

# Changing diabetes®

## Socioeconomic deprivation and painful neuropathy in type 1 diabetes: Implications for nurse-led screening

*Adrian Heald, Consultant Physician at Leighton and Macclesfield Hospitals; Simon Anderson, Lecturer in Cardiovascular Medicine, University of Manchester; Nagaraj Malipatil, Specialist Registrar, Leighton Hospital and University of Manchester; Hugh Roberts, Emergency Care Administrator, Leighton Hospital, Crewe; George Dunn, Podiatrist, East Cheshire NHS Trust*

There are approximately 250 000 people with type 1 diabetes in the UK (NICE, 2008). Diabetic neuropathy is the most common form of neuropathy in the western world and approximately 50% of people with diabetes have mild to severe forms of neuropathy (Abbott et al, 2011). The majority of these will undergo screening by practice nurses or podiatrists in primary care.

Several distinct forms of neuropathy are associated with diabetes. The most common form of diabetic neuropathy is the distal symmetric sensorimotor neuropathy, which occurs in a glove and stocking pattern and is characterised by symptoms such as burning, shooting pain, tingling sensations and allodynia (pain secondary to a stimulus that does not normally cause pain). However, in many individuals, the neuropathy is insensate (Tsfaye et al, 1996).

Diabetes care provision in the UK is much further ahead than in less developed countries around the world. However, it is clear from several reports that diabetes management is still a significant problem amongst those at a socioeconomic disadvantage (Diabetes UK, 2006). In this current study, we investigated the factors that influence the prevalence of symptomatic diabetic neuropathy in people with type 1 diabetes and analysed the prescribing of agents used to treat painful diabetic neuropathy.

### The study

This study examined pseudo-anonymised records of 1621 people with type 1 diabetes in Cheshire. We included all individuals with type 1 diabetes on our diabetes register in early 2012. Of the 1621 participants sampled, 684 (42.3%) were women. The age range was 16–92 years (mean age 47.6 years).

The Townsend index of deprivation (numerically higher for greater disadvantage) was examined (Townsend et al, 1988). This includes four variables: 1) Unemployment as a percentage of those aged 16 and over who are economically active; 2) Non-car ownership, as a percentage of all households; 3) Non-home ownership as a percentage of all households and 4) Household overcrowding. Positive values of the Townsend Index are associated with geographic areas with high deprivation. Indices with negative values relate to relative affluence.

### Results

Symptomatic neuropathic pain that required pharmacological treatment was present in 280 people and some people required more than one agent. Prescribing was as follows:

- Amitriptyline (dose range 10–50 mg once daily): 46.8% of total prescriptions
- Gabapentin (100–900 mg per day): 26.4%
- Pregabalin (50–300 mg per day): 18.6%
- Carbamazepine (100–800 mg per day): 12.1%;
- Duloxetine (60 mg per day): 9.3%;
- Nortriptyline (10–25 mg once daily): 5.0%;
- Imipramine (10–75 mg daily): 3.9%
- Capsaicin cream (0.025%–0.075%): 2.5%.

In comparison to those without, people with treated neuropathic pain were older (57.1 versus 45.6 years) and had a greater BMI (29.8 kg/m<sup>2</sup> versus 27.8 kg/m<sup>2</sup>). There was no difference in HbA<sub>1c</sub> at 69 mmol/mol (95% CI 66–71; 8.5% [95% CI 8.3%–8.7%]) for treated people versus 68 mmol/mol (95% CI 66–69; 8.4% [95% CI 8.3%–8.5%]) for people not on neuropathic pain-alleviating agents.

Of the 280 people on pharmacologic treatment for painful diabetes neuropathy, 14 were formally diagnosed to have depression or mixed depression and anxiety disorder.

The Townsend Index ranged from -6 to +7; a higher score relating to increased social disadvantage. There were significant differences between the groups for the Townsend Index, with a greater proportion (34.3% versus 21.7%) of people with treated neuropathic pain having a score  $\geq 1$  (indicating greater disadvantage). Importantly, every unit increase in the Townsend Index was independently associated with a 11.5% increased risk of having painful neuropathy to a degree requiring pharmacologic treatment.

### Discussion

We found a significant independent association of social disadvantage, with a greater likelihood of an individual with type 1 diabetes having symptomatic diabetic peripheral neuropathy. This was independent of HbA<sub>1c</sub> and indicates that lifestyle factors play a role in the aetiology of neuropathic

pain, independent of their influence on metabolic control. Both mortality and morbidity in diabetes are increased by socioeconomic deprivation (All Parliamentary Group for Diabetes and Diabetes UK, 2006). This inequality has many causes (Franks et al, 2003).

Amitriptyline was the most common agent prescribed to treat neuropathic pain in our sample of people with type 1 diabetes. NICE guidance (2010) recommends the use of duloxetine as first-line treatment, with amitriptyline to be prescribed if duloxetine is contraindicated. We suspect that the relatively low number of duloxetine prescriptions in our study relates to historical prescriptions being continued, as well as non-adherence with NICE guidance. It is likely that the rate of duloxetine prescribing will increase in the future.

Healthcare professionals working in more deprived areas may be less able to provide comprehensive complication reviews for people with diabetes, due to demands on their time. They may also have less time to fully understand the implications of new research that supports the benefits of intensive management. Furthermore, for the person with diabetes, the understanding of the importance of adhering to what can be a complex preventive strategy, as well as willingness, motivation and the domestic and workplace-related circumstances, may also be adversely affected by low socioeconomic status (Franks et al, 2003).

### NICE recommendations

The NICE guidance (2010) recommends that when selecting pharmacological treatments, clinicians should take into account:

- The person's vulnerability to specific adverse effects because of comorbidities.

- Safety considerations and contraindications, as detailed in the "Summary of product characteristics".
- Preference of the person with diabetes.
- Lifestyle factors (such as occupation).
- Mental health problems (such as depression and/or anxiety).

### Conclusion

Our study has shown that a higher level of socioeconomic deprivation may predispose to severe neuropathic pain in type 1 diabetes. We suggest the targeted allocation of resources, particularly in relation to practice nurse and podiatrist session time. These findings have been presented to local clinical commissioning groups and it is hoped that services will be implemented to address this matter in a constructive fashion ■

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