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A new integrated care pathway for ambulance attended severe hypoglycaemia in the East of England: The Eastern Academic Health Science Network (EAHSN) model

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ABSTRACT

Aims: We developed a new clinical integrated pathway linking a regional Ambulance Trust with a severe hypoglycaemia (SH) prevention team. We present clinical data from the first 2000 emergency calls taken through this new clinical pathway in the East of England.
Methods: SH patients attended by Ambulance crew receive written information on SH avoidance, and are contacted for further education through a new regional SH prevention team. All patients are contacted unless they actively decline.
Results: Median age (IQR) was 67 (50–80) years, 23.6% of calls were for patients over 80 years old, and patients more than 90 years old were more common than 20–25 year olds in this population. Most calls were for patients (84.9%) who were insulin treated, even those over 80 years (75%). One - third of patients attended after a call were unconscious on attendance. 5.6% of patients in this call population had 3 or more ambulance call outs, and they generated 17.6% of all calls. In total, 728 episodes (36.4%) were repeat calls. Insulin related events were clinically more severe than oral hypoglycaemic related events. Patients

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Emergency conveyed to hospitals (13.8%) were significantly older, with poorer recovery in biochemical hypoglycaemia after ambulance crew attendance. Only 19 (1%) opted out of further contact. Patients were contacted by the SH prevention team after a median 3 (0–6) days. The most common patient self - reported cause for their SH episode was related to perceived errors in insulin management (31.4%).

Conclusions: This new clinical service is simple, acceptable to patients, and a translatable model for prevention of recurrent SH in this largely elderly insulin treated SH population.

1. Introduction

Severe hypoglycaemia (SH), defined as an episode severe enough to require external assistance in treatment and recovery, is a frequent and distressing experience for people with diabetes, and is due to insulin therapy or to some oral hypoglycaemics [1,2]. The significant direct and indirect costs related to ambulance attendance, hospital transfers and admissions, and lost productivity due to SH, are well described [2–4]. The impact of SH on quality of life, the fear of hypoglycaemia, and a determination to avoid SH often influences efforts to reach reasonable glycaemic targets [5,6].

More than 90% of the UK diabetes population have Type 2 diabetes, and recent large meta-analysis of hypoglycaemia outcomes in Type 2 diabetes [7], estimated that insulin treated Type 2 diabetes patients experience a mean of 1.05 (95% CI 0.0–3.69) SH episodes per annum. The equivalent data for sulphonylurea treated patients and SH was 0.01 (95% CI 0–0.55). Elderly patients with insulin treated Type 2 diabetes and co-morbidities such as cognitive impairment, dementia, or renal impairment are more likely to experience SH [8–10], and have higher mortality and morbidity following SH [11,12]. Robust glycaemic targets in diabetes management guidelines, or in UK primary care diabetes quality frameworks, do not give enough weight to the risk of SH in the frail elderly, or promote clinically sensible targets relevant to the frail elderly [13,14].

Ambulance Trusts are the main provider in the UK of first contact emergency medical services for people experiencing SH, and may be attending up to 100,000 emergency calls for SH episodes per annum [15]. Effective management of SH is one of the key performance indicators for UK Ambulance Trusts (16) and they operate effective 'see and treat' policies for SH, where Ambulance Crew manage the episode at the scene, with few patients carried onwards to a local emergency department or admitted [17,18]. The weakness of this model is that SH patients managed successfully by Ambulance Crew do not then receive any additional education triggered by the SH event, and the patient's normal primary or secondary care diabetes team often remain unaware of these episodes. In one large UK population more than half of ambulance attended SH patients either declined further treatment or were only advised to seek further advice at their discretion [18]. This is important, as many patients with SH make multiple calls about SH to emergency services, describe multiple previous SH episodes, and have had little advice or education on SH avoidance. The risk of further SH episodes can be reduced with enhanced diabetes education and support [1,2,8,17–19]. Many patients are also reluctant to identify themselves as having had an SH episode, as they understand the risk to then holding a driving license [6].

We developed a regional integrated SH management team for a population of 4.4 million in the East of England based around a single point of contact (SPOC) model between Ambulance Trust and primary and secondary care, with an associated mass SH education programme for patients and health care teams. We describe this model, and the first 2000 SH episodes we have taken through this pathway.

2. Methods

The East of England Ambulance Trust (EEAAT; www.eastamb.nhs.uk) provides emergency services to a population of 5.8 million in the East of England. The Ambulance service covers an area of 7500 square miles, supports 17 Acute Trusts and 19 primary care Clinical Commissioning Groups (CCG) covering the counties of Norfolk, Suffolk, Cambridgeshire, Bedfordshire, Hertfordshire, and Essex. The Eastern Academic Health Science Network (EAHSN; www.eahsn.org) is one of 15 academic health science networks in England, established by NHS England in 2013 to spread innovative services at scale and pace and connect academic and NHS organisations and local authorities to improve outcomes, and variance in outcomes, for patients. The EAHSN covers a population of 4.45 million within the EEAAT area, with an estimated 271,000 people, and an average adult diabetes prevalence of 6.1% [20]. In 2014, before the current programme commenced, this Ambulance Trust recorded 9374 emergency calls to people with a primary diagnosis of diabetes, overwhelmingly due to severe hypoglycaemia, an estimated 80% being SH; as elsewhere in the UK, there was no structured pathway to provide further care for these patients, or to identify causes of SH, or to link these recorded incidents with the patients existing primary or secondary care team. We developed a regional collaborative group of diabetes specialists from primary and secondary care, and secured significant funding from the EAHSN to develop a new pathway with the East of England Ambulance Trust to improve outcomes for SH patients. We developed a single point of contact model (SPOC) where Ambulance Crew attending an SH emergency, call through the patient details to the SPOC office after appropriate SH treatment. Attending Ambulance Crew also give every attended patient written information on SH avoidance, causes of SH and driving license implications (see supplementary