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Implementation of continuous glucose monitoring in a humanitarian setting

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Introduction

The management of diabetes in children in refugee settings brings challenges, including glucose monitoring, upon which adaptation of insulin treatment depends. Continuous glucose monitoring (CGM) provides information on glucose trend variations and relieves patients from frequent finger pricking by automatically measuring and storing glucose levels. CGM has been adopted in resource-rich settings, but experience on its use in refugee settings is lacking. In 2019, MSF implemented CGM for Syrian refugee children living with type 1 diabetes who receive medical care at MSF clinics in Bekaa valley and Tripoli, Lebanon. In a retrospective descriptive study, we aimed to assess the feasibility of CGM use in this setting and whether its use would improve with time.

Methods

Children <17 years old, treated for type 1 diabetes in six MSF clinics where NCD care is provided, were eligible for CGM using Freestyle Libre (Abbott). Patients were given a sensor to insert and wear for 2 weeks each month, which they were required to scan every 8 hours for data capture. They resumed finger prick testing for the rest of the month to minimise cost. We analysed sensor data from the first 12 weeks of CGM patient use, using Excel and Stata 15.1. We compared the proportions of data captured, including readings within target range (70-180 mg/dL), and the frequency and duration of low glucose events (LGE; <70 mg/dL) in the first 2 weeks versus the last 2 weeks of implementation.

Ethics

This pilot implementation study of a tool in wide use in resource-rich settings used data routinely collected for clinical care and was exempted from review by the MSF Ethics Review Board by Monica Rull, Medical Director, Operational Centre Geneva, MSF.

Results

62 children were progressively included in CGM from April, 2019; by December, 2019, 27 children had completed 12 weeks of CGM. Median age was 11.5 years; 30 (48%) were female. Mean (SD) Hba1c was 9.4% (±1.9) in the 52 (84%) children in whom it was measured 46 (±34) days before CGM initiation. The mean proportion of captured sensor data increased from 78.5% (±21.8) in weeks 1-2 to 87.7% (±13.2) in weeks 11-12. Mean LGEs per patient decreased from 11.1 (95%CI 9.1-13.1; n=62) in week 1-2 to 8.3 (5.4-11.2; n=27) in week 11-12. The mean average duration of LGEs decreased from 124.6 (109.7-139.5; n=62) to 103.5 minutes (79.1-127.9; n=27). The mean proportion of glucose readings within target range decreased from 31.3% (27.9-34.8; n=62) to 27.9% (22-33.8; n=27). One patient reported pain and stopped CGM.

Conclusion

CGM use improved over time; however, the decrease in the proportion of within-range sensor data should be explored. The study is limited by the absence of targets for the variables, meaning that comparisons were only temporal, and the small number of patients who had completed 12 weeks of sensor use. Next steps should include an analysis of the impact of prolonged CGM use on patient

outcomes. Patient and provider satisfaction and perceptions on challenges and benefits of using this tool in refugee settings should also be explored.

Conflicts of interest

None declared.