Efficacy of use of Continuous Glucose Monitoring System in patients with Congenital Hyperinsulinism

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ESPE 2021
The 59th Annual Meeting Online
22-26 September 2021

NHS Great Ormond Street Hospital for Children NHS Foundation Trust

INTRODUCTION

- In Congenital Hyperinsulinism (CHI), hypoglycaemic episodes, particularly the asymptomatic ones, are not always detected due to the intermittent measurement of blood glucose concentrations.
- Detecting and treating these episodes is important for prevention of hypoglycaemic brain injury.
- Continuous Glucose Monitoring System (CGMS) is widely used in adults and children with diabetes, however the use in patients with CHI remains limited.

AIM

To determine whether children with CHI can have an effective glycaemic control with the use of CGMS.

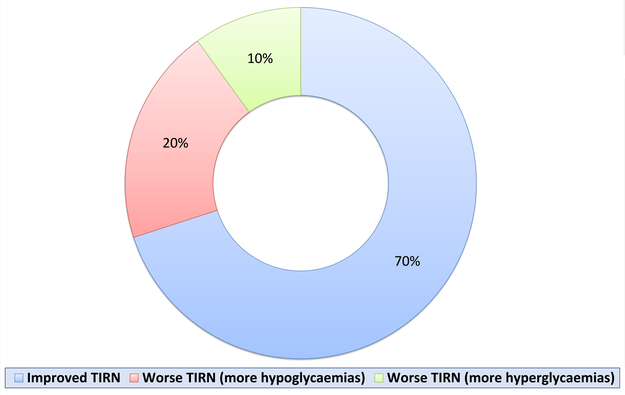
METHOD

- Retrospective study over 12 weeks.
- **Cohort**
  10 patients with CHI, with a mean age of 7.2 years (range 2.1 - 16.07) using a Dexcom G6 real time CGMS (rtCGMS)
- **Efficacy outcomes measured**
  - Time in range in normoglycaemia (TIRN) - blood glucose (BG) 3.9 to 10 mmol/L.
  - Number of hypoglycaemia episodes (BG <3.9 mmol/L) per week
  - Time in low (BG <3.9 mmol/l), and very low (BG <3.0 mmol/L))
  - Time in high (BG>10.0 mmol/L) and very high (BG >13.9 mmol/l)
- All parameters were assessed at four and twelve weeks from insertion of CGMS.

RESULTS

- At 4 weeks on CGMS, the TIRN of the cohort ranged between 68.8 and 98.6%.
- After 12 weeks of using CGM, 70% of our cohort (7/10) showed improved TIRN by 0.2 -2.8%

Changes in time in range in normoglycamia (TIRN) in our patients after 12 weeks



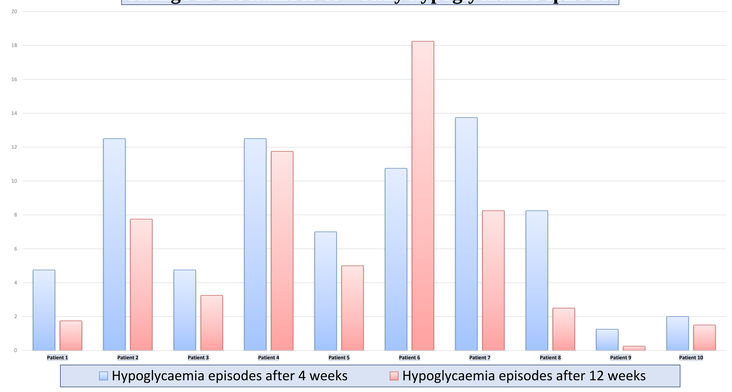
Hypoglycaemia

- 60% of the patients (6/10) had an improvement of the time in hypoglycaemia (between 0.1 and 1.7%), while 3 patients had an increase (between 1.1 and 2%), in the time in hypoglycaemia and 1 remained the same.
- 50% of the participants (5/10) had a reduction of the time in very low hypoglycaemia (between 0.1 and 0.2%), with 3 patients showing increase (between 0.2 and 1.7%), and 2 remaining unchanged.

Hyperglycaemia

- In 50% of the patients (5/10) there was a decrease of time in hyperglycaemia (between 0.1 to 4.2%). In 4 patients an increase was noted (between 0.6 to 4.9%) whereas in 1 patient there was no change.
- 20% of our cohort (2/10) showed a decline of the time in very high hyperglycaemia (0.1%), with 2 patients showing a rise (between 0.2 to 4.4%) and 6 remaining unchanged .

Change in the number of weekly hypoglycaemia episodes



90% of our patients (9/10) had a lower number of weekly hypoglycaemic episodes, with only one case of increase. There was an average decrease between 0.5 to 5.75 hypoglycaemia episodes per week.

CONCLUSIONS

After 12 weeks of use of Dexcom G6 rtCGMS in patients with CHI at our centre, we noticed an **improvement of TIRN and a decrease in number of weekly hypoglycaemic episodes**.
Therefore, CGMS can assist CHI patients and families with more effective glycaemic control.
This way, we may avoid hypoglycaemic brain injury and optimize treatment.
Further studies are needed to assess the potential of CGMS as a decision-making tool in hypoglycaemia management in the CHI cohort.

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ACKNOWLEDGEMENTS

Patients and Families.
Patients' Consultants Paediatricians who supported the IFR applications for CGM funding.
The National COVID-19 monies from the specialised commissioning Senior Management Team NHS England.

CONTACT INFORMATION

Website: https://www.gosh.nhs.uk/wards-and-departments/departments/clinical-specialties/endocrinology-information-parents-and-visitors/conditions-we-treat/congenital-hyperinsulinism-chi/