

Initial evaluation of the Telcare BGM

Introduction

Connect Health Solutions UK (CHS) are proud to bring to the UK market the Telcare BGM as the world's first cellular connected blood glucose meter (www.connecthealthsolutionsuk.com).

The meter automatically transmits recorded blood glucose data automatically to a central database. You simply test your blood glucose and the meter does the rest. It gives you the result with some instant feedback and then automatically uploads the results to the tracking software online. While there are glucose meters that allow you to download your glucose data wirelessly, there are no meters that do this using cellular technology. Even when you are traveling, your glucose test results get transferred to your online record automatically. The online recorded data can be viewed by patients and can be shared with their healthcare professionals. Access to the online portal is easy and accessible anywhere patients or their healthcare team have an internet connected device. Permissioned healthcare professionals cannot only view but also comment on individual patient results – communicating via the Telcare BGM. In May 2012, Telcare added a mobile application that is both PC and MAC compatible. Using the Telcare BGM individuals can now synch their results with a smartphone allowing the tracking and manipulation of their glucose data.



Evaluation

The Telcare BGM was evaluated at the Ulster Hospital starting in December 2014 initially in women with diabetes who were pregnant. Approximately 400 patients per year are treated in the diabetes and pregnancy service. They require very frequent interactions with healthcare professionals - often fortnightly or weekly - and this puts pressure on healthcare resources. Patients are asked to check their capillary blood glucose (CBG) levels at least 7 times per day and to attend the clinic every 2 weeks with 1-2 telephone calls between clinic visits to advise on treatment. These are high risk pregnancies which require very careful monitoring and treatment from a highly specialised team.

The aim of this initial evaluation was to check the technology would work in our healthcare environment (NHS, UK) and to develop both clinician and patient experience with the device and portal while maintaining a high standard of care for those with high risk pregnancies.

The Telcare BGM solution was used in 10 patients with diabetes in pregnancy. Four patients had a previous history of gestational diabetes, 5 patients had gestational diabetes diagnosed in this pregnancy and 1 patient had type 1 diabetes.

Evaluation Outcomes

From a technical standpoint the device and solution performed well. The device was easy to use and data transfer to the on-line database occurred seamlessly. Clinicians had no problems integrating the approach into their workflows. Not all the functionality available was used optimally. The alerting, notification and communication capabilities embedded in the system are sophisticated and would need evaluated further.

Eight patients (80%) continued to use the device for the duration of their pregnancy. One patient (with newly diagnosed gestational diabetes) stopped using the device after two weeks due to an unsettling (for the patient) discrepancy between the Telcare BGM and previous meter readings. One patient (with a previous history of gestational diabetes) stopped using the device after five weeks as she transferred her care to another hospital team.

In the patient with type 1 diabetes, hospital visits were reduced from 2 weekly to 4 weekly thereby saving approximately 8 hospital clinic appointments but with increased interaction with the diabetes and pregnancy team via telephone after CBG review using the online portal.

Three of the patients with a previous history of gestational diabetes were subsequently diagnosed with gestational diabetes in this pregnancy and were commenced on insulin therapy. Rather than contacting the diabetes team every 3-4 days via telephone, the Telcare meter allowed us to monitor remotely and only make contact with the patient if insulin doses required titration. All of these patients had been on insulin therapy during a previous pregnancy with gestational diabetes and found this method of interaction much more convenient.

Those with a new diagnosis of gestational diabetes in this pregnancy found the meter easy to use with no additional time required to teach the device compared to our standard meters.

The clinical staff found that the device was easy to teach to individual patients and appeared robust. The display was visually appealing. The facility to 'tag' a CBG to a particular mealtime is especially beneficial in pregnancy and this is lacking in other tele monitoring solutions. The online portal was easy to access and data is clearly displayed in a meaningful manner. This allowed rapid but careful interpretation of blood glucose readings to see whether specific patient interaction was required at that time. The facility to message the patient through the Telcare BGM was not used consistently on this occasion but this was seen by healthcare professionals as likely to be beneficial for future usage.

The only technical downside we observed during the pilot was the requirement to charge the device on a daily basis and on a few occasions this resulted in patients not being able to easily check their fasting glucose (if they had forgotten to charge overnight).

With expanded usage we can see a number of advantages both for the service and for individual patients. Firstly, in those with previous gestational diabetes, they will not need to attend the diabetes and pregnancy clinic after their first visit unless their CBG monitoring shows evidence of gestational diabetes. This will save a great number of hospital appointments. Secondly, in those patients on insulin in pregnancy (for any indication) we can remotely monitor their CBG and be very proactive in giving advice for insulin adjustment rather than relying on the patient to make contact. Visit frequency may also be reduced but this needs tested. We also can envisage potential for usage within our general diabetes clinics.

Summary

In summary, both patients and clinicians found the device and on-line portal easy and beneficial to use. Using this device in the entire diabetes & pregnancy clinic is likely to ease pressure on a very busy service and improve the overall patient experience.

Conclusions

Our small initial evaluation has provided enough information for us to conclude that the Telcare BGM solution:

- Is easy to use and works as designed
- It promotes patient engagement (80% +)
- It has the potential to reduce the need for frequent face-to-face visits in our use case but protected time will be needed for healthcare providers to perform telemedicine reviews
- The on-line portal gives a clear and 'easy to interpret' picture of a patient's glycaemic status
- It has the potential to encourage a more productive and collaborative partnership between patients and healthcare professional

Recommendations

1. We would strongly support the inclusion of the Telcare BGM in the NHS Drug Tariff in order for diabetes teams and their patients' to access this potentially transformative solution.
2. We would strongly advocate this solution in preference to Northern Ireland's current remote tele monitoring service (known as RT-NI).
3. Further large scale deployment with ongoing evaluation is warranted. A local university is interested in further examining how telemedicine solutions (such as

Telcare BGM) can help meet the growing demand on diabetes and pregnancy services due to the increasing number of women being diagnosed with gestational diabetes (Given et al, 2015).

Acknowledgements

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References

Tele-Mum: A Feasibility Study for a Randomised Controlled Trial Exploring the Potential for Telemedicine in the Diabetes Care of Those with Gestational Diabetes. Given JE, Bunting BP, O’Kane MJ, Dunne F, Coates VE. Diabetes Technology and Therapeutics. December 2015, 17(12): 880-888. Doi:10.1089/dia.2015.0147

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