12.1%, and 10.4% with class I, II, and III obesity, respectively). A total of 542 (16.7%) patients died or received hospice care, and 811 (25.0%) required ICU care. In unadjusted analyses, patients with obesity had lower mortality compared with normal weight adults (13.0% vs. 23.1%) but a higher risk of ICU care (26.5% vs. 22.5%) and longer duration of ICU stays (9.5±10.6 vs. 6.6±8.5 [days]; all p-values <0.05). Obesity was associated with a higher incidence of hypoxic respiratory failure requiring invasive (17.8% vs. 9.3%) and noninvasive (22.7% vs. 14.0%) ventilatory support. In multivariate analysis, older age, male sex, and diabetes were significantly associated with both mortality and ICU care. In contrast, obesity was not associated with a significantly higher mortality (adjusted odds ratio [OR] 1.14; 95% CI, 0.91–1.43) but was associated with a higher risk of ICU care (OR 1.27; 95% CI 1.07–1.51 for all obesity and OR 2.07; 95% CI 1.51–2.82 for class III obesity compared with normal weight). The association of underweight with mortality (OR 1.56; 95% CI 0.93 - 2.60) and ICU care (OR 1.20; 95% CI, 0.71–1.99) was not statistically significant. This retrospective study of hospitalized patients suggests that obesity is associated with intensive care use and longer duration of ICU stay but not with mortality due to COVID-19. These findings underscore the vulnerability of individuals with obesity during the current pandemic.

Adipose Tissue, Appetite, and Obesity

THE RELATIONSHIP BETWEEN COVID-19 AND ENDOCRINOLOGY

Risk of Complications in Children With Type 1 Diabetes and Covid-19

Manish Gope Raisingani, MD.
University of Arkansas for Medical Sciences., LITTLE ROCK, AR, USA.

Background: There is some data available in adults which suggests that Type 1 diabetes may be associated with higher risk with Covid-19 (1). Limited data has been available in pediatric Type 1 diabetes with Covid-19. **Methods:** We used TriNetX, with a large COVID-19 database, collecting real-time electronic medical records data. We compared children (0–18 years) who were diagnosed with Covid-19 with and without Type 1 diabetes. This database collected information from 54 health care organizations. **Results:** Mortality rate in children with Covid-19 and Type 1 diabetes was 0.618% (10/1618). Mortality rate in children with Covid-19 without Type 1 diabetes was 0.102% (257/251517). Relative risk of mortality for children with Covid-19 and Type 1 diabetes was 6.05 with a p value of < 0.0001. Endotracheal intubation rate in children with Covid-19 and Type 1 diabetes was 0.618% (10/1618). Endotracheal intubation rate in children with Covid-19 without Type 1 diabetes was 0.071% (178/251517). Relative risk of endotracheal intubation for children with Covid-19 and Type 1 diabetes was 8.73 with a p value of < 0.0001. Pneumonia rate in children with Covid-19 and Type 1 diabetes was 0.804% (13/1618). Pneumonia rate in children with Covid-19 without Type 1 diabetes was 0.562% (1414/251517). Relative risk of pneumonia for children with Covid-19 and Type 1 diabetes was 1.43 with a p value of < 0.1959. Septic shock rate in children with Covid-19 and Type 1 diabetes was 1.05% (17/1618). Septic shock rate in children with Covid-19 without Type 1 diabetes was 0.293% (737/251517). Relative risk of septic shock for children with Covid-19 and Type 1 diabetes was 3.59 with a p value of < 0.00001. Conclusion: Mortality rate, endotracheal and septic shock were increased in children with Type 1 diabetes and Covid-19 versus children with Covid-19 and no Type 1 diabetes. Further studies with larger sample size are needed to study complication rate of Covid-19 and Type 1 diabetes. References 1) Associations of type 1 and type 2 diabetes with COVID-19-related mortality in England: a whole-population study. Lancet Diabetes Endocrinol 2020 Oct;8(10):813–822. doi: 10.1016/S2213-8587(20)30272-2. Epub 2020 Aug 13.

Adipose Tissue, Appetite, and Obesity

WHAT'S NEW IN WEIGHT MANAGEMENT THROUGH THE LIFESPAN?

Dextroamphetamine Treatment for Children With Hypothalamic Obesity

Jiska van Schaik, MD[1], Mila Sofie Welling, MD[2], Corjan De Groot, MD, PhD[2], Ozair Abawi, MD[2], M Burghard, MSc[1], Lotte Kleinendorst, MD[3], Bibian van der Voorn, MD[2], Mieke M. van Haelst, MD, PhD[3], S BJ Oude Ophuis, MD[1], Gerdien Kamp, MD[4], Joost Rotteveel, MD, PhD[3], A YN van Schouten-Meeteren, MD, PhD[5], Erica L T van den Akker, MD, PhD[2], Hanneke Margo van Santen, MD PhD[1].
[1]Wilhelmina Children's Hospital, University Medical Center, Utrecht, Netherlands, [2]Erasmus MC Sophia Childrens Hospital, University Medical Center, Rotterdam, Netherlands, [3]Vrije Universiteit Amsterdam/University of Amsterdam, Amsterdam, Netherlands, [4]Tergooi Hospital, Blaricum, Netherlands, [5]Princess Maxima Center for Pediatric Oncology, Utrecht, Netherlands.

Introduction: Hypothalamic obesity (HO) in children can be either genetic or acquired, as a result of a suprasellar tumor or its treatment. HO, resulting from hyperphagia and/or a decreased resting energy expenditure (REE), may have devastating consequences for the child and its family. Currently, no effective drug treatment is yet available for HO. Amphetamines – commonly used in children with attention-deficit/hyperactivity disorder – are known for their stimulant effect on REE and inhibitory effect on appetite. We here present our experiences of dextroamphetamine treatment in children and adolescents with acquired or genetic HO. **Methods:** A retrospective cohort evaluation was performed of patients (n = 18) treated with dextroamphetamine at 2 endocrine pediatric clinics. Off-label use of dextroamphetamine was initiated in patients with progressive therapy resistant acquired HO (n = 13) and in patients with genetic obesity (n = 5). Initial treatment dosing was once or twice daily 5mg. This dose was weekly increased with 5 mg/day depending on the patient' wellbeing and the presence of side effects, to a maximum of 0.5 mg/kg/day. Anthropometrics and REE at start and during follow-up, changes in (hyperphagic) behavior, and side effects were assessed.
Results: At start of treatment, mean age was 12.8 years ± 3.4 [range 7.1–17.9] and mean REE was 69.5%± 18.5 (n = 15). At follow-up, mean treatment duration was 18.3 months ± 14.7. Ten out of eighteen children (55.6%) showed clinically relevant weight loss. In 10/13 patients with acquired HO,

weight loss was observed (mean ΔBMI SDS -1.09 ± 1.00), in one patient BMI stabilization (ΔBMI SDS +0.03), and in two patients an increase in BMI SDS was seen (mean ΔBMI SDS +0.32 ± 0.05). Of nine children with acquired HO and measurement of REE before and during treatment, a mean REE increase of +15.3% ± 10.5 was observed. In three out of five patients with genetic obesity, initially weight loss was observed resulting in BMI stabilization at end of follow-up due to weight regain (mean ΔBMI SDS -0.08 ± 0.19). In these patients, no difference in REE before and during treatment was observed. In two patients an increase in BMI SDS was seen (mean ΔBMI SDS +0.29 ± 0.25). However, one patient discontinued treatment after one month, due to hypertension. Thirteen out of 18 children (72.2%) reported improvement of either their hyperphagia, energy level, and/or behavior. No serious side effects were reported.
Conclusion: In children and adolescents with acquired HO, treatment with dextroamphetamine may significantly lower BMI, reduce hyperphagia and improve activity level. In genetic HO, these effects were less pronounced. Future studies in a larger cohort and with randomized controlled designs are needed to support these results.

Adipose Tissue, Appetite, and Obesity
WHAT'S NEW IN WEIGHT MANAGEMENT THROUGH THE LIFESPAN?

Once-Weekly Exenatide Enhances Weight Loss Maintenance in Adolescents with Severe Obesity: A Randomized, Placebo-Controlled Trial

Claudia K. Fox, MD MPH[1], Kyle Rudser, D, PhD[1], Justin Clark, BA[1], Justin R. Ryder, PhD[1], Amy C. Gross, PhD[1], Brandon M. Nathan, MD[1], Muna Sunni, MBBCh[1], Donald R. Dengel, PhD[1], Charles John Billington, MD[2], Megan O. Bensignor, MD[1], Aaron S. Kelly, PhD[1].
[1]University of Minnesota, Minneapolis, MN, USA, [2]MINNEAPOLIS VA Medical Center, Minneapolis, MN, USA.

Background: In adolescents with severe obesity, long-term weight loss maintenance using lifestyle therapy alone is hampered by numerous biological adaptations favoring weight regain such as increased appetite and sense of food palatability and decreased satiety and resting energy expenditure. Anti-obesity pharmacotherapy may have a role in mitigating some of these physiological adaptations, thereby enhancing weight loss maintenance. We conducted a randomized, double-blind, placebo-controlled clinical trial to evaluate the effect of the glucagon-like peptide-1 receptor agonist (GLP-1RA) exenatide extended release (XR) on the maintenance of BMI reduction and improvements in cardiometabolic risk factors induced by short-term meal replacement therapy (MRT) among adolescents with severe obesity. **Methods:** One-hundred adolescents ages 12 to <18 years with BMI ≥120% of the 95th percentile engaged in an MRT intervention consisting of pre-portioned meals averaging 1,400 kcals/day with a goal of reducing BMI by ≥5% within eight weeks. Participants achieving this goal were randomized 1:1 to either exenatide XR (2 mg/week subcutaneously) + lifestyle therapy or matching placebo + lifestyle therapy for a subsequent 52 weeks. The primary outcome was mean percent change in BMI from randomization (post-MRT) to 52 weeks. Secondary outcomes included changes in body fat (DXA) and cardiometabolic risk factors. **Results:** Sixty-six participants (mean age 16±1.5 years; 47% female; mean BMI 36.9±4.4 kg/m^2) achieved ≥5% BMI reduction with MRT and were randomized; 56 (85%) completed the 52-week visit. From randomization (post-MRT) to 52-weeks, the exenatide and placebo group mean BMI increased 4.6% and 10.1%, respectively. The prespecified intention-to-treat, last observation carried forward primary analysis demonstrated a placebo-subtracted exenatide treatment effect of -4.1% (95% CI -8.6 to 0.5, p=0.078). The per-protocol analysis (excluding participants with major protocol deviations) demonstrated a placebo-subtracted exenatide treatment effect of -5.7% (95% CI -10.9 to -0.6, p=0.030). The placebo-subtracted exenatide treatment effect on total body fat was -3.0 kg (95% CI -6.7 to 0.7, p=0.108), systolic blood pressure -3.2 mmHg (95% CI -7.0 to 0.7, p=0.107), and triglycerides to HDL ratio -0.6 (95% CI -1.2 to 0.0, p=0.050). Exenatide was generally well-tolerated and the adverse event profile was similar to previous reports of GLP-1RAs. **Conclusion:** The steep trajectory of weight regain following short-term MRT, particularly in the placebo group, underscores the challenge many adolescents encounter in maintaining weight loss over time. GLP-1RA treatment with once-weekly exenatide appears to partly mitigate the propensity toward weight regain after initial dietary-induced weight loss among adolescents with severe obesity.

Adipose Tissue, Appetite, and Obesity
WHAT'S NEW IN WEIGHT MANAGEMENT THROUGH THE LIFESPAN?

Weight Loss Maintenance With Once-Weekly Semaglutide 2.4 MG in Adults With Overweight or Obesity Reaching Maintenance Dose (STEP 4)

Domenica M. Rubino, MD[1], Niclas Abrahamsson, MD[2], Melanie Davies, MD[3], Dan Hesse, PhD[4], Frank L. Greenway, MD[5], Camilla Jensen, MSc[4], Ildiko Lingvay, MD, MPH, MSCS[6], Ofri Mosenzon, MD[7], Julio Rosenstock, MD[8], Miguel A. Rubio, MD[9], Gottfried Rudofsky, MD[10], Sayeh Tadayon, MD[4], Thomas A. Wadden, PhD[11], Dror Dicker, MD[12].
[1]Washington Center for Weight Management, Arlington, VA, USA, [2]Endocrinology Unit, Department of Medical Sciences, Uppsala University, Uppsala, Sweden, [3]Diabetes Research Centre, University of Leicester; Diabetes Research Centre, University of Leicester and NIHR Leicester Biomedical Research Centre, Leicester General Hospital, Leicester, United Kingdom, [4]Novo Nordisk A/S, Søborg, Denmark, [5]Pennington Biomedical Research Center, Louisiana State University System, Baton Rouge, LA, USA, [6]UT Southwestern Medical Center, Dallas, TX, USA, [7]Diabetes Unit, Department of Endocrinology and Metabolism, Hadassah Medical Center, Faculty of Medicine, Hebrew University of Jerusalem, Ein Kerem, Israel, [8]Dallas Diabetes Research Center at Medical City, Dallas, TX, USA, [9]Endocrinology and Nutrition Department, Hospital Clínico Universitario San Carlos and Instituto de Investigación Sanitaria del Hospital Clínico San Carlos (IdISSC), Madrid, Spain, [10]Clinic of Endocrinology and Metabolic Diseases, Cantonal Hospital, Olten, Switzerland, [11]Department of Psychiatry, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA, [12]Internal Medicine Department & Obesity Clinic, Hasharon Hospital-Rabin Medical Center, Petach-Tikva, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel.