Association of British Clinical Diabetologists

ABCD
Spring Meeting
The Met Hotel, Leeds
26th & 27th April 2012

POSTERS

Posters will be on display in the Met Suite. They will be available to view during all meeting breaks.

1 Flexible once-daily dosing of insulin degludec has comparable efficacy and safety to insulin glargine dosed once-daily at the same time each day in type 2 diabetes.

Bain S (1), Atkin S (2), Gough S (3), Shestakova M (4), Raz I (5), Blonde L (6), Meneghini L (7), Begtrup K (8), Johansen T (8) Birkeland KI (9.

(1) Singleton Hospital, Abertawe Bro Morgannwg University Health Board, Swansea, UK; (2) Hull York Medical School, Michael White Diabetes Centre, Hull, United Kingdom; (3) Churchill Hospital, Oxford Centre for Diabetes Endocrinology and Metabolism, Oxford, UK; (4) Endocrinology Research Center, Diabetes Institute, Moscow, Russia; (5) Hebrew University of Jerusalem & Hadassah University Hospital, Diabetes Unit, Jerusalem, Israel; (6) Ochsner Medical Center, Ochsner Diabetes Research Unit, New Orleans LA, USA; (7) University of Miami, Miller School of Medicine, Miami FL, USA; (8) Novo Nordisk, Global Development, Søborg, Denmark; (9) University of Oslo & Oslo University Hospital, Faculty of Medicine, Oslo, Norway.

The primary objective of this trial was to evaluate the non-inferiority of IDeg dosed flexibly (IDegFlex) with insulin glargine (IGlar) dosed once daily at the same time each day. In this 26-week, open-label trial, patients with type 2 diabetes (HbA[1c] 8.4%, fasting plasma glucose [FPG] 8.9 mmol/L, diabetes duration 10.6 years) were randomised to IDegFlex (with compulsory alternating morning–evening dosing schedule, creating 8–40 hour intervals, n=229) or to IGlar (given at the same time each day, according to label, n=230). Insulin was added to existing oral antidiabetic therapy (OAD) therapy (if any) and titrated to an FPG target of 4.0–4.9 mmol/L. IDegFlex and IGlar improved glycaemic control to a similar extent; a reduction in HbA[1c] of 1.28 for IDegFlex and 1.26 %-points for IGlar were observed compared to baseline (estimated treatment difference [ETD] IDegFlex-IGlar: 0.04 %-points [95% CI: -0.12; 0.20]); non-inferiority was confirmed. Mean FPG was significantly lower with IDegFlex than IGlar (5.8 vs. 6.2 mmol/L; ETD: -0.42 mmol/l [-0.82; -0.02], p=0.04). Mean insulin dose, weight gain and rates of adverse events were similar. Rates of confirmed hypoglycaemia (plasma glucose <3.1 mmol/L or severe) were comparable for IDegFlex and IGlar (3.6 vs. 3.5 episodes/patient yr; estimated rate ratio [ERR] IDegFlex/IGlar: 1.03 [0.75; 1.40], p=NS) as were rates of nocturnal confirmed hypoglycaemia (0.6 vs. 0.8 episodes/patient yr; ERR: 0.77 [0.44; 1.35], p=NS). The use of extreme dosing intervals showed that IDeg can be dosed flexibly at any time of the day without compromising glycaemic control or safety, compared with IGlar, which may facilitate integration of insulin therapy with patients' lifestyles.

2 A Hyperglycaemia Management Pathway Safely Reduces Hospital Admissions

Roselle Herring, Claire Pengilley, Helen Hopkins, Beverley Tuthill, Sue Davidson, David L Russell-Jones. Guildford.

Up to one fifth of inpatients in the United Kingdom have diabetes. In most cases patients are admitted under the care of non-specialist teams. Patients may be admitted unnecessarily or have their discharge delayed if the admitting team do not feel sufficiently confident to make decisions on diabetes care. We have developed a management of raised glucose(MoRG)pathway for use by medical physicians as an admission avoidance initiative.

This was an interventional study. Clinical practice was evaluated during phase 1. All patients assessed in the Medical assessment unit (MAU) by an acute medical physician with a blood glucose meter reading >11.1mmol/L were identified. 11.1mmol/L was based on the World Health Organisation diagnostic criteria for diabetes. Data was collected on acute assessment, diagnosis and management. The MoRG pathway was introduced and its impact assessed during phase 2. Key assessment requirements included plasma glucose, plasma ketones and urea and electrolytes.

Results

Phase 1. 72 patients were identified over a period of 156 days. 100% were admitted. 63% were started on an intravenous insulin infusion. Hyperglycaemia was the primary admitting diagnosis in 32 patients, of which 15 patients had new or known type 1 diabetes and 17 had type 2 diabetes.

Phase 2. The pathway has been used for 104 patients. Hyperglycaemia was the primary diagnosis in 50 patients. 20 patients (40%) were discharged within the same calendar day(0 vs 20, $p < 0.0001$) Median length of stay was lower in the intervention group (3.5 vs 1.0, $p < 0.0003$) and median bed day cost per patient was significantly reduced in the intervention group. (£787.50 vs £225.$p=0.04$.) There was no difference in readmission rates ($p=0.17$.)

There was a significant shift from inpatient diabetes specialist assessment to outpatient assessment. ($p=0.0003$) and a reduction in the use of intravenous insulin infusions ($p=0.0086$)

Conclusion

With a simple assessment in MAU and careful clinical evaluation using an innovative algorithm, 40% of patients presenting with raised blood glucose can be safely discharged preventing costly hospital admissions. Additionally, the pathway was associated with improvements in inpatient diabetes care, a reduction in length of stay and improved patient satisfaction. We feel confident we have validated the algorithm and have introduced it in Accident and Emergency to prevent further admissions.

3 Diabetes and Care Homes: Survey Outcomes in Greater London.

C Kirk (1), E Casey (1), HS Chahal (1), R Mughal (2), R Goriparthi (3), K Nikookam (1).
(1) Department of Diabetes & Endocrinology, King George Hospital, Barking, Havering & Redbridge University Hospitals NHS Trust, Greater London; (2)GPwSI in Diabetes, NHS Redbridge; (3)GPwSI in Diabetes, NHS Barking & Dagenham.

Introduction

Increasing numbers of older people are living with diabetes, many in sheltered accommodation or institutional care, with a diabetes prevalence of at least 10% in these settings. This vulnerable population are at increased risk of recurrent hospital admissions and complications. Guidelines have been published by Diabetes UK in 2010 to enhance diabetes care in care homes.

Methods and Aim

Using a questionnaire adapted from the Institute of Diabetes for Older People (IDOP), we surveyed five warden-controlled accommodation and two nursing homes in Greater London. Our aim was to evaluate the relevance of existing policies for residents with diabetes versus the "Good clinical practice guidelines for care home residents with diabetes" by Diabetes UK.

Results

Only one of the care homes had a written policy for diabetes management. Despite a maximum potential capacity of 319 residents, only one care home had individualised diabetes care plans. 71% of care homes screened residents for diabetes. All care homes organised an annual diabetes review. 43% of residents with diabetes had access to regular visits from a Diabetes Specialist Nurse (DSN) or a GP with a Special Interest (GPwSI) in Diabetes.

Conclusion

We have demonstrated suboptimal care for diabetic patients in care homes. Managers and responsible medical personnel should strive to ensure they have agreed local policies for diabetic patients in accordance with the clinical practice guideline. Greater involvement by DSNs, GPwSIs and ease of access to secondary care Diabetologists should be encouraged and recommended to Clinical Commissioning Group

4 A New National Clinical Service for Patients with Severe Insulin Resistance or Lipodystrophy.

Anna Stears, Julie Harris, Catherine Hames, Charlotte Jenkins Liu, Claire Adams, Rachel Williams, David Dunger, David B. Savage, Robert K. Semple, Stephen O'Rahilly.
Addenbrookes Hospital, Cambridge.

Background

Severe insulin resistance (SIR) and lipodystrophy are rare disorders associated with severe morbidity and early mortality. Research in our centre has assembled an international cohort of nearly 1000 affected patients and has contributed to identification of 9 novel genetic syndromes. More recently integrated biochemical and genetic diagnostic algorithms have been established in our NHS laboratories, and in April 2011 a national multidisciplinary (MDT) service for patients in England with SIR was commissioned by the National Specialised Commissioning Team (NSCT).

Service aims

The service aims to provide diagnostic, therapeutic and educational support both for patients with lipodystrophy and/or SIR, and for their local specialist teams, and to establish and disseminate evidence-based recommendations for their management.

Referral criteria

The service accepts referral of adults and children with 1) Clinical suspicion of insulin receptor defects, from neonatal Donohue Syndrome to adult type A insulin resistance 2) Clinically diagnosed lipodystrophy (generalised or partial), and 3) Unexplained SIR with BMI<30 kg/m2 and acanthosis nigricans and/or severe hyperinsulinaemia.

Service structure

The core elements are a weekly MDT clinic and meeting and customised diagnostic evaluation of patients in liaison with genetic and biochemical laboratories. For selected patients, treatment with agents such as leptin, rhIGF-1, U500 insulin and GLP-1 agonists is supervised directly; however ongoing care is shared, using close dialogue with local specialists.

Conclusions

The National Severe Insulin Resistance Service is a new NSCT-funded multidisciplinary service aiming to improve management and clinical outcomes for patients with lipodystrophy and/or SIR. Referrals to the service can be made directly by local specialists.

5 The 'Piecing Together Diabetes' educational tool improves healthcare professional confidence, knowledge and inpatient diabetes care.

Roselle Herring (1), Claire Pengilley (1), Helen Hopkins (1), Beverly Tuthill (1), Natasha Patel (2), Clare Nelson (3), Anne Currie (4), David L Russell-Jones (1).
(1) Royal Surrey County Hospital, Guildford; (2) St Georges Hospital, London; (3) Northern General Hospital, Sheffield; (4) Hillingdon Hospital. Middlesex.

Twenty percent of the United Kingdom's inpatient population have diabetes. In 2009, the National Diabetes Inpatient Audit identified that healthcare professionals often lack the confidence and knowledge to manage this patient group appropriately.

We have developed a novel interprofessional diabetes educational tool for use in the hospital environment. The jigsaw design incorporates all aspects of inpatient care from admission to discharge. Diabetes specialists facilitate learning through a combination of discussions, skills and activities.

The education tool was piloted in four hospitals in the United Kingdom. Thirty-one healthcare professionals were educated: 3 pharmacists, 17 nurses, 8 healthcare assistants and 3 junior doctors. The educational intervention was evaluated using Kirkpatrick's model, which assessed the learner's reaction, learning and behaviour and clinical outcomes related to key areas of inpatient diabetes care.

Results

Healthcare professional's confidence improved from 58% to 94% (p=0.002) and knowledge improved from 12.4±0.6 to 15.0 ±0.6 (mean ± SEM, p=0.005)

Appropriate blood glucose monitoring improved from 67% to 92% (p=0.026). Management errors were reduced from 74% to 44% (p=0.045) with appropriate hypoglycaemia management improving from 9% to 75% (p=0.003). The number of patients with documented foot assessment improved from 15% to 33% (p=0.036). Improvement in the number of appropriate diabetes referrals and reduction in prescribing errors did not reach statistical significance.

The well designed inpatient-teaching tool can be delivered effectively to healthcare professionals. The adaptability of the modules both in time and content made it user friendly. Widespread application of this tool could provide hospital staff with a robust, flexible and validated education tool, improve patient safety and potentially reduce inpatient care costs.

6 Metabolic outcomes following initiation of Liraglutide.

E Panteliou (1), JP McDowell(1), HS Chahal(1), R Goriparthi(2), A Ansari(2), A Gupta(2), M McCullagh (2), E.Whitlock (3), E Casey (1), K Nikookam (1).
(1) Department of Diabetes and Endocrinology, King George Hospital, Barking, Havering and Redbridge University Hospitals NHS Trust, Greater London; (2) GPwSI in Diabetes and Diabetes Nurse, Barking & Dagenham Primary Care Trust, Essex; (3) Diabetes Nurse Consultant, North East London Foundation Trust, London.

Introduction

Liraglutide is a GLP-1 analogue which recently received a license in the UK (1), however, studies in its use have only been performed in a hospital setting. Porter's Avenue is a community based, complex Diabetes Clinic, staffed by GPwSI's in diabetes, diabetes specialist nurses, dietitians and psychologists, all of whom are supervised by a diabetes consultant. The clinic provides care for a population of approximately 170,000. Patients with type 2 diabetes are referred to the clinic if their HbA1c is over 8% despite being treated with the maximum oral hypoglycaemic medications, with or without additional insulin therapy.

Methods

This was a retrospective study evaluating the outcomes of patients with type 2 diabetes after Liraglutide treatment. The parameters measured were changes in weight, HBA1C and insulin requirements, which were reviewed at baseline, 6 months and 12 months.

Results

This study comprised of 67 patients with 46% male and 54% female. The age at commencement of Liraglutide was 54.5±9.2 years (mean±SD). By 12 months there was a reduction in weight of 6.2±3.7%, p=0.01, from a baseline of 111.07±22.8kg and a reduction in HBA1c of 1.3±2.1% from a baseline of 10.2±2.0%, p= 0.01.

At the beginning of the study, 44 (66%) patients were on insulin therapy whereas by 12 months 11.4% no longer required insulin therapy and a further 59.1% had a reduction in insulin requirements of 45.0±42.7% units per day, p=0.001.

Conclusion

In the UK, patients with type 2 diabetes are now mainly treated by General Practitioners, however the majority of studies in the initiation of medications for these patients occur in the hospital setting. Our study has shown that in a supervised community setting Liraglutide can lead to significant reductions in weight, HBA1c and insulin requirements of patients with poorly controlled type 2 diabetes.

References

1) http://www.nice.org.uk

7 We report an unusual cause of Continuous Subcutaneous Insulin infusion CSII pump malfunction.

Dr E Saeed, Dr I Gallen.
Wycombe General Hospital.

A 42 year old male with a 14 year history of uncomplicated T1DM, was started on Animas 2020 CSII pump therapy. He found glycaemic control to be significantly worse on pump therapy, noting that the insulin did not seem to work as well as injections and with hyperglycemia which was unresponsive to bolus insulin doses. He was concerned that there was pump malfunction, and the pump was checked. Although inspection did not reveal any fault it was replaced by the manufacturer. However, problems continued with the replacement device. It was noticed that the pump seemed to work well whilst away from work.

The patient's occupation was a print machine engineer, maintaining printing machines and their heavy electrical motors (Koenig & Bauer KF80AG). The plant has 8 printing machines, with each reel stand containing 4 powerful electromagnets. His work required removal of the casing of these machines.

To demonstrate the pump malfunction the pump was left at the approximate work distance from the machine. Whilst infusion rate was normal, the pump failed to deliver any insulin.

Measurements of the magnetic field flux density showed that the ambient field in the workplace ranged from 5-7 gauss, but in the area of uncovered motors was 25-30 gauss[1].

Our hypothesis is that the varying magnetic field exposure caused intermittent variation in insulin infusion rate leading to deterioration in glycaemic control.

Pump manufacturer information warns of the effect of strong magnetic field in the context of MRI and fun park amusement rides. CSII been designed to operate in the presence of common sources of electrostatic and electromagnetic interference, including airport and store security systems[2]. However, like all portable electronic devices, the pump should not be exposed to very strong electromagnetic fields, such as in MRI's, RF welders or magnets used to lift automobiles. It is advised that very strong magnetic fields, such as in an MRI, and on "free-fall" amusement Park rides can re-magnetize the portion of the motor that regulates insulin delivery. Pump manufacturers recommend that CSII pump is removed beforehand and keep it outside the room during the procedure.

Electric motors in the insulin pump have a current carrying conductor which generates a magnetic field. This field will create a mechanical energy which will help to deliver the insulin. Therefore presence of strong magnetic fields can interfere with motor of the insulin pump.

There are many industries that have high strength magnetic field [3]. The most frequent source of exposure is electrified railways systems, which have magnetic fields up to 2 mT, and these values have been recorded in the passenger car of a London Underground train[4] . Aluminium production factories were also found to have magnetic fields as high as 63 mT, but workers generally exposed to less than 20 mT. In the MRI setting magnetic flux densities up to about 1 Tesla were measured near the magnet, but these had dropped to less than 30 mT at 2 m and to a less than 5 mT at the operator console position. Therefore reviewing the occupational and travel history may reveal a risk of exposure to electromagnetic fields which may affect CSII pump function.

[1] **(**1 Gauss = .0001 Tesla = 0.1 milli Tesla)
[2] Animas 2020 user guide, Animas, **West Chester, PA 19380, USA**
3 Environmental Health criteria 232: (2006) : Static fields, **WHO, Geneva , Switzerland ISBN 92-4-157232-9**
4 Chadwick P and Lowes F 1998 Magnetic Fields on British Trains Annals of Occupational hygiene **42** 331-335

8 A Mixed Up Family.

Z Htike (1), R Kela (2), R Gregory (3).
(1) Specialty Registrar (Diabetes & Endocrinology), University Hospitals of Leicester NHS Trust; (2) Consultant Physician (Diabetes & Endocrinology), Doncaster and Bassetlaw Hospital NHS Trust; (3) Consultant Physician (Diabetes & Endocrinology), University Hospitals of Leicester NHS Trust.

A 55 year old lady was treated with insulin for her diabetes which was diagnosed at the age of 9 years. After initial insulin therapy, she was prescribed tolbutamide but in view of insufficient response was put back on insulin. She developed necrobiosis on left shin at age 12, thyrotoxicosis at age 18 and 53, ischaemic heart disease at age 48, celiac disease at age 51 and sensory hearing loss at age 54. Glycaemic control has always been good on small doses insulins without any microvasular complications.

Her daughter who is also known to have type1 diabetes delivered a baby girl recently but did not require insulin for 2 months post-partum. This information along with our patient's confession that she in fact did not take her prescribed tolbutamide without major decompensation during her pre-pubertal period generated interest in clarifying the type of her diabetes. Family history revealed patient's mother, grandmother and son were diagnosed of diabetes at young age and been treated with insulin. Son had DKA on presentation at age 17

Mitochondrial diabetes was suspected but genetic tests confirmed HNF1A mutation in the index case, her mother and daughter with son not being affected of mutation. MODY members were found to have detectable urinary C-peptide levels and patient and her daughter took the offer of switching to gliclazide which led to maintained glycaemic control and much improved psychosocial wellbeing.

This 'mixed up family' has members with MODY and type 1 diabetes and one of the MODY member also co-incidentally exhibited two autoimmune conditions.

9 Euglycaemic diabetic ketoacidosis in pregnancy.

N Ranjan, K Towse, S Song.
Diabetes Centre, Northern General Hospital, Sheffield.

Euglycaemic diabetic ketoacidosis (DKA) is a diagnostic challenge in pregnancy. We present a case to illustrate this point. A 19 year old female with type 1 diabetes was reviewed routinely in the antenatal clinic at 26 weeks gestation. She had mild flu like symptoms but not unwell clinically. Although her home blood glucose readings were within the target recommended for pregnancy (fasting <6 mmol/l and 1 hour post meal <8 mmol/l), blood ketone level was checked and was found to be raised at 2.3 mmol/l with venous bicarbonate of 20 mmol/l. She was admitted for observation. Over the next few hours, the bicarbonate level dropped to 16 mmol/l although her blood glucose remained below 10 mmol/l and she remained relatively symptom free. Treatment for DKA was commenced. In the next 48 hours, she made a complete recovery with resolution of the ketoacidosis. The pregnancy progressed without further complications and she was successfully delivered at 38 weeks gestation.

This case illustrates the occurrence of DKA in the presence of normoglycaemia and minimal symptoms during pregnancy. In routine clinical practice, investigations to detect ketoacidosis would not have been performed in this situation. Since DKA can progress rapidly in pregnancy compounded by the fetal vulnerability to acidic milieu, it is conceivable that this pregnancy could have ended tragically. A high index of suspicion is therefore required even in clinical circumstances not typical of DKA. This can be achieved by raising awareness among healthcare professionals and critical review of current management protocol.