

Endocrine Abstracts

February 2018 Volume 53
ISSN 1479-6848 (online)

Obesity Update

1 February 2018, Royal College of Physicians, London, UK



published by
bioscientifica

Online version available at
www.endocrine-abstracts.org



Obesity Update

1 February 2018, Royal College of Physicians,
London, UK

Programme Organising Committee

Doctor Barbara McGowan (Programme Chair)

Professor Nick Finan

Professor John Wilding

Professor Kevin Murphy

Professor Rachel Batterham

Doctor Tricia Tan

Doctor Rob Andrews

Doctor Shahrads Taheri

Obesity Update 2018 Endorsements:

Society for Endocrinology

Association for the Study of Obesity

CONTENTS

Obesity Update

Speaker Abstracts

A year in review: what are the highlights?	OU1–OU3
Plenary 1: Corpulence as a disease: from Hippocrates, to ‘the other’ William Harvey and to today	OU4
Debate: Will metabolic surgery replace pharmacotherapy for the treatment of t2 diabetes?	OU5–OU6
Symposium: Obesity in Pregnancy	OU7–OU8
Plenary 2: The neurology circuitry of appetite	OU9

Oral Communications

Case Discussions: complex clinical cases 1.0	CD1.1–CD1.4
Case Discussions: complex clinical cases 2.0	CD2.1–CD2.3

Poster Presentations	P01–P09
---------------------------------------	---------

INDEX OF AUTHORS

Speaker Abstracts

A year in review: what are the highlights?

OU1

Abstract unavailable.

OU2

Novel therapies for obesity – an update

Tricia Tan

Imperial College Healthcare NHS Trust, London, UK.

Obesity surgery is not a scalable solution for obesity and diabetes. Options for pharmacotherapy are sorely required because there will be patients who cannot and will not have surgery, or perhaps will require a ‘bridge’ to surgery. Although oral agents such as Orlistat and Bupropion/Naltrexone are marketed in Europe, these treatments suffer from considerable side effects that limit their appeal and efficacy. Gut hormone treatments, exemplified by high-dose Liraglutide (Saxenda) and Semaglutide, are now coming into the market. These take advantage of physiological satiety and metabolic pathways. However, even high-dose Liraglutide has limited efficacy and there is a significant percentage of patients who do not respond. This presentation will look at the concept of multiple/combination gut hormones as practicable treatments for diabetes and obesity.

DOI: 10.1530/endoabs.53.OU2

OU3

Metabolic surgery and mental health – what’s new

Samantha Scholtz

West London Mental Health Trust and Imperial College London, London, UK.

We review the year’s developments in the field of psychological support and assessment of patients undergoing metabolic surgery. In the move away from the gatekeeping role of the psychiatrist or psychologist within multi-disciplinary weight management teams, we review the evidence for psychological predictors of outcome after metabolic surgery. We review the long term psychological outcomes after metabolic surgery. There is a lack of parity of metabolic surgery being offered to patients with serious mental illness, despite growing evidence that patients with serious mental illness have a high mortality rate associated with their obesity and metabolic illness. The critical need for post-operative psychological support in the light of weight regain and potential negative psychological outcomes from surgery is addressed. The evidence for effective psychological interventions, including the optimal timing and cost-effective delivery methods thereof is reviewed. The need for longer term follow up and de-emphasis on weight outcomes in trials is highlighted.

DOI: 10.1530/endoabs.53.OU3

Plenary 1: Corpulence as a disease: from Hippocrates, to ‘the other’ William Harvey and to today

OU4

Abstract unavailable.

Debate: Will metabolic surgery replace pharmacotherapy for the treatment of t2 diabetes?

OU5

Abstract unavailable.

OU6

Metabolic surgery in a pill?

Carel le Roux

Diabetes Complications Research Centre, Conway Institute, University College Dublin, Dublin, Ireland.

Bariatric surgery has had to change its name because as a ‘weight loss treatment’ it was far less successful than as a ‘health gain treatment’. The focus now is on metabolic surgery and no longer on just reducing kilograms but rather on improving organ function. The organs that appear to benefit most are those damaged by the combination of type 2 diabetes and excess adipocytes. At the heart of success of surgery is the significant gut adaptation which then drives multiple visceral signals. At the same time there has been improvements in nutrition, medicines and medical devices interventions for metabolic control. The question now arise whether we can do ‘knifeless surgery’ and still get all the benefits we have become accustomed to? We know that metabolic surgery can acutely improve health and maintain the health benefits for decades. At the same time we have seen improvements in nutritional science, medication, and medical devices, but maybe we have been asking the wrong question. Maybe we shouldn’t try to achieve knifeless surgery, but instead combine all our efforts, using the knife plus nutrition plus medication plus medical devices. What we now need is to find a more personalised medicine approach in getting the right treatment or treatment combination to the right patient at the right time. The options are endless, but we still need to define what it is we really want to achieve.

DOI: 10.1530/endoabs.53.OU6

Symposium: Obesity in Pregnancy

OU7

Abstract unavailable.

OU8

Pregnancy after Bariatric surgery

Jill Shawe

Plymouth University, Plymouth, Devon, UK.

Obesity in women is linked to a number of adverse reproductive outcomes including anovulation, delayed time to conception, increased rate of miscarriage,

and complications during pregnancy and birth. Bariatric surgery (BS) is an effective treatment for the management of obesity and its complications such as type 2 diabetes. It provides sustained and significant weight loss with potential to ameliorate risk. The population undergoing BS is growing with 76% of operations in England now in women - the majority of whom are of child-bearing age. Women may specifically choose to have surgery as a means of improving their fertility as they can conceive quickly after BS. However, pregnancy soon after BS has the potential for surgical complications, nutritional deficiencies and poor fetal outcomes. There are no national guidelines regarding the management of this high-risk group (post-surgery, pre-conception). Current practice advice, such as the recommendation to wait at least 18 months after surgery before conceiving, lacks a robust evidence base and, in not reflecting the needs and lifestyles of the women, is failing to influence their behaviour. A European partnership is currently undertaking systematic review and expert consensus to formulate clinical guidelines. In addition, longitudinal cohort studies are underway to establish effects of surgery on fertility, maternal and fetal outcomes and optimal management for preconception health, nutrition and pregnancy following surgery.

DOI: 10.1530/endoabs.53.OU8

Plenary 2: The neurology circuitry of appetite

OU9

The neural circuitry of appetite

Kevin Murphy
Imperial College, London, UK.

Understanding the physiological control of appetite is crucial to our understanding of obesity and metabolic disease, and may suggest novel targets for anti-obesity drugs. In the last decade our understanding of the mechanisms by which the brain regulates energy homeostasis has improved dramatically, largely due to new techniques in neuroscience including optogenetics and chemogenetics. This talk will summarise our current understanding of the neural circuitry that regulates food intake, and how separate circuits have been identified that appear to regulate food-seeking behaviour and consummatory behaviour, and to mediate the effect of peripheral signals driving meal termination. A better understanding of these systems and new ways of accurately capturing food intake data in humans may suggest novel behavioural and pharmacological approaches to weight management.

DOI: 10.1530/endoabs.53.OU9

Oral Communications

Case Discussions: complex clinical cases 1.0

CD1.1

A novel way to manage obesity in a patient with poorly controlled Addison's disease

Chinnadorai Rajeswaran, Simon Holmes, Vinod Joseph & Ahmed Hanafy
Mid-Yorkshire Hospitals NHS Trust, Wakefield, UK.

Introduction

The reason for weight gain is multifactorial. Effective intervention can only be incorporated if the underlying cause is evaluated correctly. Here we present a lady with Addison's disease who gain significant weight and was helped to lose weight using a novel approach.

Case-Report

42 year-old lady was referred to our weight-management service as she was unsuccessful in losing weight. Detailed evaluation in the obesity clinic revealed that she had poorly controlled Addison's disease for 4 years. She complained of excessive tiredness, hair loss, nausea, vomiting and several unexplained collapses. Following each collapse, she increased her steroid dose. At time of first visit, she was taking on an average Hydrocortisone (HC), 100 mg a day. As a result, she had gained 26 kg in 6 months. On clinical examination, her weight was 93.8 kg with BMI of 38.01 kg/m². She had no abnormal pigmentation and there was no postural drop of blood pressure. She was not cushingoid. Resting ECG, 7-day event recorder, EEG and urinary catecholamines were all within normal limits. In view of recurrent collapses and the fact she was feeling better with injectable HC she was taking during her collapses, we commenced her on continuous subcutaneous hydrocortisone infusion via pump. The dose and rate of HC infusion was adjusted according to hydrocortisone day curve and she is now on HC 20.8 mg/day. She has lost 25 kg since she has been on HC pump. She no longer experiences any collapses and her quality of life has significantly improved.

Discussion

Over-replacement of hydrocortisone in patients with adrenal insufficiency can result in significant weight gain. Continuous subcutaneous hydrocortisone injection via pump allows clinician to mimic near physiological cortisol levels. It also helps to overcome problems with malabsorption if any. People with Addison's disease are not active due to tiredness. This mode of delivery of HC ensures adequate replacement and increases their confidence and activity levels.

Conclusion

Hydrocortisone pump could be considered in a patient with poorly controlled Addison's disease requiring large doses of HC. The pump not only delivers appropriate HC but also prevents weight gain.

DOI: 10.1530/endoabs.53.CD1.1

CD1.2

The clinical course of obesity in a patient with missed Cushing's disease following Roux-en-Y gastric bypass then trans-sphenoidal surgery

James Crane

Guy's and St Thomas' NHS Foundation Trust, London, UK.

Case History

A 26 year old female underwent Roux-en-Y gastric bypass (RYGB) surgery for intractable peptic ulcer disease on a background of obesity. She had a history of 40kg weight gain over 8 years (weight 123 kg, BMI 41.1 kg/m²), hypertension, depression, insomnia and newly diagnosed type 2 diabetes. Following surgery, weight loss was disappointing (nadir 112 kg, -11 kg, -8.9%TBW, -22.9%EBW, BMI 37.5 kg/m²) and diabetes and hypertension failed to remit. She developed chronic abdominal pain and her psychiatric condition worsened with episodes of self harm. On review in the medical clinic, violaceous striae and proximal myopathy prompted investigation. Endocrine investigations (LDDST and IPSS) led to a diagnosis of ACTH-dependent (pituitary) Cushing's.

Intervention

Trans-nasal, trans-sphenoidal hypophysectomy (TSS), May 2017. Her weight on day of surgery was 121 kg. Excised tissue was histologically confirmed as corticotroph adenoma.

Post-op investigation results

Day 1 and 2 post-op morning cortisol results of <30 nmol/l were strongly indicative of curative surgery, she was discharged on hydrocortisone 10 mg BD. Subsequent insulin tolerance testing (nadir glucose 1.9 mmol/l, peak cortisol 8 nmol/l, peak growth hormone 0.67 mcg/l) indicated pituitary-adrenal and growth hormone insufficiency. Baseline biochemical tests indicated intact pituitary-gonadal and thyroid axes.

Post-op clinical results

7 months post TSS, her hypertension and diabetes is in remission. Her weight has dropped from 121 to 97 kg (-24 kg, -19.8%TBW, -52.2%EBW). Her chronic abdominal pain has improved, though she has required intensive psychiatric input to stabilise her anxiety-depression following a deliberate self-poisoning episode. She was admitted with Addisonian crisis (despite professed adherence to hydrocortisone). This episode and symptomatic fatigue/malaise on attempts to reduce her glucocorticoids have resulted in a hydrocortisone dose requirement of 35 mg/day.

Discussion

This case illustrates the perils of a missed diagnosis of secondary obesity and the powerful effect of glucocorticoids on appetite and weight. Her experience on hydrocortisone replacement raises the possibility that her gastric bypass procedure is impairing absorption of hydrocortisone and increasing the risk of Addisonian crisis.

DOI: 10.1530/endoabs.53.CD1.2

CD1.3

Early screening for gestational diabetes in obese pregnant women is associated with improved neonatal and maternal outcomes

David Ryan¹, Laura Haddow¹ & Rebecca Reynolds²

¹Edinburgh Medical School, Edinburgh, UK; ²Centre for Cardiovascular Science, Queen's Medical Research Institute, University of Edinburgh, Edinburgh, UK.

Gestational Diabetes (GDM) complicates 3–5% of all UK pregnancies but prevalence is increasing with rising rates of maternal obesity. Adaptions to the GDM screening protocol within NHS Lothian in August 2016 to screen high-risk women including women with obesity (BMI ≥ 30 kg/m²) during early pregnancy (approximately 10 weeks gestation) allowed us to test the hypothesis that early screening of obese pregnant women would be associated with improved maternal and neonatal outcomes. We conducted a retrospective clinical audit among all women with a singleton pregnancy diagnosed with GDM and delivering their baby at Royal Infirmary Edinburgh, from January 1st 2015 to 31st October 2017. 351 (66%) women were diagnosed using the pre-August 2016 pathway (protocol 1) while 180 (34%) were diagnosed using the early screening protocol (protocol 2). Data were extracted from NHS Lothian's electronic records to investigate effects of protocol 2 on GDM management and outcomes according to maternal BMI. 59.7% of women (n=317) diagnosed with GDM were obese. Obese had higher rates of adverse primary outcomes (composite of emergency caesarean section, macrosomia, and neonatal hypoglycaemia, P<0.05) and neonatal complications (P<0.05). Obese in protocol 2 were diagnosed earlier (143.5 (59.3) vs 184.5 (48.7) days of gestation, P<0.001), spent more time on diet therapy (63.5 (60.4) vs 46.9 (40.6) days of gestation, P<0.05) and started metformin earlier (182.4 (51.0) vs 204.1 (45.7) days of gestation, P<0.05) compared to obese diagnosed with protocol 1. There was no associated increase in the duration of insulin therapy. Obese diagnosed with protocol 2 had a significant reduction of adverse primary outcomes compared to obese diagnosed using protocol 1 (n=36 (33.0%) vs n=96 (46.4%), P<0.05), neonatal complications (n=37 (33.9%) vs n=97 (46.6%), P<0.05) and maternal complications (n=59 (54.1%) vs n=141 (67.8%), P<0.05). Obese pregnant women represent a high-risk cohort within the GDM population. Early glycaemic screening is associated with improvements in maternal and neonatal outcomes for an obese cohort. This could be mediated by reduced gestational weight gain, increased duration of lifestyle interventions or more interactions with healthcare professionals.

DOI: 10.1530/endoabs.53.CD1.3

CD1.4

The impact of a specialist weight management service on symptoms of depression: a retrospective service evaluation project

Esme Ingram¹, Anjali Zalin¹, Charlotte Quarrie², Michelle Wilson², Rhian Davies², Ruth Kent², Kevin Shottliff¹, Veronica Greener¹ & Lucy Turnbull²

¹Beta Cell Unit, Chelsea and Westminster Hospital NHS Foundation Trust, London, UK; ²Kensington and Chelsea Specialist Weight Management Service, Central London Community Healthcare, London, UK.

Background

Obesity is associated with complex multisystem pathology and significant psychosocial burden. Yet, despite its increasing prevalence, the commissioning of Specialist Weight Management Services remains limited.

Methods

Retrospective service evaluation of a proportion of patients ($n=179$) engaging with the Central London Community Healthcare Specialist Weight Management Service for at least 6-months from 2012 onwards. Outcome measures, including weight, Body Mass Index (BMI), blood pressure, HbA1c, Epworth Sleepiness Scale (ESS) and measures of quality of life (EQ-5D-3L) and anxiety and depression (GAD7, PHQ9) were collected at baseline and then at follow-up.

Results

Engagement in this Specialist Weight Management Service was associated with significant improvements in PHQ-9 score (mean reduction 2.9, $P=0.001$) and physical activity (mean increase of 12.5 repetitions, $P=0.001$) between baseline and follow-up. There was also a significant reduction in mean weight (2.9 kg, $P=0.000$) between baseline and follow-up.

Conclusions

These findings provide further evidence to support the efficacy and commissioning of multi-disciplinary Specialist Weight Management Services, not only in outcomes of weight loss but also in psychological wellbeing and physical activity.

DOI: 10.1530/endoabs.53.CD1.4

Case Discussions: complex clinical cases 2.0**CD2.1****Eating behaviour and psychological relationship to food following Roux-en-Y Gastric bypass surgery or VLCD intervention: insights into mechanisms of sustained weight loss**

Haya Alessimii¹, Belén Pérez-Pevida¹, Samantha Scholtz², Julia Kenkre¹, Chedie Doyle¹, Ahmed Ahmed², Sanjay Purkayastha², Alexander D Miras¹, Harvinder Chahal² & Tricia Tan¹

¹Section of Investigative Medicine, Division of Diabetes, Endocrinology and Metabolism, Imperial College London, London, UK; ²Imperial Weight Centre, St Mary's Hospital London, Imperial College NHS Healthcare Trust, London, UK.

Introduction/Aims

Currently, the most successful long term treatment for obesity is bariatric surgery, however the underlying mechanisms are not fully understood. Changes in gastrointestinal and central neuroendocrine signalling have been postulated as mediators of psychological and eating behaviour changes following bariatric surgery. We aimed to investigate changes in eating behaviour and psychological factors pre- and 1 month post-very low calorie diet (VLCD) and 3-month post Roux-en-Y gastric bypass surgery (RYGB).

Methods

Prospective study of 22 obese diabetic subjects recruited through the Imperial Weight Centre. 15 questionnaires classified into psychological factors, personality traits, eating behaviours, food hedonics, health-related quality of life and alcohol use, were completed by patients pre- and post-intervention. Results were analysed using two-way ANOVA followed by post-hoc analysis using the Bonferroni method. Data presented as mean \pm standard deviation.

Results

- VLCD group: 11 subjects (5 females) with BMI 39.4 ± 5.2 kg/m² and age 51.5 ± 9.0 year.
 - Increase in restraint scores ($P=0.0002$).
- RYGB group: 11 subjects (9 females) with BMI 40.4 ± 4.3 kg/m² and age 46.4 ± 13.4 year.
 - Healthier eating patterns characterised by a reduction in eating in response to emotional and external food-related stimuli ($P=0.0012$) and reduced desire and impulsivity for novel rewards ($P=0.0352$)
 - Improvement in Physical Functioning ($P=0.0625$) and pain ($P=0.0424$)
 - Trend towards the improvement in anxiety and depression scales ($P=ns$)
- No significant changes were found in alcohol following either intervention.

Conclusions

Quality of life improvement and eating behavioural changes were seen post-RYGB in contrast with the VLCD group, emphasising the effectiveness of surgical intervention in ameliorating obesity-related symptoms whilst providing substantial, long-lasting weight-loss effects. There was no significant change in psychological characteristics, food hedonics and alcohol use, although the study may have been underpowered to detect this. The changes in eating behaviour may be an important contributor to long term weight maintenance after RYGB. The increase in restraint among post-VLCD patients warrants further research using longer-term studies.

DOI: 10.1530/endoabs.53.CD2.1

CD2.2**Poor responsiveness after bariatric surgery: clinical and eating behaviour characteristics**

Belen Pérez-Pevida¹, Madhawi Aldhwayanand¹, Rachel Gibson¹, Samantha Scholtz¹, Alexander D Miras¹, Emma McGlone¹, Anna Kamocka¹, Omar Khan², Veronica Greener³, Barbara McGowan⁴, Francesco Rubino⁵, Steve Bloom¹ & Tricia Tan¹

¹Section of Investigative Medicine, Division of Diabetes, Endocrinology and Metabolism, Imperial College London, London, UK; ²St George's University Hospitals NHS Foundation Trust, London, UK; ³Chelsea and Westminster Hospital NHS Foundation Trust, London, UK; ⁴Guy's and StThomas' NHS Foundation Trust, London, UK; ⁵King's College London and King's College Hospital, London, UK.

Background

Bariatric surgery has been proven to produce substantial weight loss and amelioration of metabolic syndrome-associated co-morbidities. However, at five-year follow-up, only 20–40% of patients maintain diabetes remission and 40% of patients return to their baseline weight. The limiting factor in treating refractory diabetes following obesity surgery is the lack of knowledge about its aetiology.

Aims

Evaluate the eating pattern and clinical characteristics of poor responders after bariatric surgery enrolled in the Gravitax Trial (The GLP1 Receptor Agonist interVentlon for poor responders afTer bariAtric Surgery. EudraCT Number 2014-003923-23).

Methods

Cohort study of 52 patients defined as poor responders after sleeve gastrectomy (SG) and Roux-en-Y gastric bypass (RYGB) surgery. Poor response was defined as failure to achieve diabetes remission (HbA1c >48 mmol/l). The DEBQ was used to assess the presence of restrained, emotional and external eating behaviour.

Results

All data is presented as mean \pm s.d. 52 patients, 35 (67%) were women, aged 52.4 ± 9.7 year. 7 VSG and 44 RYGB. HbA1c was 57 ± 9 mmol/mol and HOMA-IR: 4.6 ± 5.0 . BMI was 36.1 ± 7.0 kg/m². Patients were followed up for 4.9 ± 2.5 year. There was a weight loss of $32.2 \pm 18.9\%$ and weight regain from the lowest weight after surgery of 10.0 ± 7.9 kg. Significant positive correlation between weight regain and time post-surgery ($r=0.33$; $P=0.018$). Diabetes duration was 17.2 ± 7.4 years with a post-surgical reduction of HbA1c of -20 ± 17 mmol/mol. There was no change in number of oral glucose-lowering agents pre vs. post surgery. However, the proportion of patients on insulin pre vs. post was reduced (65% vs. 30%). Significant correlation between %weight loss and HbA1c change ($r=0.524$; $P=0.021$). No significant difference in weight regain was seen between VSG vs RYGB. With regards to eating behaviour, significant correlation was found between weight regain and emotional eating ($r=0.43$; $P=0.005$). Gender difference in restraint were seen (men had significantly less self-control towards food than women, $P=0.033$).

Conclusions

A correlation between emotional eating and weight regain after bariatric surgery was observed. A prospective study is needed to confirm this link.

DOI: 10.1530/endoabs.53.CD2.2

CD2.3**Surgical revision of candy cane after Roux-en-Y gastric bypass (RYGB)**

Anna Kamocka, Emma Rose McGlone, Belen Perez Pevida, Sanjay Purkayastha, Krishna Moorthy, Sherif Hakky, Harvinder Chahal, Christos Tsironis, Alexander Miras, Tricia Tan & Ahmed Ahmed Imperial College, London, UK.

Introduction

An excessively long blind-end of the alimentary limb following RYGB, known as a 'candy cane' (CC), may cause symptoms such as pain, gastrointestinal symptoms and weight regain. Very few studies have examined the efficacy of surgical resection of the CC. We aimed to assess symptom resolution following CC surgery.

Methods

Single centre observational study of 28 CC revisions from 2010 to 2017 (mean age 45 ± 8 , female preponderance 9:1). Mean time between RYGB and revision was 40 ± 27 months with post-revision follow-up time of 21 ± 15 months. Patients who underwent any other major operative intervention at the same time as CC revision were excluded. Perioperative and follow-up data were analysed. Statistical analysis was performed using SPSS v.20.

Results

Symptoms leading to revision were pain (82%), weight regain (43%), regurgitation/vomiting (40%), acid reflux (18%). Barium swallow and OGD

performed in 24 cases revealed a false negative rate of 33% (8/24) and 50% (12/24) respectively. Patients with pain had significantly higher CC size as compared with pain-free group (4 vs 2 cm; $P=0.037$). There was no correlation between CC size and weight regain or gastrointestinal symptoms. Complete symptom resolution was documented in 27%, partial in 35%, no improvement in 38%. Complications were recorded in 25% (Clavien-Dindo classification: 11% Grade 1, 14% Grade 3b). Median length of stay was 0 days (0–5).

Conclusion

CC surgery results in symptom resolution or improvement in two thirds of cases but as with all revisional surgery, carries a risk of complications. Its diagnosis may frequently be missed; hence more than one diagnostic tool should be considered when investigating symptomatic patients after RYGB.

DOI: 10.1530/endoabs.53.CD2.3

Poster Presentations

P01**The acute effects of propionate on resting energy expenditure and fat oxidation in healthy human volunteers**Karen Aspey¹, Edward Chambers² & Gary Frost²¹Imperial College London, London, UK; ²Nutrition and Dietetic Research Group, Section of Investigative Medicine, Faculty of Medicine, Hammersmith Campus, Imperial College London, London, UK.

Short chain fatty acids (SCFAs), including propionate, are the main metabolic by-products in the fermentation of non-digestible dietary fibre by the gut microbiota. SCFAs have wide-ranging effects *in vivo*, and their receptors, free fatty acid receptor 2 (FFAR2) and free fatty acid receptor 3 (FFAR3), are expressed at numerous tissue sites. Sodium propionate supplementation has been shown to increase energy expenditure, induce sympathetic neuron action potentials and protect against diet-induced obesity in murine trials. The raised energy expenditure has been accompanied by increased rates of whole-body lipid oxidation. Observations in humans are currently lacking, therefore, the objective of the present study was to investigate the effects of oral sodium propionate supplementation on resting energy expenditure (REE) and lipid oxidation in healthy human volunteers. 18 volunteers (Age: 25 ± 1 y; Body Mass Index 24.1 ± 1.2 kg/m²) were recruited for this randomised, double blind, placebo-controlled, crossover trial. Volunteers received either 6.8 g sodium propionate (Propionate) or 4.2 g sodium chloride (Placebo) capsules following an overnight fast during two standardised 180 min study visits. Indirect calorimetry was used to measure REE, respiratory exchange ratio (RER) and substrate oxidation rates. Levels of circulating propionate were higher in the Propionate trial at 180 min compared with Control (3.04 ± 0.26 vs 5.25 ± 0.65 µmol/l; *P* = 0.005). Propionate increased mean REE (1.25 vs 1.30 kcal/min; *P* = 0.036). This effect was seen in conjunction with a reduction in mean RER (0.88 ± 0.02 vs 0.85 ± 0.02; *P* = 0.040) and corresponding increase in mean whole-body lipid oxidation rates (0.037 ± 0.009 vs 0.049 ± 0.009; *P* = 0.048) over 180 min. The present study observed that oral sodium propionate supplementation increases REE via an increase in lipid oxidation in humans, corroborating findings in animal trials. In humans, >90% of propionate absorbed from the gut lumen undergoes hepatic metabolism, thus it is plausible that these observed effects were primarily due to an increase in hepatic lipid oxidation. Future work may utilise hepatic MR spectroscopy, to investigate the long-term effects of propionate administration on hepatic metabolic processes.

DOI: 10.1530/endoabs.53.P01

P02**Predictive value of distress tolerance measures in successful weight loss**Daisy Thompson-Lake¹, Emma O'Byrne¹, Richard De La Garza II² & Peter Hajek¹¹Queen Mary University, London, UK; ²Baylor College of Medicine, Houston, TX, USA.**Background**

Distress tolerance (DT) has been proposed as a possible contributor to the ability to successfully adhere to difficult behaviour changes, such as stopping problematic substance and cigarette use. A number of measures of DT have been used in attempts to predict behaviour change outcomes. Findings however, have been inconclusive and no one measure has shown consistent results. Importantly, no work has yet assessed the predictive value of DT measures in successful weight loss.

Aims

To identify individuals at the extreme ends of the successful (*N* = 34) and unsuccessful (*N* = 34) weight loss continuum to see if DT measures differentiated between the two groups. Additionally, to examine associations between measures of DT and a battery of life stress measures.

Results

A self-report measure of DT discriminated between the successful-unsuccessful subgroups, but a logistic regression model demonstrated a low predictive power of 68% for this measure (*P* = 0.02, odds ratio = 1.8, 95% CI = 1.1–3.3). No DT measures previously found to be predictive in alcohol, substance use or cigarette smoking were predictive of weight loss success. Loneliness and depression symptoms differed between the subgroups (*ps* < 0.05) and showed associations with the self-report DT measure (*ps* < 0.001).

Conclusions

Links between the DT measure and successful behaviour change were only modest. DT may not be a major contributor to successful weight loss or the

existing measures do not assess it well. Loneliness and depression are related to unsuccessful attempts at behaviour change but the direction of the relationship requires further clarification.

DOI: 10.1530/endoabs.53.P02

P03**Clinical effectiveness of SGLT2-I in combination with GLP-1 agonists as alternative or adjunct to bariatric surgery in type 2 diabetes mellitus**

Suhaniya Samarasinghe, Sophie Hickling, Camilla Lyttle, Micheal Feher & Veronica Greener

Chelsea and Westminster NHS Foundation Trust, London, UK.

Effective management of obesity is increasingly challenging with the continued growth of the nation's waistlines and bariatric surgery is not the always the answer to this problem. The synergistic action of GLP-1 agonists (GLP1A) and SGLT2 inhibitors (SGLT2I) represents a possible therapeutic approach for patients with Type 2 diabetes (T2DM) and obesity in whom bariatric surgery has been ineffective or is not possible. A single centre retrospective study was performed to assess weight and metabolic response to the combination of GLP1 and SGLT2 inhibitors in patients with T2DM. The cohort consisted of 25 patients with T2DM and BMI > 35 kg/m², aged 35–76, 12 male and 13 female, and duration of treatment was 3–29 months (median 10 months). Eight had unsuccessful bariatric surgery 2–12 years previously and none had achieved remission from T2DM. 17 patients were not able to have or did not want surgery.

Results
In total seven out of 25 patients (28%) achieved an HbA1c of < 48 mmol/mol and weight reduced by a median 7% (4–28%). BMI reduced by median 9% (–2 to 26%) and HbA1c reduced by 20 mmol/mol (6–105). Due to the small sample size, non-parametric testing was used to compare weight, BMI and HbA1c before and after combination treatment. Statistically significant differences were detected in BMI (*P* = 0.00001) and HbA1c (*P* = 0.00001) but not weight (*P* = 0.158). Augmented individual responses were seen; one lost 31 kg with 105 mmol/mol reduction in HbA1c having lost < 5% EBW with gastric band. All patients tolerated the combination without significant side effects.

Discussion

Non-surgical weight loss approaches are limited and of the possible pharmacological treatments, only orlistat is freely available on the NHS. Particularly in T2DM, weight loss is often difficult to achieve and maintain but can have significant effects on individuals' health. This study has shown that in this cohort, GLP1A and SGLT2I provide an effective and well tolerated combination to encourage weight loss and improve glycaemic control in individuals in whom previous bariatric surgery had been unsuccessful or was not possible.

DOI: 10.1530/endoabs.53.P03

P04**Impact of a diabetes specialist nurse in a tier 3 specialist weight management service on improvement on weight and glycaemic control**

Stephanie Goodman & Vijayarajan Arutchelvam

South Tees NHS Foundation Trust, Middlesbrough, UK.

The specialist weight management service (SWMS) is a tier 3 service offered to patients who meet a criterion of raised BMI with or without comorbidities. It is a multi-disciplinary service made up of physician, GPwSI, dietitians, physiotherapist, psychologists and health trainers. Approximately 40% of the patient within the service has type 2 diabetes. As part of a quality improvement pilot study a diabetes specialist nurse was introduced to the team. Patients were seen in an initial MDT with the diabetes nurse present. Changes to medication would be made at this MDT and followed up after 2–4 weeks by the nurse. Regular appointments with the nurse were arranged after this on an individualised basis. Over a period of 10 months the diabetes specialist nurse saw 133 patients. 65 were female and 68 were male. The age range was 22–74 years (mean age 52.9 years). Their starting HbA1c was measured as part of the referral to SWMS this was then repeated after 4 and 8 months within the service. 24% of the data is missing due to patients been in the service less than 4 months or leaving the service. Of the available data 89% of patients maintained or improved their HbA1c. 58% of patients improved by at least 5 mmol. 45% improved by at least 10 mmols. 23% improved by at least 20 mmol and 9% improved by at least 30 mmols. Three

patients were identified as making significant improvements. Patient 27 lost 10.4 kg in weight in 4 months and reduced their HbA1c by 76 mmol. Patient 67 lost 15.8 kg in weight in the 10 months and reduced their HbA1c by 59 mmols and patient 126 lost 8.2 kg in weight in 4 months and reduced their HbA1c by 55.
DOI: 10.1530/endoabs.53.P04

P05

Extreme weight loss post-gastric bypass in a recently diagnosed diabetic – the honeymoon trap

Christopher Philbey & Kamrudeen Mohammed
Hull Royal Infirmary, Hull, UK.

Introduction

Clinicians are hopeful for substantial weight loss after surgical intervention for obesity, with the funding decisions relatively easier to achieve in those with diabetes, there is a significant proportion of these patients undergoing procedures. In contrast to most outpatient encounters, a 20 kg drop in weight is looked upon favourably between follow-ups where it would have risen the spectre of pathology elsewhere. We present the following case that illustrates an unexpected pitfall.

Case

51 year old male with a weight of 162 kg (BMI 49) is diagnosed with type 2 diabetes mellitus (T2DM). He has no medical history besides a son with Addison's. He is started on metformin therapy and referred to the local obesity team for weight management. His diabetic control is proving difficult and he has had a rapid treatment intensification with sulphonylureas, SGLT2 inhibitors and GLP-1 agonists. After 18 months, he undergoes a Roux-en-y Gastric Bypass. The operation proceeds successfully. On first review, his weight has dropped to 140 kg (BMI 42) and the team is pleased with the improvement in his weight. 12 months later and he has left his previous area. At his first appointment in our Diabetes centre he weighs 92 kg (BMI 28) with a HbA1c of 86. His weight loss of 70 kg in 18 months has suspiciously had no benefit on his diabetes control. He is started on basal Lantus. His HbA1c continues to rise thus he was switched to the longer-acting toujeo. There is a supply issue and his lantus runs out two days before his toujeo can start. He is admitted in euglycaemic ketoacidosis. Diabetes associated antibodies are tested. All are strongly positive. He is treated for type 1 diabetes mellitus (T1DM).

Discussion

We present this case to highlight that weight loss post-gastric intervention in the diabetic population can be a pathological presentation of type 1 diabetes. A "honeymoon" T1DM can easily be mistaken for a T2DM. The authors would recommend formal testing for type 1 diabetes if a post-operative patient with a family history of autoimmune disease a) experienced rapid and sustained weight loss and b) required frequent diabetic treatment intensification.

DOI: 10.1530/endoabs.53.P05

P06

Our experience in managing disabling hypoglycaemia post-gastric bypass surgery

Ahmed Hanafy¹, Misbah Mohammad¹, Sabari Anand Haridass² & Chinnadorai Rajeswaran¹

¹The Mid-Yorkshire Hospitals NHS Trust, Wakefield, UK; ²Leeds Teaching Hospitals, Leeds, UK.

Introduction

Prevalence of obesity is increasing worldwide. As a consequence the number of people undergoing bariatric surgery is also on the rise. Hypoglycaemia is increasingly seen in patients who have undergone gastric bypass surgery and we have successfully managed most of them. Here we describe our experience in dealing with one of the patients with disabling hypoglycaemia.

Case-report

A 35-year-old woman with BMI of 41.87 kg/m² had Roux-en-Y gastric bypass. She lost six stones following her surgery but started to develop symptoms of hypoglycaemia after 15 months. She sustained several injuries during episodes of hypoglycaemia and had frequent hospital admissions for collapse. She was commenced on low glycaemic index food and several medications including acarbose, diazoxide followed by octreotide were tried. None of these measures helped resolve the disabling hypoglycaemia. She therefore had a battery of investigations including short synacthen test (SST), pituitary function tests,

chromogranin A, 5-HIAA, anti-insulin antibody, insulin, C-peptide, IGF2: IGF1 ratio, Urinary sulphonylurea screen, Octreotide scan, MRI Pancreas and pituitary. Her insulin and C-peptide were inappropriately elevated. Rest of the investigation were within normal limits. Mixed meal test ruled out reactive hypoglycaemia. She had 68Ga DOTANOC whole body PET scan, which showed no evidence of somatostatin receptor positive disease. Insertion of a PEG tube to feed did not help. As a last resort, she had a laparoscopic reversal of her gastric bypass. She has not experienced any severe hypoglycaemic episodes following discharge.

Discussion

Managing hypoglycaemia following gastric bypass surgery can be challenging. Although dumping syndrome is a common cause, other causes like adrenal insufficiency and insulinoma should be considered. In our case the patient had marked increase in insulin and C-peptide, which might reflect an exaggerated response of carbohydrate intake. Reversal of bypass should be the last resort if disabling hypoglycaemia persists despite conservative management. Exendin 9–39, could be considered, when commercially available before considering reversal of bypass.

Conclusion

A systematic approach is needed when investigating and managing hypoglycaemia following bariatric surgery.

DOI: 10.1530/endoabs.53.P06

P07

The use of ketogenic diet in a patient with post-prandial hyperinsulinemic hypoglycaemia after m Roux-en-Y Gastric Bypass surgery: a case study

Sally Abbott^{1,2}, Naomi Dindol^{1,2}, Rishi Singhal^{1,2}, Ahmed Helmy¹, Mohamed Ahmed¹, Sri Bellary^{1,3} & Abd Tahrani^{1,2}

¹Heart of England NHS Foundation Trust, Birmingham, UK; ²University of Birmingham, Birmingham, UK; ³Aston University, Birmingham, UK.

Background

Hyperinsulinemic hypoglycaemia (HH) after Roux-en-Y gastric bypass (RYGB) is rare. Patients typically present with post-prandial hypoglycaemia > 1 year after surgery and once weight loss has plateaued. Despite multiple treatment options, the management of these patients remains challenging.

Clinical case

A 31-year-old female was referred for bariatric surgery with a BMI of 41.4 kg/m². In the year preceding the referral to bariatric surgery she attended tier 3 services and managed to lose 29% of her body weight with life style intervention. She was known to have Type 2 diabetes, which was now well controlled with metformin (HbA1c 34 mmol/mol) following this weight loss. Twelve months after undergoing RYGB, her BMI had reduced to 25.5 kg/m² and she presented with excessive sweating, headaches, palpitations and hunger. At this point she had lost 56% of her total body weight over a 30-month period. Two 16-h fasting tests did not elicit any proven hypoglycaemia. She was admitted as an inpatient for a 72-h fasting test, during which the lowest glucose level was 3.9 mmol/l, which was associated with insulin levels of < 10 mU/l and C-peptide of 284 pmol/l. An endoscopic ultrasound showed no evidence of pancreatic tumours. A mixed meal test was then performed which showed hypoglycaemia (glucose 2.6, and 2.8 mmol/l) with inappropriate levels of Insulin (51 mU/l) and C-peptide (1056 pmol/l) 30 min post-prandial. She remained highly symptomatic despite dietary measures (small frequent meals, avoiding simple carbohydrates), and treatment with Acarbose. Hypoglycaemic events remained frequent despite a very low carbohydrate diet (< 30 g per day). A restrictive dietary intervention using a ketogenic diet was thus initiated. The patient's symptoms resolved entirely when carbohydrate intake was reduced gradually to 10–12 g of carbohydrate per day.

Conclusion

Ketogenic dietary intervention might dramatically improve the situation in patients with post-RYGB HH that failed to respond to other measures or wish to avoid pharmacological intervention.

DOI: 10.1530/endoabs.53.P07

P08

Persistent hypoglycaemia post bariatric surgery

Tessa Glyn, Beth Greenslade & Robert Andrews
Musgrove Park Hospital, Taunton, UK.

Mrs MP was referred to the Weight Management service in 2011, aged 45. She weighed 108 kg, with a BMI of 40 kg/m². She had type 2 diabetes, but no other

past medical history and was working in a high profile job. A Roux-en-Y bypass was performed in November 2011, with no immediate complications. She successfully lost 25% of her body weight and by April 2012 weighed 79.2 kg. Towards the end of 2015 she was re-referred with symptoms of severe fatigue, poor concentration and mood changes particularly at work. As a result of this she had been signed off sick by occupational health. Investigations revealed no evidence of anaemia or vitamin deficiency, and a normal cortisol response to Synacthen. Treatment with a course of thiamine and IV Pabrinex initially improved her symptoms but they then returned. Despite denying symptoms of dumping syndrome and hypoglycemia, a decision was made to proceed with Continuous Glucose Monitoring (CGM). This revealed hypoglycaemia 2–3 h after meals. A clinical diagnosis of hyperinsulinaemic hypoglycaemia was made and she was referred to see our dietitian. Changing her diet initially improved her symptoms but they then returned. Acarbose and diltiazem were tried without success. Liraglutide significantly improved her symptoms for a number of months but the effect diminished with time. Commencement of octreotide improved her symptoms but she was still getting 5–6 hypos per week. Due to the persistence of her symptoms a CT-pancreas, 72 h fast and octreotide scan were performed ruling out an insulinoma. In early 2017 we successfully got her back to work on Prednisolone, Sitagliptin, Liraglutide and Octreotide, and with a CGM funded through exceptional funding. In the last 3 months her hypos have returned and she has had to take early retirement. Her most recent CGM download shows she spends 19% of her time with a blood glucose below 4 mmol/l and 5% below 3 mmol/l. Various options have now been discussed including trialing a dual insulin and glucagon pump or further surgery. We welcome other peoples' advice on how to manage this woman's hypoglycaemia in a bid to improve her quality of life.

DOI: 10.1530/endoabs.53.P08

P09

The forgotten tribe: severe and complex obesity patient unable to benefit from GLP-1 analogue due to HbA1c criteria – a case study

Wui Hang Cheung

North Middlesex University Hospital, London, UK.

Initial presentation

A 44 year-old Caucasian patient with severe and complex obesity and type 2 diabetes was referred to hospital diabetes clinic for optimal medication advice. Her BMI on presentation was 49 kg/m², (148 kg) and HbA1c of 7.0%. Her treatment included metformin, sulphonylurea, rapid acting insulin (total daily doses 30 unit), and long acting insulin (total daily doses 25 unit). She also suffers complications of hypertension, dyslipidaemia, osteoarthritis, and gallstone cholecystitis.

Management journey

Over the next 12 months, sulphonyuria was successfully switched to SGLT2 inhibitor therapy; through a combination of diet, exercise, and gradual withdrawal of fast acting Insulin, 13 kg weight loss was achieved (down to BMI 44 kg/m²). HbA1c remained at 7.3% or below. Patient is not prepared for bariatric surgery consideration. She did not tolerate Orlistat side effects. It was clear that further weight reduction, and possibility of withdrawing long acting Insulin, could be offered by GLP-1 analogue therapy. However our patient fall outside the low dose GLP-1 treatment criteria in HbA1c, and high dose GLP-1 treatment if currently unavailable through NHS funding.

Conclusion

A substantial population of Obesity patient with type 2 Diabetes would potential benefit from GLP-1 analogues in other important facets of their general health currently not covered by the current NICE guideline. This case highlight points of discussion and perhaps review of current guideline.

DOI: 10.1530/endoabs.53.P09

Author Index

- Abbott, S P07
 Ahmed, A CD2.1 & CD2.3
 Ahmed, M P07
 Aldhwayanand, M CD2.2
 Alessimii, H CD2.1
 Andrews, R P08
 Arutchelvam, V P04
 Aspey, K P01
- Bellary, S P07
 Bloom, S CD2.2
- Chahal, H CD2.1
 & CD2.3
 Chambers, E P01
 Cheung, WH P09
 Crane, J CD1.2
- Davies, R CD1.4
 De La Garza II, R P02
 Dindol, N P07
 Doyle, C CD2.1
- Feher, M P03
 Frost, G P01
- Gibson, R CD2.2
 Glyn, T P08
 Goodman, S P04
 Greener, V CD1.4, CD2.2
 & P03
 Greenslade, B P08
- Haddow, L CD1.3
 Hajek, P P02
 Hakky, S CD2.3
 Hanafy, A CD1.1 & P06
 Haridass, SA P06
 Helmy, A P07
 Hickling, S P03
 Holmes, S CD1.1
- Ingram, E CD1.4
- Joseph, V CD1.1
- Kamocka, A CD2.2
 & CD2.3
 Kenkre, J CD2.1
 Kent, R CD1.4
 Khan, O CD2.2
- Lyttle, C P03
- McGlone, E CD2.2
 McGlone, ER CD2.3
 McGowan, B CD2.2
 Miras, A CD2.3
 Miras, AD CD2.1 & CD2.2
 Mohammad, M P06
 Mohammed, K P05
 Moorthy, K CD2.3
 Murphy, K OU9
- O'Byrne, E P02
- Pérez-Pevida, B CD2.1
 & CD2.2
 Perez-Pevida, B CD2.3
 Philbey, C P05
 Purkayastha, S CD2.1
 & CD2.3
- Quarrie, C CD1.4
- Rajeswaran, C CD1.1 &
 P06
- Reynolds, R CD1.3
 Roux, CI OU6
 Rubino, F CD2.2
 Ryan, D CD1.3
- Samarasinghe, S P03
 Scholtz, S CD2.1, CD2.2
 & OU3
 Shawe, J OU8
 Shotliff, K CD1.4
 Singhal, R P07
- Tahrani, Abd P07
 Tan, T CD2.1, CD2.2,
 CD2.3 & OU2
 Thompson-Lake, D P02
 Tsironis, C CD2.3
 Turnbull, L CD1.4
- Wilson, M CD1.4
- Zalin, A CD1.4