethnicity and white Europeans have shown that south Asians have which one of the following features? Suggest ONE option only.**
 - A. Increased rates of smoking.
 - B. Higher systolic blood pressures.
 - C. Higher BMI.
 - D. Increased triglycerides and lower HDL-cholesterol.
 - E. Higher levels of physical activity.
- 3. According to published reports, which of the following ethnic groups in the UK has the highest standardised mortality rate? Select ONE option only.**
 - A. Irish.
 - B. South Asian.
 - C. Chinese.
 - D. African-Caribbean.
 - E. African.
- 4. The characteristics frequently associated with adolescents and diabetes are which of the following? Select ONE option only.**
 - A. Peer pressure and risk-taking behaviour.
 - B. Poor attendance at clinics.
 - C. Poor glycaemic control.
 - D. Indifference towards self-management.
 - E. All of the above.
- 5. In which one of the countries in the UK is the care of prisoners with diabetes now a direct responsibility of PCTs? Select ONE option only.**
 - A. Scotland.
 - B. England.
 - C. Wales.
 - D. Northern Ireland.
 - E. None of the above.
- 6. Which one of the following statements regarding prisoners with diabetes is true? Select ONE option only.**
 - A. Prisoners are entitled to specialist diabetes care only if referred by the prison service.
 - B. Prisons have adequate facilities for self-monitoring.
 - C. Self-induced ketoacidosis is common.
 - D. There is a low prevalence of smoking, substance abuse and alcohol-related problems among people in prison.
 - E. All of the above.
- 7. When considering depression in association with diabetes, which of the following statements is NOT true? Select ONE option only.**
 - A. Depression is more common with diabetes.
 - B. The risk of depression increases with complications.
 - C. Treating depression has no impact on glycaemic control.
 - D. There is a QOF requirement to ask about depression in diabetes.
 - E. The risk of depression increases with the duration of diabetes.
- 8. An 18-year-old man with type 1 diabetes is seen in transition adolescent clinic. His attendance to the clinic is poor and his recent HbA_{1c} level is 8.8% (73 mmol/mol). When transfer to adult clinic was discussed, he expressed his wish to remain under the paediatric team. Which one of the following options would be the best care plan for him? Select ONE option only.**
 - A. Convince him that transfer to adult clinic is best.
 - B. Wait until his glycaemic control improves and then transfer to adult clinic.
 - C. Continue to follow-up in transition clinic and transfer to the adult clinic when ready.
 - D. Agree a plan to transfer to adult clinic after 6 months.
 - E. Discuss with his parents and transfer to adult clinic.
- 9. A 45-year-old woman with bipolar disorder and type 2 diabetes is referred for deterioration in glycaemic control and rapid weight gain. She was recently commenced on olanzapine by the mental health team for control of psychotic symptoms. What would be the best course of action for this individual? Select ONE option only.**
 - A. Stop olanzapine.
 - B. Review diabetes treatment and reduce dose of olanzapine.
 - C. Continue same treatment and review in a few weeks.
 - D. Review diabetes treatment and liaise with the mental health team on a regular basis.
 - E. Discharge back to GP and arrange to be reviewed only when mental health symptoms have resolved.
- 10. A 37-year-old homeless man with alcohol and substance misuse problems attends the practice nurse. He has type 2 diabetes and is known to be a rough sleeper in the locality. He has a darkly discoloured great toe and reduced circulation to the same foot. What is the single most appropriate action? Select ONE option only.**
 - A. Prescribe clindamycin.
 - B. Arrange for daily dressings in the surgery.
 - C. Arrange follow-up by the district nurse.
 - D. Arrange urgent admission for revascularisation.
 - E. Arrange urgent outpatient diabetes appointment.