A5 (P240) Reduced exercise activity is associated with increased anxiety in type 1 but not type 2 diabetes

S. J. Westall1; R. P. Narayanan; H. Sullivan; S. Bujawansa; N. Furlong; S. McNulty; J. Cardwell; L. Mitchell; J. Jackson; K. Hardy
Department of Diabetes and Endocrinology, St Helens and Knowsley Teaching Hospitals NHS Trust, St Helens, UK

Aims: Increased physical activity and a healthy lifestyle underpin efforts to prevent type 2 diabetes and are cornerstones in managing type 1 and type 2 diabetes. Not only is reduced activity associated with risk of weight gain and adverse metabolism, but it is also mooted to be associated with impaired psychological wellbeing. We investigated the relationship between self-reported physical activity and levels of anxiety in type 1 and type 2 diabetes.

Method: Before completing structured education, 398 patients completed validated questionnaires evaluating anxiety (Hospital Anxiety Depression Scale, HADS) and self-care activity, including exercise (Summary of Diabetes Self-Care Activities, SDSCA). For HADS, an anxiety score ≥ 8 indicates potentially clinically significant anxiety. SDSCA scores are outputted as ‘number of good days per week’ on a scale of 0–7. Results were analysed in SPSS.

Results: In people with type 1 diabetes, undertaking more days of exercise per week than average (<3.09 vs. ≥3.09) suggested a reduced risk of clinically significant anxiety, RR 0.42 (0.20–0.88, p < 0.05). Reduced levels of exercise activity correlate with increased levels of anxiety (r = −0.39, p < 0.05). In type 2 diabetes, by contrast, no such relationship was observed.

Discussion: Our study suggests reduced levels of exercise in people with type 1 diabetes increases anxiety. In contrast to type 2 diabetes, those with type 1 diabetes may be more susceptible to the impact of reduced physical activity on anxiety levels. The small sample size of type 1 patients is a limitation. Further work to increase sample size should be undertaken.

A6 (P67) A novel early pregnancy screening tool for the prediction of gestational diabetes

R. D’Arcy1,2, I. Cooke1, D. McCance1, M. McKinley3, U. Graham1
1Regional Centre for Endocrinology and Diabetes, Royal Victoria Hospital, Belfast, UK; 2Department of Obstetrics, Royal Jubilee Maternity Service, Belfast, UK; 3Centre for Public Health, Queen’s University Belfast, Belfast, UK

Aims: The National Institute of Clinical Excellence (NICE) recommends selecting women for GDM testing on the basis of risk factors: body mass index ≥30kg/m2, previous macrosomia (neonate weighing ≥4.5kg), family history of diabetes, high risk ethnicity or previous gestational diabetes (GDM) (NG3, 2015). These guidelines have been widely adopted within the UK yet the identified risk factors perform poorly as predictors of GDM (positive predictive value [PPV] 20.8%). We sought to assess the performance of ultrasound measured maternal visceral adipose tissue depth (VAD) as a tool for GDM prediction. This is a straightforward assessment which takes around 5 minutes to perform.

Methods: In a nested observational study, we measured VAD using ultrasonography at <14 weeks gestation in 123 women identified as having at least one NICE risk factor for GDM. All women underwent a 75g OGGT at 28 weeks’ gestation which was analysed using WHO criteria and 26 women (21.1%) developed GDM.

Results: Women with GDM had a significantly higher VAD with those without GDM (4.22 ± 0.97cm vs 3.12 ± 1.33cm p < 0.01). Using receiver operator characteristic (ROC) curve analysis, a VAD of 3.98cm achieved a sensitivity of 73.1% and specificity of 72.2% for the later diagnosis of GDM in this cohort. Women exceeding this threshold were at seven-fold greater odds of later GDM diagnosis (OR 7.0). The use of this VAD threshold in this cohort increased PPV to 58.7% with a NPV of 90.9%.

Conclusion: Ultrasound measured VAD is an easily performed and effective tool for the prediction of GDM in at-risk pregnancies.

Diabetes care during covid-19

A7 (P136) Clinical frailty scale (CFS) for risk stratification in younger patients hospitalised with covid-19

A. Sheikh1; S. Lockhart1; A. Daly1; H. Griffiths2; L. Sibal1
1Institute of Metabolic Science, Cambridge University Hospital, Cambridge, UK; 2School of Medicine, University of Portsmouth, Portsmouth, UK

Background and aim: The importance of frailty is recognised in clinical guidelines for the therapeutic management of diabetes in older people. NICE guidelines recommend that therapeutic decisions should be based on CFS in inpatients with covid-19 aged over 65 years though this has not been validated in people <65 years. We assessed CFS in predicting outcomes in people <65 years with and without diabetes hospitalised with covid-19.

Methods: Retrospective analysis of 142 patients, hospitalised with covid-19, aged 35 to 65 years, including 44 patients with diabetes (type 1, n = 5; type 2, n = 39) was undertaken.

Results: Thirty-two patients developed severe respiratory failure requiring ventilation, while 9/14 (64.3%) of those
without prior end-stage renal disease required renal replacement therapy (RRT). There were 7 (7.1%) deaths in individuals without and 3 (6.8%) with diabetes.

In univariate analysis, CFS was associated with mortality [OR 1.92 (1.27–2.89; p = 0.002)], RRT [OR 1.92 (1.27–2.89; p = 0.002)], length of stay (LOS) [OR 6.2 (3.8–8.58; p < 0.001)] in the whole cohort. In people with diabetes, CFS was associated with increased LOS [OR 6.6 (2.1–11.1; p = 0.005)] and need for RRT [OR 1.66 (0.98–2.81; p = 0.058)].

We observed an interaction with BMI whereby the effect of CFS on LOS was greater at higher BMI [β = 0.35 (0.05–0.64, p = 0.021)].

Conclusion: CFS predicts severe covid-19 in people <65 years with and without diabetes. Patients <65 years of age should be assessed for frailty as they may be candidates for early intervention and enhanced monitoring.

A8 (P124)  |  Incidence of deterioration, variance and recovery of E-glomerular filtration rate renal function in patients with diabetes hospitalised with covid-19

E. P. Keddie1; H. Ul-Haq1; S. Hussain1; D. Sharma2
1School of Medicine, University of Liverpool, Liverpool, UK; 2Diabetes and Endocrinology Unit, The Royal Liverpool University Hospital, Liverpool, UK

Aim: To analyse the incidence and variance of renal dysfunction in hospitalised, covid-19, patients with diabetes and its recovery in survivors.

Methods: In this retrospective cross-sectional study, we analysed the temporal renal functions of 95 patients with diabetes who were admitted to the Royal Liverpool University Hospital with covid-19. The most recent e-glomerular filtration rate (eGFR) within 6 months pre-admission, during admission and >2-month post-discharge was recorded. Groups were split by their baseline eGFR: Group A >60 mmol/mol, Group B 30–59 mmol/mol, Group C <30 mmol/mol.

Results: Mean length of stay between groups A, B and C was 18.1 (n = 54), 18.1 (n = 26) and 22.5 (n = 15) days respectively. 57 (60%) patients had some degree of renal dysfunction, 43 (45%) patients had a significant drop in eGFR (>10 mmol/mol). In the patients who survived (68%), mean eGFR dropped in groups A, B and C from 79.5 to 68.1 (−14.4%), 45.1 to 34.6 (−23.3%), 25 to 15.6 (−37.6%), respectively. Post-discharge mean eGFR recovered in groups A, B and C to 77 (+13.1%), 46.1 (+33.2%) and 23.4 (+50%), respectively. Of the 65 survivors, 34 experienced renal dysfunction. Of these, 27 (79%) had a full return to baseline renal function within 2 months of discharge.

Conclusion: The prevalence of renal dysfunction in hospitalised, covid-19, patients with diabetes is high with mortality in this group also high. Recovery of eGFR in surviving patients is encouraging with a mean eGFR recovery of >90% in each group at least 2 months post-discharge.

A9 (P206)  |  Clinical features and sequelae of a cohort of people with type 2 diabetes who required initiation of insulin treatment when hospitalised with severe covid-19

A. Corcillo1,2; A. Li2,3; K. Ayoub5; R. Maclean3; M. Iqbal3; E. Llaneza3; G. Noble-Bell3; D. Kariyawasam2; J. Karalliedde1,2
1School of Cardiovascular Medicine & Sciences, King’s College London, London, UK; 2Diabetes and Endocrinology, Guy’s and St Thomas’ Hospital, London, UK; 3Diabetes and Endocrinology, King’s College Hospital, London, UK

Objective: To describe the clinical features of people with type 2 diabetes who required insulin treatment when hospitalised with covid-19.

Methods: Data from 244 people (62% male) with type 2 diabetes hospitalised with covid-19 between the 12 March and 7 April 2020 in two hospitals in London were reviewed.

Results: The median age of the cohort was 73 years (range 21–97). Median (range) pre-admission (within 3 months) HbA1c was 62 mmol/mol (33–134), 47% were on oral agents, 23% on insulin and oral agents, 11% on insulin only and 19% on diet prior to hospitalisation. Of the cohort not on insulin (n = 161), 68 (42%) required insulin during hospitalisation. This group was younger, had less cardiovascular disease, higher HbA1c, more obese, more likely to be African-Caribbean, more frequently admitted to intensive care and had a longer duration of hospitalisation, as compared to those who did not need insulin (p < 0.05 for all). Of the 68 people new to insulin, 22 (32%) stopped the insulin during hospitalisation, 4 (6%) stopped within 6 weeks of discharge and 15 (22%) continued for longer than 6 weeks. Eight people (18%) were on oral corticosteroids during hospitalisation. Median (range) total daily dose of insulin was 0.58 U/kg (0.02–4.53) within 7 days, 0.17 U/kg (0.03–0.84) at discharge and 0.26 U/kg (0.09–0.73) at 6 weeks post-discharge.

Summary: Insulin is frequently required in severe covid-19 and insulin requirements change significantly post-discharge. Input of the diabetes multidisciplinary team and follow-up are needed for these patients.
Diabetic ketoacidosis (DKA) admissions during and before the covid-19 pandemic

A. Entwistle; A. E. Edwards; A. Benjamin; S. V. Gelding; K. Gunganah
Department of Diabetes and Endocrinology, Newham University Hospital, Barts Health NHS Trust, London, UK

Background: The covid-19 pandemic has resulted in patients delaying presentation to hospital with medical emergencies, including DKA. Diabetes is also an established risk factor for poor outcome in covid-19.

Aims: To examine DKA admissions to Newham University Hospital during the covid-19 pandemic, compared to those in the same period pre-pandemic in 2019.

Methods: We retrospectively audited all adult admissions for DKA between March and December 2020 (pandemic), and March and December 2019 (pre-pandemic).

Results: Sixty-six patients were admitted with DKA during the pandemic, 37 male, mean age 44 years. 26% were Black, 22% White British and 16% Asian. The majority had type 1 diabetes—51% pre-existing and 10% newly diagnosed. 39% had known type 2 diabetes. Mean hospital stay was 6.3 days. Only 10 patients had covid-19; all had type 2 diabetes. 23 patients required intensive care, none having covid-19. Five patients died (3 with covid-19).

In the pre-pandemic period there were 34 DKA admissions, 19 male, mean age 40 years, 29% White British, 21% Black and 21% Asian. Most (59%) had known type 1 diabetes, 12% were new diagnoses. 29% had type 2 diabetes. Mean hospital stay was 5.4 days. Six patients required intensive care. No patients died.

Conclusions: DKA admissions doubled during the pandemic with different characteristics to those of the pre-pandemic period: over-representation of type 2 diabetes, and higher acuity and mortality largely independent of covid-19. These findings further suggest that the impact of the pandemic on DKA goes beyond covid-19 itself. People with diabetes may require greater reassurance and support with glycaemic management during this time.

Effect of covid-19 infection on diabetic ketoacidosis (DKA) in people with type 1 and type 2 diabetes

L. Rengarajan1; P. Kempegowda1,2; E. Melson1,2; A. Johnson1; L. Wallett1; D. Zhou1; A. Juszczak2; M. A. Karamat2; P. Narendran2,4; S. Bellary2,5
1Diabetes and General Medicine, University Hospitals Birmingham NHS FT, Birmingham, UK; 2Institute of Metabolism and Systems Research, University of Birmingham, Birmingham, UK; 3College of Medical and Dental Sciences, University of Birmingham, Birmingham, UK; 4Institute of Immunology and Immunotherapy, University of Birmingham, Birmingham, UK; 5School of Life and Health Sciences, Aston University, Birmingham, UK

Introduction: Limited evidence is available on the natural trajectory of diabetic ketoacidosis (DKA) in people with diabetes and covid-19 infection. We studied the effects of covid-19 on presentation, clinical course and outcomes in patients with DKA in comparison to those without the infection.

Methods: A retrospective analysis of all DKA episodes between 01 March 2020 and 30 May 2020 was performed. Patients were classified as covid-positive or negative with a pre-covid group of all DKA episodes from 1 March 2019 to 30 May 2019 as control. Demographics, diabetes type, precipitating factors, biochemistry at presentation and management data were collected.

Results: A total of 88 DKA episodes were included. There was an over representation of type 2 diabetes in covid-positive patients with DKA than in pre-covid or covid-negative groups. There was no significant difference in the severity or duration of DKA between the three groups (12.5 h vs. 14.9 h vs. 17.9 h for covid-positive, covid-negative and pre-covid groups respectively; covid-positive vs. negative, p > 0.99; covid-positive vs. pre-covid, p = 0.8772; covid-negative vs. pre-covid p > 0.99). covid-positive type 1 diabetes were more hyperglycaemic on admission ([60 mmol/L (35.9–60.0)] compared to covid-negative ([31.4 mmol/L (28.0–39.1)] and pre-covid patients ([24 mmol/L (20.2–33.75)]. Six people with covid and four people without covid required intensive care. Five (1/31 covid-negative and 4/20 covid-positive) died. In patients with type 2 diabetes, all deaths occurred in covid-negative group.

Conclusion: The impact of covid on the course of DKA was different between type 1 and type 2 diabetes. People with type 1 diabetes had more hyperglycaemia at admission. Higher proportion of people with type 2 diabetes in the covid-positive required intensive care with increased mortality rates.
A12 (P133)  |  An audit comparing the difference in outcomes between patients with diabetes admitted during first and second wave of the covid-19 pandemic in a large district general hospital

H. Khan; S. Miles; T. Chopra; R. Saksena; F. Kavvoura
Diabetes and Endocrinology, Royal Berkshire Hospital
NHS FT, Reading, UK

Background and aim: Initial data demonstrated increased mortality for patients with diabetes and covid-19. NICE Guidelines subsequently advised dexamethasone treatment in patients hospitalised with covid-19 requiring oxygen. Using NICE and Joint British Diabetes Societies guidelines, we audited data for inpatients with diabetes and covid-19 infection.

Methods: Inpatients with any diabetes type and a concurrent diagnosis of covid-19 infection were identified. We collected data on the two waves on the pandemic; wave 1 (W1) commenced on the 1/3/2020 and wave 2 (W2) on the 1/10/2020. We identified 352 patients; 60 consecutive patients from each wave were analysed. Data were collected on admission outcomes, diabetes type, demographics, co-morbidities, admission medications, and use of continuous positive airway pressure (CPAP) ventilation, mechanical ventilation (MV), dexamethasone and hypoglycaemic agents.

Results: Demographic data were comparable between the two groups. Only four patients with type 1 diabetes were identified. Mortality improved from 45% to 40% between the two waves, respectively. Intensive care admission reduced from 20% to 5% with a 10% reduction in MV and identical rates of CPAP (11.7%). During admission, dexamethasone use increased from 5% to 75% from W1 to W2; as did use of intravenous insulin (11.7% to 16.7%), subcutaneous insulin (30.4% to 48.7%), and sulphonylurea (2.2% to 10.2%). During W2, 12.5% were newly discharged on insulin, compared to zero patients in W1.

Conclusion: Dexamethasone use increased by 70% in the second wave. We observed a reduction in mortality, intensive care admission and mechanical ventilation and higher rates of insulin use in both inpatients and on discharge.

Case reports

A13  |  A case of type B insulin resistance: Investigating and managing uncontrolled hyperglycaemia

A. Saqib1; R. Ismail1; Y. Man3; W. Stelmaszczyk1; A. Riga1; E. Camfield1; S. Brady2; B. Lopez3; S. Thomas1; D. Kariyawasam1
1Department of Diabetes and Endocrinology, Guy's and St Thomas' NHS FT, London, UK; 2Department of Clinical Biochemistry, Guy's and St Thomas' NHS FT, London, UK; 3Department of Rheumatology, Guy's and St Thomas’ NHS FT, London, UK

We present the case of a 42-year-old African woman under rheumatology for management of multisystem systemic lupus erythematosus. She had pre-existing type 2 diabetes which was initially managed with metformin but more recently was starting to require basal bolus insulin regime for worsening control. On examination, she was slim, had mild acanthosis nigricans and no signs of androgen excess. During admission she had persistent glucotoxaemia, with insulin requirements in excess of 8 U/kg/day. Despite this, her blood glucose remained persistently elevated and at times were unrecordable. She remained remarkably well and never developed ketonaemia during admission.

Due to her persistent profound hyperglycaemia, fasting insulin, C-peptide and glucose were analysed. Insulin and C-peptide levels were elevated (2172 pmol/L and 368 pmol/L, respectively) with a concurrent fasting blood glucose of 8.3 mmol/L, confirming extreme hyperinsulinaemia. A diagnosis of insulin resistance was considered: insulin antibodies were not detected; however analysis of serum by immunoprecipitation and western blotting confirmed the presence of insulin receptor blocking antibodies and adiponectin level of 17.7 µg/ml. She was started on cyclophosphamide intravenously along with continuous glucose monitoring. Her blood glucose started to improve following second dose of cyclophosphamide and after receiving six infusions she has not required any more insulin. The goal of therapy for our patient with confirmed type B insulin resistance was to reverse the hypercatabolic state with high doses of insulin, and eliminate the autoantibodies with immunosuppressive therapy.