Scottish Government Health Directorates Chief Scientist Office

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FOCUS ON RESEARCH

Remote monitoring of HbA_{1c} using dried blood spot sample collection

Researchers
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Aim
HbA_{1c} is a measure of blood glucose control in diabetes. In Highland, people with diabetes are expected to visit their GP every six months to have a venous blood sample taken and sent to a central laboratory in Inverness for HbA_{1c} analysis. Results are used to assess blood glucose control and to support decision making with their clinician on any lifestyle or medication changes. Recent HbA_{1c} results are often not available when people attend diabetes appointments. This work aimed to: (1) understand the views of people with diabetes on how this issue could be addressed by providing an alternative method of blood sample collection: dried blood spots (DBS) prepared by the patient at home using capillary blood, and (2) assess the performance of DBS in the hands of users, and gather thoughts from users on their experiences and thoughts on using the DBS system.

Project Outline / Methodology
Semi-structured interviews were carried out with participants attending diabetes clinics at Raigmore Hospital, Inverness and Portree Hospital, Skye. Findings were incorporated into the protocol for DBS assessment where participants provided a venous blood sample, and prepared two DBS - one under guidance at clinics and one at home. Home prepared DBS were posted to Raigmore Hospital in Inverness for laboratory analysis. Information about HbA_{1c} was also provided. Participants were asked to complete a questionnaire to gather thoughts on their experience of using the DBS system, thoughts on using a remote HbA_{1c} monitoring service and views on information about the HbA_{1c} that was provided in their home study packs. Blood results were analysed to compare HbA_{1c} measured from venous samples, clinic DBS and home prepared DBS.

Key Results
A strong linear relationship was observed between venous and DBS HbA_{1c} results enabling a linear model to be fitted to the data for prediction of venous HbA_{1c} from home prepared DBS results with clinically acceptable predicition intervals.
Participants indicated that the use of DBS would be an acceptable alternative and that they would be more likely to have their HbA_{1c} test done this way. HbA_{1c} information provided was thought to be interesting and useful.

Conclusions
Use of DBS results for routine monitoring of HbA_{1c} is clincally acceptable.
A DBS approach for routine HbA_{1c} monitoring is acceptable to patients.
The approach presents a learning opportunity for patients on the importance of HbA_{1c} monitoring in diabetes management.

What does this study add to the field?
The study has tested a new method of blood sample collection for HbA_{1c} analysis and captured the views of service users on the apporach.

Implications for Practice or Policy
A DBS approach will increase service user participation in routine HbA_{1c} monitoring helping to minimise the longterm complications of diabets through improvements in diabetes management.

Where to next?
We aim to carry out a consultation across primary and secondary care with the aim of identifying the most effective way of integrating a DBS approach into routine practice.
We also plan to carry out a health economics assessment.

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