Original Article

Assessment of inpatient diabetes knowledge among healthcare professionals in a district general hospital

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ABSTRACT

Aims: Diabetes mellitus is a commonly encountered diagnosis in hospitalised patients that is associated with prolonged admissions and mortality. One in six hospital beds in the UK are occupied by diabetes patients. Therefore, healthcare providers need to have a sound knowledge in managing in-patients with diabetes. Thus the aim of this clinical survey was to assess the diabetes-related knowledge of healthcare professionals in a district general hospital.
Methods: A 24-item questionnaire, based on the 'Think Check Act (TCA)' diabetes modules implemented by the Healthcare Improvement Scotland was issued to the medical and nursing staff. Simple statistics were used for data collation and analysis.
Results: 30 questionnaires were completed by 10 doctors at varying stages of training, 17 nurses, 1 physician associate and 2 healthcare assistants. The mean percentage score of the participants were 57.4%. 22 (73.3%) correctly defined hypoglycaemia and 27 (90%) knew the location of hypo box and 7 (23.3%) were aware of TCA. Responses to other management related to diabetes emergencies were average. The responses between doctors and nurses were insignificant except for hypo box location ($p = 0.0413$).
Conclusion: Knowledge about managing inpatient diabetes problems amongst healthcare professional at a district general hospital appears mediocre. Significant gaps have been identified which would be targeted for future educational events.

1. Introduction

Diabetes has become a major public health problem with prevalence expected to rise to 300 million by 2025 [1,2]. In the UK 1 in 6 hospital beds are occupied by someone with diabetes and a significant proportion of these patients have suffered hypoglycaemia or Diabetes Ketoacidosis (DKA) [3]. Poorly controlled diabetes is associated with poor clinical outcomes. It leads to increased risk of infections, length of stay and higher morbidity and mortality [1,4,5]. National Health Service (NHS) Scotland spends almost £1bn annually or £100,000 every hour on diabetes [6]. Despite this, there is evidence that inpatient diabetes care is poor in many areas and the 2010 National Diabetes Inpatient Audit (NaDIA) highlighted it as a cause for concern [7].

Good standards of care of inpatient diabetes are a priority in organisations; the involvement of the multidisciplinary team (MDT) is pivotal in providing a safe, effective and evidence based care [3]. However studies have shown a general lack of knowledge amongst healthcare professionals regarding inpatient diabetes management [5,8–13]. Patient satisfaction with the level of staff awareness and knowledge of diabetes varied by over 75% [3]. In addition to factors such as miscommunication among the healthcare professionals, mistakes in dispensing, and failure of safety systems, insufficient knowledge about insulin and diabetes management contributes to errors in insulin management [11].

Trainee doctors and nurses are involved in the provision of primary medical care to these patients and therefore, they should be well-equipped to deal with this epidemic effectively [12,14]. However healthcare professionals work under immense pressure preventing staff access to training on offer and additionally, pre-registration training doesn't always support a sound knowledge in dealing with diabetes [3].

The healthcare improvement for Scotland has established a

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Table 1
Responses to basic diabetes related questions.

Question item	Doctors (n = 10)	Staff nurse (n = 17)	PA+ (n = 1)	HCA+ (n = 2)	Total number of correct response (n = 30)	p-value[a]
Desirable BG+ (6—12 mmol/L)	3 (30%)	3 (27.6%)	1 (100%)	1 (50%)	8 (26.7%)	0.6382
Hypoglycaemia definition (<4 mmol/L)	6 (60%)	13 (76.5%)	1 (100%)	2 (100%)	22 (73.3%)	0.4147
Hypo Box location	7 (70%)	17 (100%)	1 (100%)	2 (100%)	27 (90%)	0.0413
Usual insulin concentration (100units/mL+)	6 (60%)	14 (82.4%)	0	1 (50%)	21 (70%)	0.3648
IV insulin half-life (5 min)	3 (30%)	9 (52.9%)	0	0	12 (40%)	0.4244

+ PA = physician associate; HCA = healthcare assistant; BG = blood glucose; mL = millilitre.
[a] Fisher's exact test was used to compare the proportion of responders between doctors and staff nurse.

nationwide training toolkit to improve the quality of care for patients with a secondary diagnosis of diabetes. The Think Check Act (TCA) online e-learning modules are designed to help Diabetes specialists and non-specialist staff to improve the processes, communication and education surrounding inpatient care for people with diabetes in acute hospitals [6]. It consists of five modules and Check Protect Refer (CPR) for foot covering key aspects of clinical care. Each module takes between 10 and 20 min to complete and can be revisited periodically.

The aim of this focused clinical survey was to assess the diabetes-related knowledge of healthcare professionals in a district general hospital.

2. Methods

A cross-sectional single centre self-administered questionnaire survey was performed to collect data on diabetes related knowledge. The participants included doctors at various levels of training, physician associates (PA), staff nurses and healthcare assistants (HCA) working in emergency, acute stroke and general medical wards at Dr Gray's hospital. It is a district general hospital (DGH) situated in north of Scotland, serving the county of Morayshire with 185 inpatient bed [15].

The authors developed a 24-ithem questionnaire based on the TCA modules. It was reviewed by the lead specialist consultant in diabetes before enrolling into the survey. There were six 'Yes or No' and 18 multiple choice questions [see appendix A]. It assessed knowledge on basic demographics of diabetes, management of inpatient diabetes related issues. The questionnaire was distributed directly to staff across a period of two weeks. Doctors and physician associates were approached mainly in the morning post handover meetings or during lunch break. Staff nurses and HCA were approached in their designated wards at random shift, either in the morning or early evening. Staff were actively encouraged to be involved although participation was voluntary and all responses were completely anonymous. It took about 10—15 min to complete the questionnaire. Ambiguous answers and partially completed surveys were considered incorrect. Statistical significance between doctors and nurses were obtained using the Fisher's exact test.

3. Results

A total of 30 completed questionnaires were returned by 10 (33.3%) doctors, 17 (56.7%) staff nurses, one (3.3%) physician associate and two (6.7%) healthcare assistants. Of the 10 doctors, two were consultants, four senior house officers and four foundation year one doctors.

The questionnaire was scored out of a total of 39; the overall average score of the study subjects were 22.39/39 (57.4%). Staff nurses scored the best average of the group with 69.5% (27.12/39) followed by doctors, 60.0% (23.42/39), HCA 53.8% (21/39) and PA 46.2% (18/39).

Only 7/30 (23.3%) have heard of the healthcare improvement for Scotland's initiative of 'Thick Check Act and CPR for foot' however 30/30 (100%) agreed that patients should be involved in diabetes management at hospital. The proportion of diabetes in hospitals as 20% and the proportion of those suffering from hypoglycaemia as 1 in 4 was correctly chosen by 5/30 (16.7%) and 8/30 (26.7%) respectively. 76.7% (23/30) of the participants identified all the hypoglycaemic symptoms; eight doctors, 13 staff nurses, one PA and one HCA. Table 1 represents responses to multiple choice questions with single best answers that address some basic knowledge on inpatient diabetes management. There was a statistically significant difference between doctors and nurses in response to hypo box location with p = 0.0413. Fig. 1 illustrates participant response to treatment and management of patients with diabetes in hospital.
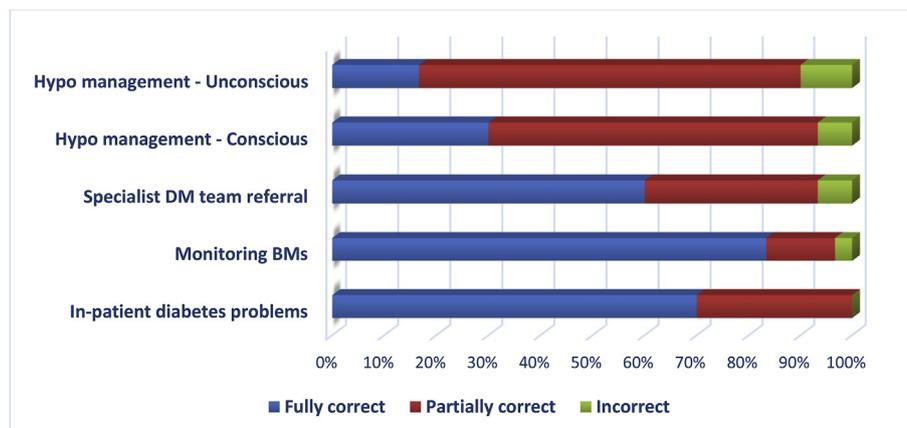

Fig. 1. In-patient diabetes management.

4. Discussion

This survey assessed the inpatient diabetes related knowledge amongst healthcare professionals at a DGH. It included the main departments and staff from all grades that are primarily involved in the provision of care to hospitalised diabetes patients. The overall score of 57.4% of correctly answered questions demonstrates that the knowledge about inpatients diabetes care is mediocre in our hospital. This appears to be similar to some of the other published findings including United Kingdom (UK) studies on trainee doctors and nurses [4,14,16].

Even though TCA and CPR for foot is national quality improvement initiate by health care improvement for Scotland, only 23.3% of our staff were aware of it. This might due to the lack of extensive diabetes specialist involvement at staff level, in a DGH as oppose to large tertiary care centres. Additionally NHS staff might be under immense work pressures and short-staffed to be able to review the learning resources offered [5].

The deficiency in specific management related to inpatient diabetes is evident in staff response to the survey. Only 73.3% of our staff recognized the correct hypoglycaemia cut off of <4 mmol/L. Doctors (60%) were more incapable of identifying it compared to the nurses (76.5%). In a large study from the UK assessing diabetes knowledge on trainee doctors, they found that only 55% were able to confidently identify and manage hypoglycaemia [14]. Another study reported 51.8% nurses recognized hypoglycaemia level [13] but it is still inferior to a UK study that found 90% accurate response [5]. This is significant as often nursing staff are the first point of contact for diabetes patients in hospitals and under-recognition of hypoglycaemia could delay treatment [17]. Another local NHS Grampian policy is the requirement of Hypo Box in all wards. It contains essential treatment options such as glucoboost, glucotabs, fresh juice, glucagon and intravenous glucose needed for hypoglycaemia management. It is reassuring that 90% of the subjects knew its location.

As shown in Fig. 1 there is a significant gap in staff knowledge on appropriate management of hypoglycaemia in conscious and unconscious patients as very few participants marked all the correct responses. This is therefore an area of focus for future educational needs in our cohort. Of note the HCAs working in the wards (one in each ward) appears to have a decent understanding of the level of hypoglycaemia. This is probably because of the change in the nature of HCA work which now involves more clinical tasks such as measuring and recording of blood glucose levels.

As we now move towards specialisation in the field of medicine often staff appears to lack the basic level of knowledge and depends more on specialist input [12,18]. However in a small district general hospital, direct access to specialist is limited and hence there is a genuine demand for the medical and nursing professionals to be well-equipped in the management of common medical problems such as diabetes. Though NHS trusts have a role in encouraging their staff to keep up-to-date, it is ultimately the responsibility of the individual to ensure their knowledge meet the demands. Knowledgeable healthcare professionals who understand diabetes is a requirement of the Diabetes UK guidance [3]. TCA and CPR for foot are easily accessible validated e-learning modules via Turas and AT-Learning that could aid in staff understanding of the management of inpatient diabetes. Reports have shown that the introduction of modules have cut down hypoglycaemia by 20% [19]. In an American study, computer-based educational programmes have shown to enhance staff knowledge in managing diabetes [20]. Consequent impact on improved diabetes control can lead to cost savings.

One of the main limitations of this survey is the small response rate, but it has still captured a reasonable amount of staff working in the small DGH. A study involving larger cohort and more medical and surgical specialities is recommended. Since the participation was voluntary, the response received might not be a true reflection of staff knowledge. Furthermore, the questionnaires were completed unsupervised though staff were encouraged not to discuss or look for reference material, the reliability maybe questionable.

5. Conclusion

This survey has demonstrated that the staff knowledge on managing inpatient diabetes problems is mediocre. Significant gaps have been identified which would be targeted for future educational events. The authors in this study have presented the findings of this survey at the hospital meeting and emailed it to the entire department. Staff are encouraged to complete the TCA and CPR for foot modules with the diabetes team in the hospital intending to take a more active role in staff education.

Conflicts of interest

All the authors declare no competing interests.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.dsx.2019.03.028.

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