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DIABETIC Medicine

LETTER

The impact of diabetes specialist nurses' in-reach service on people with diabetes on haemodialysis: A pilot study 'education to protect tomorrow'

People on haemodialysis (HD) with diabetes and chronic kidney disease are disadvantaged by intrusive dialysis therapy 3 times a week, rendering their attendances to other services difficult. In our population of 225 people with diabetes on HD in 3 North West London dialysis units, only 80 were under specialist diabetes service. Focusing on one of the three dialysis centres, a random sample of 10 people who were transplant wait-listed but not in specialist diabetes care were treated in this study. We conducted a quality improvement project, Education to Protect Tomorrow (E2PT), by providing diabetes specialist nurses (DSN) in-reach service to the dialysis centre. We evaluated their glycaemic control and participants' knowledge of diabetes before and at the end of E2PT. Intermittently scanned continuous glucose monitoring (isCGM) using Freestyle Libre 2 was initiated during the participants' dialysis sessions by the DSN and continued for the duration of E2PT. Review of the isCGM data and diabetes treatment regime, education on self-management of diabetes including hypoglycaemia and sick day rule, individualised diet and lifestyle advice were provided during the weekly point of contact on the dialysis unit (Figure 1).

Glycaemic variability measures (GV) at baseline and a 16-week endpoint were analysed for isCGM, in the sampling window of 14 days before the start and 14 days before the end of E2PT. Measures of GV were computed using EasyGV (v10.0) software.[1] Nonparametric tests (Wilcoxon-matched pairs signed rank) were used. Data are expressed as medians (interquartile ranges, IQRs). Participants' knowledge of diabetes was evaluated using the Diabetes Knowledge Questionnaire (DKQ) before and after E2PT. DKQ is a validated questionnaire designed to elicit information about a person's understanding of the cause of their disease, its associated complications, blood glucose levels, diet, and physical activity.[2] Average age was 60 (range 51–67), 8 males: 2 females, baseline HbA1c was 50.2 mol/mol and fructosamine 412 mmol/L. Percentage time in range (3.9–10.0 mmol/L) was significantly improved from baseline (46.1 [30.5–91.3]%) to endpoint (63.3 [60.6–95.3]%; $p = 0.013$). There was a significant reduction in time above range (>10.0 mmol/L) from baseline (47.3 [3.4–68.5]%), compared with endpoint (35.9% [1.0–38.9]; $p = 0.022$). Mean glucose was also significantly lower at the endpoint compared to baseline (9.2 [6.5–9.5] mmol/L vs. 9.9 [6.9–12.7]; $p = 0.037$). There were no significant differences in hypoglycaemia (<3.9 mmol/L; $p = 0.919$) and GV measures (coefficient of variation [CV] and mean absolute glucose [MAG]) with E2PT. E2PT also led to improvement in participants' knowledge of diabetes. The median DKQ scores increased from 58% (IQR 26–85) to 95% (IQR 90–100; $p = 0.001$).

In this study, diabetes in-reach service to people attending dialysis sessions, combined with the use of isCGM, is associated with an improvement in time in range after 16 weeks without significant change in hypoglycaemia. The in-reach service to dialysis unit improved the coordination of care and allowed the engagement of people on HD with the diabetes team. DSN's feedback highlighted that an effective team-based approach encouraged people with diabetes and CKD to make lifestyle and behavioural modifications and that people required continual motivation to change their behaviour in self-glucose monitoring using isCGM, diet and lifestyle modifications. E2PT was demonstrated to be an effective means to motivate these participants and promote self-care in their diabetes management. Moreover, it also increased dialysis staff awareness about isCGM, allowing them to further prompt participants in contact during dialysis sessions to assess their glucose levels in centre and at home.

For people with diabetes and CKD, HbA1c has pitfalls that limit its accuracy as the biomarker of long-term glycaemic control.[3] isCGM has been shown to be a reliable tool for glucose monitoring in adults on HD[4] and is also useful to improve glycaemic control.[5] For 2 participants in this study, E2PT participation and isCGM initiation alone were sufficient to improve their glycaemic control. In the other 8 participants: oral diabetes medication adjustments were needed in 4 of them (including stopping/starting Linagliptin and Gliclazide), and insulin was initiated and titrated in the remaining 4.

The purpose of the DKQ is to assess the effect of our E2PT diabetes education intervention on knowledge

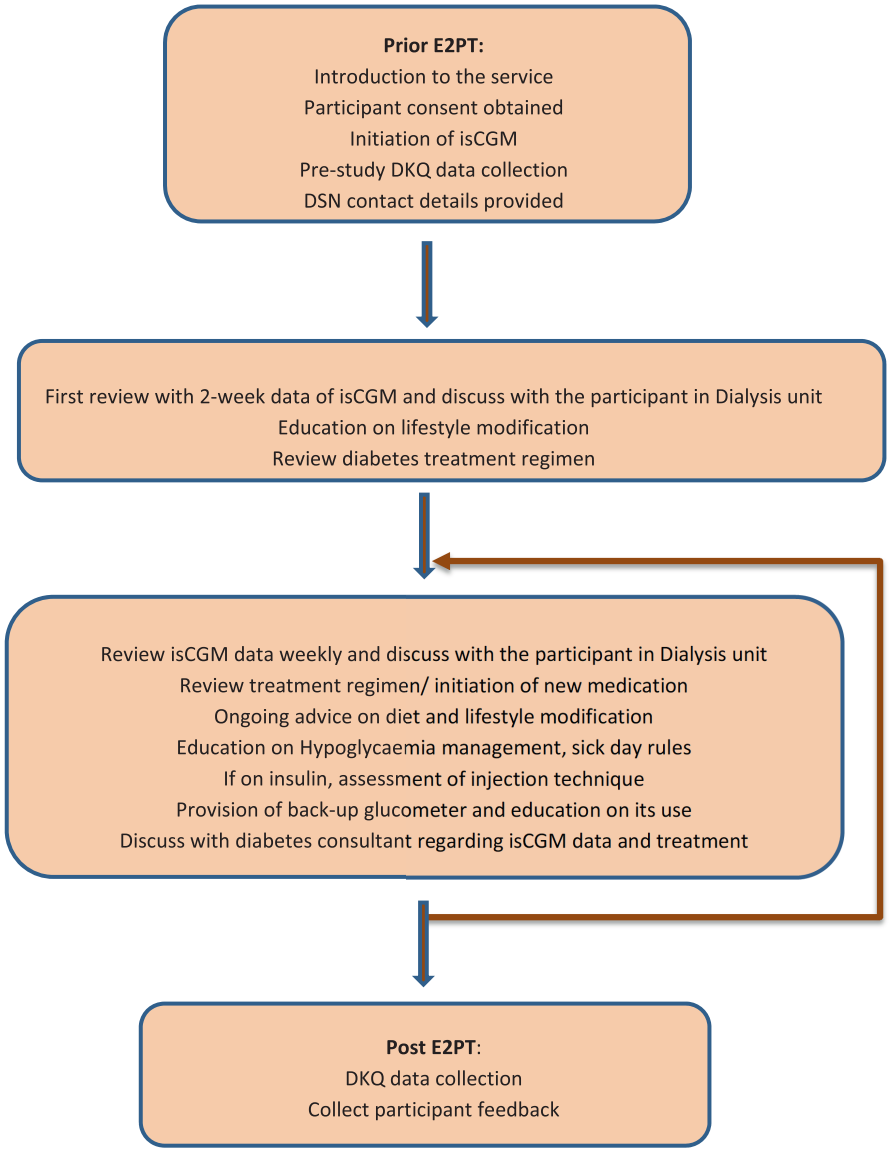

FIGURE 1 Education to Protect Tomorrow (E2PT) provides diabetes in-reach service to the dialysis unit.

of diabetes and its self-management requirements in people with diabetes. This DKQ was used as it was developed and validated specifically to assess diabetes education interventions. Points were given to correct answers and some questions had more than one answer. The more correct answers, the higher the score to the question topics. The DKQ was only successfully completed with the DSN's assistance in all participants. This emphasises that the process was formative in identifying lack of knowledge. The DKQ helped to bring individualised focus to subsequent E2PT in weekly sessions to improve diabetes knowledge which linked to diabetes self-care and glycaemic control. E2PT has dual benefits of glycaemic optimisation prior to transplant and made people aware of the importance of education for self-management post-transplant when immunosuppressants may affect glucose.

The need for intensive continual personalised motivation to each person to achieve sustained improvement in glycaemic control can be a challenge to implement E2PT for a larger cohort. Nonetheless, the structured approach and effectiveness of the in-reach service would make up-scaling achievable.

In conclusion, an individualised, collaborative care approach improved glycaemic control and knowledge of diabetes in people on haemodialysis.

CONFLICT OF INTEREST STATEMENT

No conflicts of interest are declared by the authors.

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