

# Third Annual National Diabetes Inpatient Conference

## Raising the standard of inpatient care

This is a report from the Third Annual National Diabetes Inpatient Conference, held on 14 December 2009 at the Hotel Ibis, Earls Court, London. The gold sponsor of the event was sanofi-aventis. This meeting report was generated independently by the publisher and conference speakers, with whom editorial control rests.

“We had no trouble choosing the first topic for this year’s conference,” began David Kerr, Consultant Physician, Bournemouth and Conference Chair. “Despite many initiatives across the country, the problem of insulin prescribing errors in hospital won’t go away, and we need to get a feel for the size of the problem.”

### The size of the problem: Examples of typical insulin errors

“The National Patient Safety Agency (NPSA) is a special authority of the NHS, and the attention of its medical safety team for all of 2010, and probably beyond, is focused on insulin,” according to David Cousins, Head of Safe Medication Practice and Medical Devices, NPSA, London.

The NPSA receive approximately 100 000 clinical incident reports each month, of which between 8% and 10% are to do with medications. Of these, 10% are harmful. Between 2003 and 2009, there were 13 000 incident reports related to insulin.

Sixty per cent of medication errors involving insulin can be attributed to three issues: wrong dose, strength or frequency; omitted medicine; or the wrong medicine being administered. With regard to insulin, the wrong dose being administered is a worryingly frequent occurrence. There are a number of causes including confusion over the use of insulin syringes

### Introduction

The Diabetes Inpatient National Network (DINN) was established to address the sub-optimal standard of acute diabetes care in the UK. DINN was founded by Maggie Hammersley and David Kerr (Consultant Physician and Acute Care Diabetologist, John Radcliffe Hospital, Oxford, and Consultant Physician and Diabetologist, Bournemouth Diabetes and Endocrine Centre, respectively). This conference provided practical information to help clinicians deal with problems in diabetes care delivery. Insulin prescribing errors, pitfalls and problems in pre-hospital care, and the challenges of diabetic ketoacidosis and hyperglycaemia during dialysis all formed part of the exciting programme. This report summarises the key points from each speaker.

and pens. For example, in 2007 an older person was unlawfully killed when a community nurse who was unfamiliar with the person’s insulin pen used an IV syringe rather than an insulin syringe to give 34 units of insulin, which resulted in her administering 340 units.

Multi-use pens can also cause a number of issues, and U-500 insulin may cause confusion and possible overdose. A rapid response from the NPSA is due out in 2010 covering the incorrect administration of insulin.

Use of abbreviations of the term “units” can lead to ten times overdoses when “U” is read as “0”. The NPSA recommends using units/mL rather than U/mL or IU/mL; however, until this is adopted by all manufacturers and healthcare professionals, the letter “U” will continue to cause incidents. In Scotland, an inpatient was given 40 units instead of 4 units of insulin as the person administering the dose read 4U as 40.

In a similar vein, company branding can cause problems as the names of different insulins manufactured by the same company are so similar. look-

a-like labelling and packaging of insulin products can lead to mis-selection errors. The NPSA has issued a design guide to help companies develop products that are well differentiated. The use of barcodes on insulin products during dispensing and administering insulin will further reduce wrong insulin errors.

In Northern Ireland, CREST (Clinical Resource Efficiency Support Team) are setting a good example with their guidelines – but what can we do? David concluded, “currently safety alerts are only sent to healthcare professionals – perhaps we should also send them to people with diabetes to make them aware of what can go wrong?”

### Medico-legal aspects of poor prescribing

“There is no doubt that the Medical Protection Society has seen a large number of prescribing errors, but the NHS doesn’t seem to be learning from them” began Professor Carol Seymour, Medico-Legal Advisor and Barrister non-practicing, London. In Professor Seymour’s experience, avoidable adverse events are too common in the NHS and,

despite the NHS strategy for reducing error (Department of Health, 2003a; 2003b), there is an apparent high tolerance of adverse events. Therefore, clinical governance in medicine is a very important exercise.

Professor Seymour gave several case examples of poor practice leading to legal action. A 56-year-old woman with type 1 diabetes attended a hospital clinic and a letter was sent to the GP surgery suggesting a change in insulin and dose. This was filed and no changes were made until a new GP joined the practice, saw the letter and made the changes. At the following review, the woman was found to have gross retinopathy and peripheral neuropathy. No letter had been sent to the woman. The woman complained and a claim was made successfully. Unfortunately, this is not an uncommon occurrence and results from poor communication with the person with diabetes and a lack of coordination when checking repeat prescriptions.

Approximately 10% of people admitted to hospital have experienced an adverse event, of which one-third increased

disability or led to death. Worryingly, half of all these adverse events could have been prevented (Vincent et al, 2001).

In law, lack of experience is not an acceptable defence. Professor Seymour reminded the audience to encourage their trainees to continually ask questions, even if they are very simple, rather than taking the view that they know the answer or will be looked down on for asking a question. Communication breakdown is one of the most common reasons for errors to occur.

“The key,” said Professor Seymour, “is to realise that each patient is an individual. You must take nothing for granted, and question your colleagues’ decisions, even if you know them well.” If you are going to deviate from the locally agreed protocol, the reasons must be justifiable and documented so that the Medical Protection Society is in the best position help you.

### **What can we do about it? A nurse perspective**

“Unfortunately, insulin errors seem to be a part of life.” began June James, Consultant Nurse, Leicester. She set a few questions to the audience:

- What can we do about insulin errors?
- Is education the answer?
- Is rationing available insulin the answer?
- Should the diabetes team be involved?

The diabetes specialist nurse (DSN) can be instrumental in reducing adverse errors related to insulin prescribing. Courtenay et al (2007) conducted a study to determine the effect that a DSN with the skills to prescribe could have on adverse events within their local unit. An audit in 2005 showed delays in diabetes treatment,

inaccuracies in antidiabetes therapy prescriptions, startling knowledge gaps among staff and people with diabetes, poor access to diabetes healthcare professionals and increasing levels of adverse prescribing and management errors. Following an non-intervention period, a DSN was introduced to the wards for a few months.

It was shown that the DSN reduced the total number of prescribing errors by over 50% and reduced length of stay by 2 days ( $P < 0.001$  for both). This translated into a cost saving of £132 500. Several other studies back-up these findings that having a DSN as part of the multidisciplinary team improves care and is cost-effective (Cavan et al, 2001; Sampson et al, 2006; Flanagan et al, 2008).

Despite the wealth of evidence showing the positive impacts of DSNs on insulin errors, staff education, length of stay and cost, only around 50% of acute Trusts include a DSN as part of the multidisciplinary diabetes team.

June turned to the issue of whether insulin rationing should be introduced to avoid prescribing errors brought about by poor knowledge, with only those competent to prescribe being allowed to do so. However, this might stop patients from receiving their insulin, and poor knowledge should be addressed.

Finally, June believes that there needs to be a no-blame culture as far as clinical incident reporting goes.

### **What can we do about it? A medical perspective**

Rifat Malik (Consultant Diabetologist, London) began by emphasising that people make medication mistakes for a variety of reasons, including fatigue, heavy workloads and a lack of

resources. It is important to distinguish between warranted variation of care – which is necessary when delivering individualised care – and unwarranted variation, that could cause harm.

Dr Malik agreed that a no-blame culture is most effective, as long as healthcare professionals remain accountable (Wachter and Pronovost, 2009). “The focus instead,” said Dr Malik, “should be on identifying error-prone situations and developing systems that minimise the risk of mistakes being made”.

Examples of this are blood-glucose monitoring and insulin prescription charts, which can often be misread or misinterpreted. Dr Malik emphasised the need to improve insulin prescribing quality. His team introduced a paper-based chart that had more built-in insulin prescribing decision support to aid non-specialists. An alternative way of improving the interpretation and clarity of the charts is through e-prescribing, where the form can be filled in electronically, with “pop-ups” and alarms helping to prevent mistakes.

### **The “heart-sink” phone call**

An interactive roundtable discussion took place between Colin Dayan (Consultant Senior Lecturer in Medicine and Head of Clinical Research, Bristol), Mark Savage (Consultant Physician, Manchester) and Esther Walden (Diabetes Inpatient Facilitator, Norwich). The panel discussed whether to discharge people in the following scenarios: a post-surgical patient with a sodium level of 121 mmol/L and a blood glucose of 24 mmol/L, and a 76-year-old woman with Alzheimer’s who is to be discharged in 2 hours, she

lives alone and is still on a sliding scale.

The panel first discussed the post-surgical patient and wondered whether blood had been taken from a drip line that had glucose being infused, as this would give an incorrectly high blood glucose level. If her blood glucose really was that high, she could have undiagnosed diabetes. The panel decided that if she was well enough she could be discharged with follow-up in a clinic a few weeks later to look out for hyponatraemia. The panel emphasised the importance of a full clinical examination and assessment before discharge or treatment.

The woman with Alzheimer’s was then discussed and the panel wondered why she was treated with a sliding scale as this approach is generally not recommended. The panel decided that a DSN should initiate a subcutaneous insulin regimen and made it clear how important family or social care would be in this scenario. Dr Dayan also emphasised that diabetes teams can use their expertise and access to immediate follow-up to discharge higher risk patients than general medical teams.

### **Pre-hospital care: Pitfalls, problems and peculiarities**

Adrian Scott (Consultant Physician, Sheffield) surprised delegates with the high number of admissions to hospital due to hypoglycaemia. Hospital Episode Statistics for 2005/6 state as many as 11 000 admissions for that period.

He also pointed out that people with insulin-treated type 2 diabetes are at risk of hypoglycaemic episodes. In fact, a study by Leese et al (2003) found that people with insulin-treated type 2 diabetes had as many

hypoglycaemic episodes as people with type 1 diabetes.

As well as frequent visits to hospital, people with diabetes also have less favourable outcomes following operations. A study by Krolikowska et al (2009) found that after a non-cardiac operation, people with diabetes had a significantly higher mortality rate than people without diabetes (21-day mortality was 3.5% in the diabetes group vs 0% in the non-diabetes group;  $P < 0.05$ ).

“Could this be improved by ‘pre-habilitation?’” asked Dr Scott. Pre-habilitation begins with a letter sent to the person with diabetes when they are put on the waiting list for an operation, and involves eating a healthy diet and exercising for weight loss, improving glycaemic control and smoking cessation for at least 4 weeks before and 4 weeks after the operation. This would be supported in primary care with regular follow-up appointments to encourage the individual and track their progress.

Dr Scott made it clear that although there have not been any randomised controlled trials investigating the benefit of pre-habilitation, it may be a good opportunity to improve glycaemic control while there is motivation.

### Sudden deterioration during the management of diabetic ketoacidosis

Maggie Hammersley (Consultant Physician and Acute Care Diabetologist, Oxford) reminded delegates that diabetic ketoacidosis (DKA) is a serious complication of diabetes occurring from a combination of hyperglycaemia, ketosis and acidosis. The therapeutic goals in treating DKA are the improvement of the circulatory volume, reduction of blood glucose levels, clearance of ketones, correction of electrolyte

imbalances and identification and treatment of precipitating factors (most often cessation of insulin).

Dr Hammersley emphasised that measurement of blood ketones as part of bedside monitoring now represents best practice. People with DKA can experience a rapid drop in blood glucose levels after the ketoacidosis is treated, and one common mistake is to let the levels fall into the hypoglycaemic range. Rebound ketosis, driven by a counter-regulatory hormone response, may then occur. “If people have bouncing ketones and bicarbonates, they’re going to be in hospital longer,” said Dr Hammersley, making it clear that appropriate treatment can shorten the length of stay and reduce healthcare costs.

### Hyperglycaemia in dialysis patients

Colin Close (Consultant Diabetologist, Taunton) highlighted that the incidence of end-stage renal disease (ESRD) as a result of diabetes was 19.6% in England in 2007 (US Renal Data System, 2009). The 5-year survival rate in people with diabetes on peritoneal dialysis is only 25%, and 28% for people on haemodialysis compared with 35% of all people on dialysis, so diabetes negatively affects the survival rate (US Renal Data System, 2009).

Glucose metabolism is different in people with ESRD. The kidneys play a role in gluconeogenesis and this counter-regulatory response is reduced. Clearance of insulin is also reduced when the kidneys are not functioning, and this needs to be taken into account during treatment.

Diabetes drug regimens should be adjusted for those with ESRD, and Dr Close provided

practical examples for each type of medication, including thiazolidinediones and insulin.

Dr Close did not recommend using pioglitazone or rosiglitazone in people with ESRD because, although no accumulation of metabolites occurs and the pharmacokinetics of the drugs are unaffected by haemodialysis, these drugs are associated with fluid retention and heart failure and their long-term cardiovascular safety remains unclear (Nesto et al, 2003).

Regarding insulin therapy, “it is important to tailor the regimen to the individual” said Dr Close, “and a basal-bolus regimen will offer the most flexibility”.

### Cultural and gender challenges for inpatient diabetes care

Dev Singh (Consultant Physician, Wolverhampton) challenged delegates to organise their care pathways to provide excellent care to everyone, regardless of gender, ethnicity or social deprivation.

He has developed a model of care that has been tested in Wolverhampton called the BRIDGE (Bridging and Resourcing Integrated Diabetes care Gaining Equality) project.

This service was developed through focus groups that identified service provision needs, such as a lack of human resources and time constraints, and user needs, such as a lack of good public transport and inconvenient appointment times.

Dr Singh emphasised that for an integrated diabetes care model to be successful it must focus on the person with diabetes. He said “we need to deliver appropriate, effective care, risk-managed according to need rather than age, gender, ethnicity or social deprivation.”

Results from an analysis of a local diabetes outreach project (Mahto et al, 2009) for inpatient care showed that after 1 year of using the new pathway, fewer people with diabetes were being admitted to hospital overall. When the data were broken down by cause of admission, general diabetes-related admissions had gone down and admissions for specialist needs (such as renal disease, or cardiac problems) had increased, showing that people who needed specialist care were now in the right place.

“For us at Wolverhampton Diabetes Care, diabetes outreach services seem to be a way forward to looking after people with diabetes as a whole and delivering specialist diabetes input to inpatients in an acute medical setting” said Dr Singh. “Whether this is applicable elsewhere, and will be embraced by others, remains to be seen”. ■

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