

PRIORITY BRIEFING

The purpose of this briefing paper is to aid Stakeholders in prioritising topics to be taken further by PenCLAHRC, as the basis for a specific evaluation or implementation project.

QUESTION DETAILS

Question ID: 12

Question type: Implementation

Question: Can early detection of sensory loss in diabetes be improved by standardised use of more sensitive test equipment?

Population: All patients with diabetes who require a diabetes annual review.

Intervention: Currently annual review of the feet of people with diabetes takes place in general practice but there is no standardisation of reliability of equipment, no standard operating procedure and no way of recording which patients have vulnerable feet. Improving the use of enhanced neuroexamination equipment (calibrated monofilaments) and standardised procedures, including a questionnaire for neuropathic symptoms, would allow improved and earlier identification of those at risk.

Control: Usual care varies between general practices, although examination of the feet of people with diabetes is supported by the QOF

Outcome More widespread introduction of better identification would enable better diabetic foot care with consequent health gain and saving of NHS resources. A reduction of the major amputation rate by two thirds (e.g. 30 to 10 cases) may be shown, as already achieved in one health community.

This population also stands to benefit from more intensified management of other diabetes-related risks given the association between neuropathic and other diabetes complications.

Part 1: Research Background

Guidelines:

NSF and NICE guidelines (2004) encourage improvement in systematic identification of those at risk of diabetic foot ulceration.

Research Summary:

An implementation plan is required to take forward the challenge of implementing more sensitive testing for neuropathy and associated standardisation of procedures. Therefore no literature search has been undertaken.

The effectiveness of 6gm (versus 10gm) monofilaments for the detection of sensory sensory neuropathy has been established through research carried out in Torbay.^{1, 2}

Ongoing research:

A 2009 Cochrane Systematic review protocol was located: Complex interventions for preventing diabetic foot ulceration. Dorresteijn J, Kriegsman DMW, Valk GD. The researchers define complex intervention as “an integrated care approach combining two or more prevention strategies on at least two different levels: the patient, the care provider and/or the structure of healthcare.”

The relevance of this research to the topic may be limited, since potential approaches to implementation are not yet clear.

Part 2: Prioritisation Information

1. The health problem

Epidemiology:

Diabetes mellitus is a serious health problem. World-wide prevalence is expected to rise from 2.8% in 2000 to 4.4% in 2030, meaning that 366 million people will be affected. In developed countries worldwide up to 15% of patients with diabetes will at some stage suffer from neuropathic foot ulceration, which can lead to impairment of quality of life, job loss, and limb amputation.

In South Devon Healthcare audits up to end 2008 have confirmed a new ulcer rate of 100 per annum with major amputation rate of 8 to 30 per annum.

The current ulceration rate in diabetes in the district means that over a 15 year period 1,500 or 11% of the peninsula's population are likely to develop new ulcers with the risk of minor or major amputations. This results in significant loss of well being, threat to employment and in the case of major amputation a tangible reduction in life expectancy (75% death rate at 5 years).

Diabetic foot ulceration causes substantial economic burden. Taking healing of ulcers, amputation, loss of productivity, preventive efforts, rehabilitation and home care into account, 7 to 20% of the total expenditure on diabetes in North America and Europe may be attributable to diabetic foot ulceration.

2. Identification of the topic as a priority:

SW SHA Priorities framework 2008-11

Staying healthy, Planned care, Long-term conditions

3. Local perspective

Tractability:

Torbay has a well established approach to diabetic foot care, building on local research showing the greater sensitivity of 6gm monofilaments and a symptom questionnaire for sensory neurological examination. This experience will improve the likelihood of developing and executing effective implementation of improved care in this and other areas.

Extensive expertise and interest across the Peninsula in achieving high quality diabetic care.

An overview of the local context

Good local expertise and support for enhancing community podiatry services.

References

(1) Thomson MP, Potter J, Finch PM, Paisey RB. Threshold for detection of diabetic peripheral sensory neuropathy using a range of research grade monofilaments in persons with Type 2 diabetes mellitus. *Journal of foot and ankle research* 2008; 1(1):9.

ABSTRACT: **AIMS:** To identify the threshold of reduced sensory perception in Type 2 diabetes mellitus (Type 2 DM) using a range of research grade monofilaments. **METHODS:** Three groups of participants were recruited into a between subject, cross-sectional study. Group 1 (NEW), persons with Type 2 DM diagnosed for less than 2 years (n = 80); Group 2 (EST) persons with Type 2 DM diagnosed for more than 2 years (n = 91), and Group 3, a Comparison group without Type 2 DM (n = 73), resulted in a total study population, n = 244. Research grade monofilaments (2, 4, 6, 8 and 10-gram) were employed using standardised protocol, at 6 sites on the plantar aspect of both feet. The demographic and anthropometric measures of gender, age, height, weight, body mass index (BMI), blood pressure and duration of Type 2 DM since diagnosis (if applicable) of the participants were analysed. **RESULTS:** Perception of the research grade monofilaments differed significantly between the 3 groups ($p < 0.05$). The 6-gram monofilament was found to be the threshold of normal perception, based on 90% of the Comparison group perceiving the 6-gram monofilament at all sites in contrast to 64% of NEW and 48% of EST groups. **CONCLUSION:** The 6-gram monofilament was identified as the threshold of normal sensory perception. Inability to perceive the 6-gram monofilament indicates, when using the method described in this study, that diminution of sensory perception is evident. Employing a range of monofilaments, 6, 8 and 10-grams in Type 2 DM foot screening would allow the clinical detection of deteriorating sensory perception and enable implementation of foot protection strategies at an earlier stage than is currently practised.

(2) Paisey RB, Paisey RM, Thomson MP et al. Protection from clinical peripheral sensory neuropathy in alstrom syndrome in contrast to early-onset type 2 diabetes. *Diabetes care* 2009; 32(3):462-4.

OBJECTIVE: Alström syndrome, with type 2 diabetes, and blindness could confer a high risk of foot ulceration. Clinical testing for neuropathy in Alström syndrome and matched young-onset type 2 diabetic subjects was therefore undertaken. **RESEARCH DESIGN AND METHODS:** Fifty-eight subjects with Alström syndrome (18 insulin-resistant nondiabetic and 40 diabetic; aged 8-43 years) and 30 young-onset diabetic subjects (aged 13-35 years) were studied. Neuropathy symptom questionnaires were administered. Graded monofilament and 128-MHz tuning fork vibration perception were assessed in both feet. **RESULTS:** Neuropathic symptoms, loss of monofilament, and/or vibration perception were reported by 12 of the 30 young-onset type 2 diabetic subjects (6 had neuropathic ulceration) but none of the subjects with Alström syndrome. **CONCLUSIONS:** The striking preservation of protective foot sensation in Alström

syndrome may provide a clue to the causes of differential susceptibility to neuropathy in the wider diabetic population