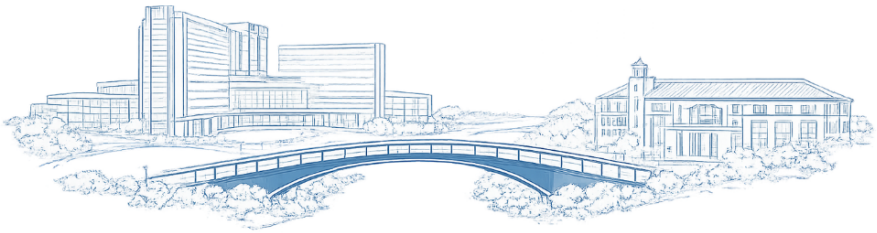
Friday, October 2, 2026

Health Sciences Research Building I
Emory University

BUILDING BRIDGES

A Workshop to Advance Pediatric Obesity Research at Emory and Children's



ABSTRACT BOOK

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Research and Epidemiology for Adolescent and Child Health

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Proteomic Changes Following Adolescent Metabolic and Bariatric Surgery

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Presenting Author: Brittney O. Baumert, PhD, MPH

Background: Metabolic and bariatric surgery (MBS) induces substantial and durable weight loss in adolescents with severe obesity, yet the long-term molecular adaptations accompanying these changes remain incompletely understood. We characterized longitudinal proteomic remodeling in adolescents following MBS for up to 3 years post-MBS.

Methods: We analyzed 702 circulating proteins measured using Olink Inflammation and Cardiometabolic panels in participants from the Teen-LABS study at baseline (time of surgery, n=171) and 6- (n=129), 12- (n=124), and 36-month (n=109) follow-up visits. Longitudinal changes in normalized protein expression (NPX) were evaluated using protein-specific linear mixed-effects models with visit modeled categorically and baseline as the reference. Models adjusted for time-varying BMI and baseline age, sex, race, household income, and study site, with participant-specific random intercepts to account for repeated measures. False discovery rate (FDR) correction was applied across all proteins. Proteins with FDR $q \leq 0.05$ and a consistent direction of change across all postoperative visits were considered to exhibit sustained remodeling. Analyses focused on proteins demonstrating changes by 6 months that persisted through 36 months. Descriptive pathway annotation analyses were performed using Molecular Signatures Database (MSigDB) annotations.

Results: Among 702 proteins evaluated, 297 (42.3%) demonstrated significant longitudinal changes and maintained a consistent direction of effect across all postoperative visits (FDR $q \leq 0.05$). Of these, 234 proteins (78.8%) were consistently increased and 63 (21.2%) were consistently decreased relative to baseline. Proteins exhibiting the largest sustained increases included NPPB (mean ΔNPX=1.70), IGFBP1 (1.24), NT-proBNP (0.96), IGFBP2 (0.86), and REG1B (0.73). Additional increases were observed in proteins involved in metabolic regulation, tissue repair, and extracellular matrix remodeling, including EPO, SPP1, REG1A, REG3A, and MMP1. The largest sustained decreases were observed for SSC4D (−1.37), COL9A1 (−1.23), IL1RN (−0.90), GSTA1 (−0.87), and ADH4 (−0.82). Pathway annotation analyses indicated that proteins increasing after surgery were primarily associated with extracellular matrix organization, cell adhesion, immune regulation, inflammatory responses, and growth factor signaling. Proteins decreasing after surgery were linked to inflammatory signaling, vesicle-mediated transport, cell-surface signaling, and hepatic metabolic processes.

Conclusions: Adolescent MBS is associated with widespread and durable proteomic remodeling that persists for at least three years following surgery, and these molecular adaptations were not fully explained by weight loss. Sustained increases in proteins involved in extracellular matrix remodeling, growth factor signaling, tissue repair, and immune regulation, alongside reductions in inflammatory and hepatic metabolic proteins, suggest long-term biological adaptation accompanying substantial weight loss and metabolic improvement. These findings provide novel insight into molecular pathways that may contribute to the durable cardiometabolic benefits of MBS during adolescence.

A Probiotic that Mitigates Metabolic Disease and Induces Hepatoprotection Through Modulation of the Gut-Liver Metabolome

Authors: Gacasan, Anthony; Weinberg, Jaclyn; Jones, Dean; and Jones, Rheinallt

Presenting Author: Rheinallt Jones, PhD

Introduction: The gut-liver axis is a dynamic communication network regulated in part by metabolites produced by host cells and resident microbiota. Changes in microbial composition and metabolic activity can influence both intestinal and hepatic health. We investigated whether supplementation with the probiotic Lactococcus lactis subsp. cremoris (LLC) protects against metabolic disease and liver injury through modulation of the gut-liver metabolome.

Methods: C57BL/6 mice were fed a Western-style diet and supplemented three times weekly for 16 weeks with 1 × 10^9 CFU LLC (ATCC 19257), Lacticaseibacillus rhamnosus GG (LGG; ATCC 53103), or HBSS vehicle control. Serum and liver metabolites were profiled by liquid chromatography-high resolution mass spectrometry (LC-HRMS) and analyzed using metabolomic pathway enrichment tools. In a separate experiment, mice received LLC, LGG, or vehicle prior to acetaminophen (APAP; 300 mg/kg) challenge and were evaluated for acute liver injury by histopathology. Gene expression was assessed by RT-qPCR.

Results: We previously demonstrated that LLC attenuates Western diet-induced obesity and hepatic steatosis. LC-HRMS revealed distinct alterations in serum and hepatic metabolite profiles in LLC-treated mice compared with controls. Pathway enrichment analysis identified significant enrichment of biosynthesis of unsaturated fatty acids (EF = 5.91), tryptophan metabolism (EF = 1.88), riboflavin metabolism (EF = 4.31), and cytochrome P450-associated pathways (EF = 1.74). Following acetaminophen-induced liver injury challenge, LLC-treated mice exhibited significantly less centrilobular hepatic necrosis, consistent with enhanced resistance to acute hepatotoxic injury. Protection was accompanied by increased expression of genes associated with farnesoid X receptor (FXR) and nuclear factor erythroid 2-related factor 2 (NRF2) signaling.

Conclusions: LLC supplementation remodels the serum and hepatic metabolome in diet-induced metabolic disease, enriching pathways involved in lipid, vitamin, and xenobiotic metabolism. These adaptations promote a hepatoprotective state that attenuates acetaminophen-induced liver injury, potentially through activation of FXR- and NRF2-dependent pathways. LLC represents a promising probiotic strategy for improving metabolic health and enhancing liver resilience through modulation of the gut-liver axis.

Time-Restricted Feeding in Adolescent Female Rodents and Susceptibility to Obesity

Authors: Lazzaro, Mary; and Noble, Emily

Presenting Author: Mary Lazzaro, BS

Background: Time-restricted feeding (TRF) is a form of intermittent fasting that limits the daily eating window and is a clinical approach to treating obesity; however, its safety and efficacy in adolescents remain unknown. Adolescence is a critical period of development, and thus, TRF during adolescence may have long-term health consequences. Herein, we developed a rat model of adolescent TRF to determine the impacts on body composition, glucose metabolism, estrus cyclicity, and neurocognitive development.

Methods: Adolescent female Sprague Dawley rats were divided into four dietary groups: ad libitum standard chow (ad lib chow; n = 20) or a high-fat high-sugar diet (ad lib HFHS; n = 23) (Research Diets D12451), or the same diets with food access restricted to 8 hours per day (TRF chow, n = 24; TRF HFHS, n = 24). The Barnes Maze was used to measure learning and memory function. After 11 weeks of the TRF paradigm, (n = 46) animals were fed ad libitum to understand how adolescent TRF may affect susceptibility to obesity in adulthood.

Results: TRF reduced food intake and body weight compared with ad libitum-fed animals on a HFHS and chow diet. However, there were no differences in body fat between TRF and ad libitum animals. The differences in body weight were driven by reduced lean mass accrual in animals on TRF. TRF animals displayed compromised linear growth compared to ad libitum-fed counterparts. Adolescent TRF did not improve glucose clearance in animals fed a HFHS diet. TRF impaired estrus cyclicity, where TRF animals spent more time in the estrus phase. TRF chow-fed animals had impaired hippocampal-dependent memory function during adulthood compared to ad libitum fed controls. Adolescent TRF did not confer protection against diet-induced obesity in adulthood.

Conclusions: Weight loss due to TRF in adolescent female rodents was due to impaired linear growth and lean mass accrual and not reduced body fat gain. There was no benefit of TRF on protection against diet-induced obesity in adulthood, and TRF halted estrus cyclicity. The possibility that TRF may be more harmful than beneficial for adolescent females should be considered prior to clinical research into this weight loss strategy in humans.

Adolescent GLP-1 Receptor Agonist Improves Body Composition Without Impacting Adulthood Efficacy in a Rodent Model of Adolescent Obesity

Authors: Mills, Austin; and Noble, Emily

Presenting Author: Austin Mills, BA

Glucagon-like peptide-1 receptor agonists (GLP-1RAs), including semaglutide (Sem), are FDA-approved for treating obesity in adolescents ≥12 years, although effects on adolescent body composition and long-term susceptibility to obesity are unknown. Given the high prevalence of GLP-1RA cycling, it is also important to determine whether adolescent Sem alters the efficacy of this drug when administered again in adulthood. We use a rodent model to determine whether adolescent Sem reduces adiposity while preserving lean mass compared with calorically matched controls, provides lasting protection against adult obesity, and remains effective for weight loss upon re-exposure in adulthood.

96 adolescent male/female Sprague Dawley rats were equally assigned to four groups: chow (CTL) with vehicle injections (Veh), high fat high sugar diet (Hfhs) with Veh (HFHS), Hfhs with Sem injections (SEM; 70 µg/kg BW), and Hfhs with Veh pair-fed (PF) to match caloric consumption of SEM. After one week of Hfhs exposure, injections were administered daily for six weeks. Body composition was measured by DEXA every four weeks. During adulthood, motivation for palatable food was assessed using progressive ratio testing, and female SEM and HFHS groups were re-treated with Sem to evaluate drug efficacy following adolescent exposure.

One week of Hfhs increased body weight and food intake compared to CTL ($p<0.001$). Both Sem and PF reduced weight gain and food intake ($p<0.05$). SEM decreased fat accumulation ($p<0.01$) compared to HFHS and preserved lean mass, while PF did not reduce fat gain, despite similar weight reductions. In males, PF also reduced lean mass. Following Sem cessation (end of adolescence), body weight and adiposity in SEM quickly rebounded to match HFHS. Contrary to hypothesized, adolescent Sem had no effect on motivation for palatable food in adulthood and didn't reduce the efficacy of Sem given during adulthood.

These findings provide new insight into the effects of semaglutide during a critical period of growth and development. Specifically, our preclinical findings suggest adolescent Sem is preferrable to caloric restriction for selectively preventing fat gain while preserving lean mass. However, rapid weight rebound following treatment discontinuation underscores the importance of developing long-term treatment strategies that promote weight maintenance beyond active pharmacotherapy.

Hyperglycemia and Polyunsaturated Omega-6 Fatty Acids Significantly Reduce CFTR Channel Function and Modulator Sensitivity

Authors: Rintala, Ella; Foye, Catherine; White, Janiyah; Freestone, Emily; Shirley, Gabrielle; Collins, Genoah; Vazquez-Cegla, Analia J; Kopp, Benjamin T; Chandler, Joshua D; McCarty, Nael A; Alvarez, Jessica A; Daley, Tanicia; and Oliver, Kathryn E

Presenting Author: Ella Rintala, BS

Background: Cystic fibrosis-related diabetes (CFRD) is the most prevalent comorbidity among people with CF, a lethal autosomal recessive disorder caused by defects in the CF transmembrane conductance regulator (CFTR). CFRD is associated with more frequent acute pulmonary exacerbations and six-fold higher risk of mortality. Standard treatments include insulin delivery, continuous glucose monitoring, and improved diet quality, which improve lung function and survival. However, poor nutrition counteracts these efforts by increasing risks of obesity and cardiovascular complications. Polyunsaturated omega-6 fatty acids are pro-inflammatory and found in processed foods common to western diets, including the CF legacy diet. Our objective is to determine whether hyperglycemia and/or omega-6 fatty acids contribute to accelerated pulmonary decline through effects on CFTR functional expression.

Methods: CF bronchial epithelia (CFBE41o-), Fischer rat thyroid (FRT) cells, and primary human nasal epithelia were employed. Immortalized cells were stably transduced with wild-type (WT) CFTR or variants such as F508del or G542X. Cells were grown in hypoglycemia (0.5g/L), normoglycemia (1.0g/L), hyperglycemia (2.5g/L), or super-hyperglycemia (3.5g/L). Treatments also included a polyunsaturated omega-6 fatty acid (arachidonic acid), CFTR modulators (elexacaftor-tezacaftor-ivacaftor (ETI)), or read-through compound (G418). Glucose consumption, CFTR protein expression, and channel activity were measured.

Results: In primary HNE and CFBE41o-, hyperglycemia diminishes WT-CFTR transepithelial ion transport between 6-33%. Hyperglycemia also reduces F508del-CFTR baseline activity (~34%) and ETI-rescued currents (~11%). Interestingly, hyperglycemia elicits no effects on WT- or F508del-CFTR protein biogenesis. In FRT cells, hyperglycemia significantly decreases G542X-CFTR processing at baseline. When exposed to arachidonic acid, this molecule depletes G418-mediated rescue of G542X cell surface localization. In primary HNE with CFTR F508del/G542X genotype, arachidonic acid decreases ETI-rescued CFTR activity from ~24% to ~16% of WT.

Conclusions: Results demonstrate hyperglycemia or arachidonic acid reduce WT and mutant CFTR activity at baseline and under small molecule-induced correction. Such influence may be elicited through accumulation of reactive oxygen species, which could impair CFTR plasma membrane insertion. Future studies will focus on understanding mechanisms by which dysregulated glucose and arachidonic acid affect redox state, CFTR function, and modulator sensitivity to strengthen precision medicine-based approaches to CFRD complications.

Notch Signaling Disrupts Ghrelin-cell Identity During Obesity and Type 2 Diabetes

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Presenting Author: Rina Shou, BS

Background: Obesity is a major driver and increasing risk factor of type 2 diabetes (T2D), including in children. A hallmark of T2D is perturbed glucose homeostasis, maintained by hormone-secreting endocrine cells. As the largest endocrine system, the gut produces >30 distinct hormones. The satiety hormone ghrelin is predominantly made by gastric endocrine cells. These cells expand with obesity, although they also become dysfunctional. As such, obese patients have lower plasma ghrelin levels. The mechanisms underlying pathophysiology are not known.

Methods: We harnessed fluorescent reporter mice to enrich for rare lineage-committed endocrine cells and Neurog3+ endocrine progenitor cells. Isolated cell populations were assessed by immunofluorescence, bulk, and single cell RNA-Sequencing. Diabetes and obesity were induced environmentally with high fat diet (HFD) or genetically with db/db mice. To interrogate function, we employed Notch gain- and loss-of-function mice and chemical inhibitors of Notch signaling.

Results: Like previous literature, HFD-fed and db/db mice had more ghrelin-cells and lower levels of plasma ghrelin. Of note, ghrelin+ cells derived from Neurog3+ endocrine progenitor cells were preferentially increased with obesity. To further interrogate these cells, we performed single cell RNA-Sequencing. Approximately 40% of genes significantly altered in Neurog3-derived endocrine cells were unique to obese ghrelin+ cells, suggesting disease-specific alterations. In support of this, bulk RNA-Sequencing of gastric Neurog3+ cells showed that ghrelin was a top gene increased in Neurog3+ cells isolated from db/db mice. KEGG pathway analyses of these cells also revealed upregulation of oxidative phosphorylation and reactive oxygen species, and downregulation of metabolic pathways. To identify signaling pathways driving these changes, we evaluated Notch signaling. Both Hes1, a Notch target, and Jag1, a Notch ligand, increased in stomach tissue with obesity. Gastric db/db Neurog3+ cells became more abundant and had more Hes1 mRNA compared to lean controls. While activation of Notch triggered more ghrelin-cells, inhibiting this pathway ameliorated abundance. Blocking Notch also restored Neurog3+ cell abundance, restored plasma ghrelin levels, and improved glucose homeostasis.

Conclusion: Our data demonstrate that obesity activates gastric Notch signaling in Neurog3+ cells to drive their differentiation into ghrelin-producing cells. Further, removal of this pathway improves plasma ghrelin levels and glucose homeostasis.

Ciliary ARL13B Prevents Obesity in Mice

Authors: Terry, Tiffany; Gigante, Eduardo; Alexandre, Coralie; Brewer, Kathryn; Yue, Xinyu; Berbari, Nicolas; Vaisse, Christian; and Caspary, Tamara

Presenting Author: Tiffany Terry, PhD

Background: Primary cilia are microtubule projections extending from nearly all cells and are critical regulators of energy homeostasis. Mutations in cilia-associated genes like MC4R, ADCY3, INPP5E, ALMS1, and components of the BBSome cause severe early-onset obesity in humans and mice. The molecular mechanisms by which primary cilia regulate energy homeostasis and feeding behavior remain poorly understood. ARL13B encodes a regulatory GTPase highly enriched on the ciliary membrane and has multiple functions, likely mediated by distinct effectors. We evaluated whether the ciliary GTPase ARL13B regulates energy homeostasis and whether its localization to cilia is required to control body weight and feeding.

Methods: We engineered an ARL13B mouse variant (ARL13BV358A) that retains normal biochemical activity but fails to localize to cilia. We assessed body weight, adiposity, glucose tolerance, insulin sensitivity, and food intake to determine the metabolic consequences of ciliary ARL13B loss. Using conditional alleles and Cre drivers targeting POMC and MC4R neurons, we tested the cell type-specific requirements for ARL13B. We then performed rescue experiments by restoring wild-type ARL13B expression either selectively in MC4R neurons or ubiquitously during postnatal and adult stages.

Results: Mice lacking ciliary ARL13B (Arl13bV358A/V358A) became overweight by 5 weeks of age and developed severe obesity by 10 weeks, accompanied by hyperphagia, glucose intolerance, and insulin resistance. Selective loss of ciliary ARL13B in MC4R-expressing neurons, but not POMC neurons, recapitulated the obesity phenotype, demonstrating a critical role for ARL13B in MC4R neuronal cilia. Restoration of wildtype ARL13B specifically in MC4R neurons prevented obesity in Arl13bV358A/V358A mice. Reintroduction of ciliary ARL13B after hypothalamic feeding circuits had formed resulted in normal body weight, indicating that ARL13B acts through ongoing signaling rather than developmental circuit formation. Furthermore, restoring ciliary ARL13B in obese adult mice reversed the obesity phenotype, demonstrating that ARL13B function remains required throughout adulthood. [TT1.1][CT1.2]

Conclusions: Ciliary ARL13B is both necessary and sufficient in MC4R neurons to maintain normal body weight and energy homeostasis. These findings support a model in which ARL13B continuously regulates acute ciliary signaling in hypothalamic feeding circuits and identify ciliary ARL13B as a key regulator of feeding behavior and obesity.

Cord Blood DNA Methylation Associates with Changes in Adiposity and Infant Growth During the First 5 Months of Life in the Healthy Start Study

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Presenting Author: Stephanie Waldrop, MD, MPH

Background: Pediatric obesity may have early life origins, yet early molecular biomarkers have not been identified.

Objectives: We hypothesized that cord blood DNA methylation would associate with higher infant percent fat mass per day (adiposity) and a larger increase in weight-for-age Z-score (WAZ) during the first 5 months of life among 585 infants from the Colorado Healthy Start Study.

Methods: Cord blood DNA methylation was assessed from 585 maternal-infant dyads via the Illumina 450K array. Adiposity was measured at birth and ~5 months of age via air displacement plethysmography (PeaPod). WAZ was calculated using the World Health Organization (WHO) Multicentre Growth Reference Study (1997-2003). We used linear regression to assess the relationship between DNA methylation and adiposity and WAZ within the first 5 months of life followed by the detection of differentially methylated regions (DMR) using Comb-p. Adjustments were made for maternal race/ethnicity, cell composition and infant sex.

Results: This population did not evidence rapid weight gain (mean WAZ = -0.34 SD units) nor excessive adiposity gain (mean adiposity gain 0.11% per day) during the first 5 months of life. Twenty-six DMRs associated with adiposity accrual and 43 with change in WAZ during this time period. These DMRs annotated to genes involved in tissue accretion, fetal and neonatal growth, lipid metabolism, adipogenesis, as well as insulin and serotonin signaling and TSH biological potency. Only one DMR was associated with both adiposity accrual and WAZ, and it annotated to the gene VARS2 (mitochondrial valyl-tRNA synthetase), which was hypermethylated in association with both phenotypes.

Conclusion: The DMRs identified contribute to characterizing the epigenetic variation surrounding infant growth and may serve as biomarkers of normal infant growth and adiposity accrual, though further studies are needed.

The NOURISH Project: Potential for Obesity Prevention through School-Based Food Pantries in Georgia

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Presenting Author: Ana Arana, MPH

Background: Nurturing Opportunities and Resources in School Pantries for Health (NOURISH) is a research partnership between Helping Hands Ending Hunger, Inc (HHEH) and the Emory Prevention Research Center to improve nutritional quality of food distributed through school-based food pantries across the state of Georgia. Helping Hands Ending Hunger (HHEH) partners with schools to redistribute surplus cafeteria foods and donated and purchased items through food bags distributed to students with the goal of providing family meals for the weekend. The purpose of this study is to understand HHEH program operations, perceived barriers to improving the nutritional quality of the food distributed, and the nutritional quality and level of processing of foods included in HHEH school pantry distribution bags.

Methods: We conducted a web-based survey of Coordinators in schools with active HHEH programs (n=89) in early 2026 (response rate 71.9%). We also conducted site visits at three participating schools, interviewing key personnel and school leadership, and documenting all foods and beverages included in weekly distribution bags. Each food item was evaluated using two frameworks: (1) Healthy Eating Research Nutrition Guidelines, classifying items as choose often, sometimes, or rarely, and (2) the NOVA classification system, categorizing items as unprocessed or minimally processed, processed, or ultra-processed.

Results: Schools distributed bags to an average of 25 students and their families in a typical week. We identified 48 food and beverage items (average of 15 items/bag; range: 14-17). Collectively, 52.1% of items met "choose often" criteria, 25.0% were "choose sometimes," and 18.8% were "choose rarely". NOVA classification showed that 27.1% of items were unprocessed or minimally processed, 29.2% were processed, and 43.8% were ultra-processed. Interest in building partnerships for increased local fresh foods was high. Barriers to improving nutritional quality included limited funding, partnerships, volunteers staff engagement, and time, as well as a desire to keep the bags a reasonable weight for students to take home.

Conclusions: Phase 2 of the research partnership will evaluate implementation support for improving nutritional quality of distributed food in 24 schools. HHEH's infrastructure could provide an excellent platform for food is medicine efforts focused on childhood obesity prevention.

Healthy Disorder: CHAOS and its Association to Nutrition and Activity among Mexican Mothers and their Children

Authors: Meguiar, Gabby; Morales Vargas, Alexa; Cunningham, Solveig; Ferranti, Erin; Sattler, Lilian; and Aguayo, Liliana

Presenting Author: Gabrielle Meguiar

Objectives: Pediatric obesity prevention efforts recognize families as a promising unit for intervention, but sub-optimal family relationships, and management may hinder their ability to adopt healthy behaviors. This study examined the relationship of family chaos with healthy family nutrition and health behaviors among Mexican low-income families with kindergarten-aged children.

Methods: Cross-sectional data from mother-child dyads (n=58/63) recruited for the Little Hearts study who completed the 6-month follow-up in June 2024 were used. Mothers self-reported their household structure and organization by answering the Confusion, Hubbub, and Order Scale (CHAOS) long form instrument, validated for Mexican Families. We utilized the Family Nutrition and Physical Activity (FNPA) as a 20-item scale and used an overall score and 2 sub-scores for eating and other behaviors. Maternal BMI and child BMI-percentile were calculated from height and weight measurements, with child percentile accounting for age and sex. Linear regression models were used to examine the relationship of CHAOS and FNPA scores and sub-scores, adjusting for mothers age and BMI, and child age, sex, BMI-percentile and subsequently SES factors (number of household members and years of maternal education completed).

Results: Higher chaos was independently associated with higher FNPA scores, indicating healthier outcomes (β =0.41,95% Confidence Interval: 0.17, 0.65). This model accounted for 22% of variance in FNPA scores. Subsequent analyses showed that the association was primarily driven by health behaviors (β =0.32, $p < 0.01$). The association of CHAOS with the eating behavior subscale was non-significant ($\beta = 0.16$, $p = 0.07$).

Conclusion: Among Mexican families with young children, higher household chaos was associated with health-promoting behaviors. This association was driven primarily by non-eating health behaviors suggesting that, in this sample, perceived household disorganization may reflect environmental busyness rather than dysfunction.

Funding: Emory University 2022 RSPH Dean's Pilot and Innovation Grant

Neighborhood Environments and Cardiovascular Risk in Children and Adolescents with Type 1 Diabetes

Authors: Ruiz-Perez, Raul; McCauley, Linda; and Griggs, Stephanie Alisha

Presenting Author: Raul Ruiz-Perez, MN, RN

Background: The neighborhood environment is an increasingly recognized determinant of cardiovascular health. While children and adolescents with type 1 diabetes (T1D) face inherent disease-related risks, the degree to which residential obesogenic environments, characterized by limited healthy food access, low walkability, transport infrastructure, and limited green space, compound these risks remains unclear. We examined the contribution of obesogenic environments to cardiovascular risk profiles in children and adolescents.

Methods: This retrospective observational cohort study linked ZIP code-level obesogenic risk scores to clinical data from 20,244 children and adolescents (aged 2-20 years) across 67 endocrinology centers in the T1D Exchange Registry (2007-2017). Two hypotheses were tested: (1) higher obesogenic neighborhood risk is associated with higher levels of individual and composite scores including body mass index (BMI) z score, glycated hemoglobin (HbA1c), low-density lipoprotein cholesterol (LDL-C), and blood pressure (BP) z score; and (2) residing in high-risk environments (≥90th percentile) increases the odds of meeting clinically significant risk thresholds (BMI ≥85th percentile, HbA1c ≥7%, LDL-C ≥100 mg/dL, and BP ≥90th percentile). Multivariable linear regression assessed associations with continuous markers, and logistic regression determined the odds of exceeding clinical thresholds.

Results: Residing in higher risk obesogenic environments was associated with higher BMI z scores ($B = 0.019$, $p = 0.005$), higher HbA1c ($B = 0.028$, $p = 0.011$), higher blood pressure z scores ($B = 0.022$, $p < 0.001$), and higher cardiovascular risk composite scores ($B = 0.011$, $p < 0.001$). Individuals living in the highest risk obesogenic neighborhood environments had 22% higher odds of overweight or obesity (95% CI 1.07, 1.41), 52% higher odds of high HbA1c (95% CI 1.20, 1.92), and 27% higher odds of a high cardiovascular risk composite (95% CI 1.12, 1.43). LDL-C was not significantly associated with obesogenic neighborhood risk.

Conclusions: In this large national registry cohort, obesogenic neighborhood environments were associated with cardiovascular risk indicators across multiple domains in children and adolescents with T1D. Addressing structural environmental barriers alongside traditional diabetes care may be important for reducing cardiovascular risk across the early life course. These findings support incorporating environmental context into cardiovascular risk assessment.

Trends in Beverage Consumption Among U.S. Children: A Decade of Change (2011–2023)

Authors: Sanchez-Torres, Cristian; Chiang, Katelyn; DeSantos, Karla; Ramirez Tovar, Ana; Vos, Miriam; and Welsh, Jean

Presenting Author: Cristian Sanchez-Torres, MD

Background: Childhood obesity rates are increasing, with notable socioeconomic disparities. Beverage consumption patterns have been linked to a higher risk of obesity and related chronic diseases. While the intake of sugar-sweetened beverages (SSBs) and dairy is known to have been decreasing before the COVID epidemic, more recent trends and the extent to which they are consistent across economic subgroups, is not known.

Methods: 17,727 twenty-four-hour dietary recall data from 2–19-year-old participants in each of the 2-year cycles of National Health and Nutrition Examination Survey (NHANES) from 2011-2023 were analyzed to assess beverage intake. Beverage classification was based on What We Eat in America. Trends in leading sources of free sugars, SSBs and juice, were also assessed in combination. The prevalence of consumption and mean intake as a percentage of total energy intake (TEI) and in total ounces were estimated. Trend analyses were conducted using regression models and methods designed to account for the complex sampling design. Analyses were stratified by age, race/ethnicity, and household income.

Results: Between 2011–2012 and 2021–2023, there was a significant decline in the prevalence of all beverages excluding water from 97.6% to 88.2%. Prevalence declines were greatest for dairy (70.9% to 56.7%) and sweetened beverages (63.1% to 46.8%%), with consistency in this trend across all income groups. TEI from all beverages also decreased, from 19.3% to 13.6% with reductions greatest in the free sugar-containing beverages,100% juice and SSBs. The lowest-income households consistently had the highest consumption of SSBs, with a prevalence of 52.3% and 5.8% TEI in the 2021-2023 cycle). The decline in dairy consumption was greatest among the highest-income households, with a prevalence of 77.8% to 48.1% and TEI from 9.5% to 5.3%. In contrast, water consumption increased across all income levels (p-trend <0.0001), with 2021-2023 consumption prevalence 82.3% among the lowest, and 95.4% among the highest high-income households.

Conclusions: The findings suggest a growing trend towards a healthier beverage choice in the diets of U.S. children. However, income disparities persist, with low-income households still consuming high amounts of sugar beverages and higher income families consuming less dairy milk.

Unexpectedly High Burden of Liver Disease in Young Latino Children

Authors: Sanchez-Torres, Cristian; Ramirez Tovar, Ana; Gillespie, Scott; Huneault, Helaina; Yaranga, Claudia; DeSantos, Karla; Carapio-Chaparro, Christina; James, Brittany; Refugjati, Ermena; Kang, Gloria; Khanna, Geetika; Knight-Scott, Jack; Alazraki, Adina; Aguayo, Liliana; Santoro, Nicola; Bai, Shasha; Welsh, Jean; and Vos, Miriam

Presenting Author: Cristian Sanchez-Torres, MD

Background: Metabolic dysfunction–associated steatotic liver disease (MASLD) is the most common liver disease worldwide and is strongly associated with future hepatic and cardiometabolic morbidity and mortality. Current US screening guidelines recommend screening beginning at age 10 years, with little data to support this age cutoff. Hispanic youth are known to be at increased risk and severity of MASLD, but few studies have included children under the age of 10 years, despite this increased risk. The aim of this study was to test for MASLD and risk factors in prepubertal Hispanic children.

Methods: We prospectively recruited 170 Latino children aged ≥6–9 years who were presumed healthy by their parents. The children underwent MRI and biomarker screening for hepatic steatosis and liver disease as part of a clinical trial pre-screening visit (NCT05292352). MASLD was defined as hepatic steatosis ≥5% plus 1+ cardiometabolic-criteria. Genotyping for PNPLA3 rs738409:G was performed (G allele is associated with MASLD).

Results: Of 170 participants (mean age 7.9 years SD 1.1, 57% male), 27% were categorized as normal weight, 18% overweight, and 55% obese using established sex and age-adjusted BMI percentile cutoffs. The frequency of the PNPLA3 risk allele was 83.3% (51.4% CG, 31.9% GG). Overall, 33% of children had MASLD. When stratified by BMI, 53% of children with obesity had MASLD. Notably, 44% of six-year-old children with obesity already had hepatic steatosis ≥ 5%, and 22% had elevated ALT. Controlling for age and sex, children with obesity were 11 times more likely to have MASLD (OR 11.31, CI 4.0–40.7). Those with PNPLA3 GG were 9.2 times more likely to have MASLD compared to CC (OR 9.24, CI 2.42–42.8).

Conclusion: MASLD onset may occur earlier than previously thought and delays in screening until age 10 years may miss important opportunities to interrupt the progression. The presence of obesity is the best predictor for MASLD, even in Hispanic/Latino children as young as 6 years old. This evidence supports lowering the age of screening in Hispanic/Latino children and particularly for those who are obese.

Associations between Central Adiposity and Cardiometabolic Risk in School-Aged Hispanic Youth

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Presenting Author: Jean A. Welsh, PhD, MPH, RN

Background: Obesity and the metabolic abnormalities that contribute to poor cardiometabolic health are often present well before clinical onset. However, the optimal age and strategies for early screening remain unclear. Central adiposity is strongly associated with increased cardiometabolic risk, but the predictive value of waist circumference as a screening tool beyond that of body mass index (BMI) is not known. The objective of this analysis was to examine the relationship between central adiposity measured using the ratio of waist circumference to height and key indicators of cardiometabolic health in a population of children at elevated risk.

Methods: Data from 161 Hispanic/Latino children aged 6–9 years (Tanner stage 1, BMI >50th percentile, ALT ≤23 IU for girls and ≤26 IU for boys, HbA1c <6.4, no chronic disease history) enrolled in an ongoing clinical trial (NCT05292352) were used. Anthropometrics (weight, height, waist circumference) were measured by trained staff, and biomarkers were analyzed using standard protocols. Odds ratios were calculated to examine associations between obesity (BMI >95th percentile) with and without high central adiposity (waist-to-height ratio >0.50) and indicators of elevated cardiometabolic risk: elevated triglycerides (>100 mg/dL), low HDL cholesterol (<40 mg/dL), and elevated ALT (>22 for girls, >26 for boys). A Haldane-Anscombe correction was applied to account for absence of low HDL in those without obesity or high waist circumference.

Results: The sample included 95 males and 66 females, mean age 7.4 years. Prevalence of obesity was 56.1% and of high central adiposity was 31.2%. The odds of increased cardiometabolic risk among those identified as having either obesity or high central adiposity were significantly greater than among those identified as having obesity only. The odds ratios for obesity or high central adiposity vs. obesity only were: high ALT=16.5 vs 6.9; elevated TG=17.8 vs. 5.9; and low HDL cholesterol=23.3 vs. 12.6, respectively.

Conclusion: The likelihood of identifying children with elevated risk or cardiometabolic disease were greater when either total adiposity (measured using BMI) or central adiposity (measured using waist to height ratio) were used than with total adiposity only. This suggest that adding assessment of waist circumference to standard adiposity screening protocols that currently include only BMI would be beneficial. Further study in more diverse samples will be needed to confirm these findings and ensure their generalizability.

Early Introduction to Fruit Juice is Associated with Increased Risk of Overweight/Obesity at 5 Years

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Presenting Author: Jean A. Welsh, PhD, MPH, RN

Background: Recommendations regarding sugar-containing beverages during early childhood have become increasingly restrictive, but evidence supporting delayed introduction of 100% fruit juice remains limited. We examined the association between introduction of 100% fruit juice before 12 months of age and overweight/obesity at 5 years among low-income U.S. children. We also evaluated whether greater sugar-containing beverage intake during early childhood mediated this association. We hypothesized that early fruit juice introduction would be associated with increased risk of overweight/obesity and that this relationship would be partially explained by higher later beverage consumption.

Methods: We analyzed longitudinal data from the WIC Infant and Toddler Feeding Practices Study-2, including maternal interviews, repeated 24-hour dietary recalls, and measured child height and weight obtained through WIC or healthcare providers. Mean intakes of 100% fruit juice, sugar-sweetened beverages (SSBs), and total sugar-containing beverages were compared by timing of fruit juice introduction and overweight/obesity status at 5 years. Modified Poisson regression models estimated adjusted relative risks (aRRs) for overweight/obesity associated with early fruit juice introduction and assessed attenuation after adjustment for later beverage intake.

Results: Children introduced to fruit juice before 12 months had a 27% higher risk of overweight/obesity at 5 years than those introduced at ≥12 months (aRR, 1.27; 95% CI, 1.02–1.58). Children introduced early consistently consumed more fruit juice, SSBs, and total sugar-containing beverages throughout early childhood than those introduced at ≥12 months. However, beverage intakes did not differ by overweight/obesity status at 5 years, and adjustment for usual beverage intake at age 5 years or average intake from ages 1–5 years did not attenuate the association between early fruit juice introduction and overweight/obesity.

Conclusions: Introduction of fruit juice before 12 months was associated with increased risk of overweight/obesity at 5 years. This association was not explained by greater sugar-containing beverage intake later in childhood, suggesting that other mechanisms may contribute. These findings support current recommendations to delay introduction of 100% fruit juice until 12 months of age.

Early Introduction to Fruit Juice is Associated with Increased Risk of Obesity at 7 Years among Children Exposed to a Metabolically Adverse Prenatal Environment

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Presenting Author: Jean A. Welsh, PhD, MPH, RN

Background: Recommendations to delay introduction of 100% fruit juice until 12 months have strengthened in recent years, yet evidence linking age at introduction with long-term health outcomes remains limited. Moreover, it is unknown whether associations differ by the prenatal metabolic environment, despite evidence that in utero exposure to maternal cardiometabolic dysfunction increases susceptibility to childhood obesity. We examined the association between early fruit juice introduction (<12 vs. ≥12 months) and obesity at ages 7 and 15 years and evaluated effect modification by maternal cardiometabolic health during pregnancy.

Methods: We analyzed data from the Avon Longitudinal Study of Parents and Children, including maternal reports of infant feeding, medical record–abstracted prenatal health information, and measured child height and weight at ages 7 and 15 years. Modified Poisson regression models estimated adjusted relative risks (aRRs) for obesity by timing of fruit juice introduction, stratified by maternal cardiometabolic health, defined by pre-pregnancy obesity, excessive gestational weight gain, or diabetes during pregnancy. Models adjusted for maternal education and other infant feeding characteristics.

Results: Among children exposed to maternal cardiometabolic risk during pregnancy, introduction of fruit juice before 12 months was associated with a 59% higher risk of obesity at age 7 years compared with introduction at ≥12 months (aRR, 1.59; 95% CI, 1.09–2.33). The association was strongest among children introduced before 6 months (aRR, 1.70; 95% CI, 1.15–2.50), whereas the association for introduction at 6–<12 months was weaker and not statistically significant (aRR, 1.39; 95% CI, 0.90–2.14). In contrast, among children not exposed to a metabolically adverse prenatal environment, early fruit juice introduction was not associated with obesity at age 7 years (aRR, 0.88; 95% CI, 0.65–1.18). Associations were attenuated and no longer statistically significant by age 15 years.

Conclusions: Early introduction of fruit juice was associated with increased obesity risk at age 7 years only among children exposed to maternal cardiometabolic adversity during pregnancy. These findings suggest that adherence to recommendations delaying fruit juice until 12 months may be particularly important for children at elevated metabolic risk and support targeted infant feeding education for mothers with pre-pregnancy obesity, excessive gestational weight gain, or diabetes during pregnancy.

Preliminary Impact of a Community-based Family Healthy Weight Program: The Fit Together Gwinnett Pilot Program

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Presenting Author: Jean A. Welsh, PhD, MPH, RN

Background: The Fit Together Gwinnett pilot program is being implemented by Children's Healthcare of Atlanta (Children's) as part of an effort to increase access by Georgia's children to a family healthy weight program (FHWP) offering the recommended 26 hours or more of healthy lifestyle education and support for those with overweight or obesity. The purpose of this analysis was to assess participation levels and the preliminary impact of this participation on children's weight status.

Methods: Children 6-11 y with overweight or obesity who are referred by their primary healthcare provider attend the Fit Together program with at least one adult family member free of cost. Enrollment is rolling and participants are encouraged to attend at least one of the two to three 2-hour sessions offered per week for up to one year. Sessions are held at a local parks and recreation facility and the program is delivered with the financial support and under the direction and management of staff from Children's. The curriculum was adapted from one developed at Duke University which combines fun, family-centered physical activity (1.5 hours) and experiential nutrition education (.5 hours). Participation was assessed using program records and impact on weight status was examined using growth charts and data collected as part of a healthcare visit. Mean change in body-mass-index z-scores (BMIz) from 6-months to 1-year prior to program enrollment and mean change from enrollment to follow-up after 6-12 months were estimated and the pre and post differences were tested using a paired t-test.

Results: Between January 23, 2024, when the pilot program was initiated, and April 1, 2025, 21 clinicians in 4 practice locations have referred 129 children to the Fit Together Gwinnett pilot program and 56 have enrolled. Among those enrolled, 13 (78% female, mean age 9 years) attended at least one Fit Together session and have since had at least one follow-up visit with their referring healthcare provider 6-12 months after enrollment. Seventy-seven% participated in >5 sessions, 46% participated in >13 sessions (26 hours). Mean (SD) change in BMIz from 6-months to 1-year prior to program enrollment was +0.10 (0.23) and from enrollment to 6-12 months after enrollment was -0.08 (0.17), p=0.03.

Conclusion: The preliminary results from the first 15 months of this ongoing pilot program demonstrate that the program is well-received by clinician's and families and suggest that participation is helping to improve the weight trajectory of the youth that attend.

Trends in Early Life Sugar-containing Beverage Consumption in the United States and Impact of Updated Expert Guidelines – NHANES 2013-2023

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Presenting Author: Jean A. Welsh, PhD, MPH, RN

Background: Over the past decade, there have been intensified efforts to delay sugary beverage introduction and to limit consumption of these beverages among young children. In 2017, the American Academy of Pediatrics and the American Heart Association recommended delaying introduction to 100% fruit until 12 months of age, restricting intake to no more than 4 ounces each day through a child's first 5 years, and avoiding added sugars, including those in sugar-sweetened beverages, before 24 months. Recent trends in consumption practices have not been well-characterized, and it is also unclear how many children are consuming beverages in alignment with these recommendations and if updated guidance has had an impact on consumption practices. Our objective was to examine trends in fruit juice and sugar-sweetened beverages consumption among children ≤5 years in the United States over the past decade and to assess impact of updated recommendations on consumption.

Methods: We used nationally representative 24-hour dietary recall data collected from children ≤5 years in 4 cycles of the National Health and Nutrition Examination Survey to characterize early childhood sugar-containing beverage consumption from 2013-2023. Mean intake of each beverage as a percent of total energy intake (%TEI), the proportion of any intake of each beverage, and the proportion of excessive fruit juice consumption (>4 ounces/day) were calculated for children in each cycle and in the periods before (2013-2016) and after (2017-2023) updated guidelines were released. Significant linear trends across the decade and differences between periods were tested. Consumption was also characterized across sociodemographic subgroups of children.

Results: From 2013-2023, there was a significant decreasing linear trend in the proportion of infants consuming fruit juice and in the mean intakes among children 1-5 years. Since updated guidelines were released, any infant fruit juice consumption and excessive intake for 1-5-year-olds fell from 17.8% and 39.5% in 2013-2016 to 10.9% and 31.1% in 2017-2023, respectively. Mean fruit juice intakes among consumers remained high (>8 ounces) over the decade, and disparities in intakes in alignment with fruit juice recommendations persisted with greater non-compliance among lower-income, Hispanic, and non-Hispanic Black children after new guidelines were released. In contrast to the positive trends in fruit juice intake, there were no significant changes in the proportion of infants and toddlers (<24 months) consuming any sugar-sweetened beverages or in the mean %TEI for sugar-sweetened beverages among 2-5-year-olds (14.8% and 3.1% in 2017-2023, respectively) over the decade or following the release of the new guidelines. Most recent data (August 2021-August 2023) show that children ≤5 years are consuming 5.6% of TEI from sugar-containing beverages alone.

Conclusion: Following intensified efforts to limit sugary beverages during early childhood, there have been disparities in improvement in fruit juice consumption and limited progress in sugar-sweetened beverage consumption among all children, underscoring the need for continued and targeted early nutrition education efforts.

Paraspinal Muscle Fat Fraction as an MRI Marker of Glycemic Risk in Pediatric and Young Adult Patients

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Presenting Author: Joel Martin, BS

Background: Visceral and non-visceral fat deposition is an important feature of metabolic dysfunction. While liver fat is commonly assessed on abdominal MRI using proton density fat fraction (PDFF) sequences, skeletal muscle fat deposition can also reflect glycemic risk. This study evaluated whether paraspinal muscle fat fraction (PMFF) measured on abdominal MRI imaging is higher in pediatric and young adult patients with Hemoglobin A1c (HbA1c) ≥5.7% compared with those with HbA1c <5.7%.

Methods: This was a single-institution, retrospective, IRB-approved study derived from a larger pediatric liver MRI PDFF dataset. The radiology information system was searched to identify patients younger than 20 years who underwent liver MRI for fat fraction between 2017 and 2025. All scans were acquired on a 1.5T Siemens scanner. Patients were included in our cohort if HbA1c was available within 3 months before MRI or, if unavailable, up to 3 months after MRI. Within this cohort, one patient with medication exposure potentially affecting muscle fat deposition was excluded. Left and right paraspinal muscle fat-fraction measurements were obtained by a single reader on axial PDFF maps, and average PMFF was calculated for each patient. Patients were grouped by HbA1c status using a threshold of 5.7%, corresponding to the lower limit of the prediabetes range. Median PMFF was compared between groups using the Wilcoxon rank-sum test.

Results: 47 patients were included in our analysis. The mean age was 13.9 years (range 9-20). Patients with HbA1c ≥5.7% (n=20) had statistically significantly higher median PMFF than patients with HbA1c <5.7% (n=27) (4.01% [IQR, 2.22-5.31%] vs 2.59% [IQR, 2.12-3.06%], p=0.0435).

Conclusion: PMFF measured on abdominal MRI fat-fraction maps was higher in patients with HbA1c ≥5.7%. These findings suggest that PMFF may serve as an MRI marker of glycemic risk in pediatric and young adult patients undergoing abdominal MRI with proton density fat fraction sequences.

Validation of Ultrasound Guided Attenuation Parameter Against MRI Proton Density Fat Fraction and BMI in a Pediatric Cohort

Authors: Jordan, Gregory; Martin, Joel; Gagnon, Marie-Helene; and Khanna, Geetika

Presenting Author: Gregory Jordan, MD

Background: Metabolic dysfunction-associated steatotic liver disease (MASLD) is now the most common cause of chronic liver disease in children, paralleling the rise in pediatric obesity. Noninvasive, cost-effective methods to quantify hepatic fat are needed, as MRI-based fat assessment can be resource and time intensive.

The goal of our study is to evaluate the association between ultrasound-guided attenuation parameter (UGAP) and MRI proton density fat fraction (PDFF) in pediatric patients undergoing routine clinical imaging, and to assess the association between BMI z-score and UGAP.

Methods: This IRB approved, retrospective cross-sectional study included patients younger than 20 years who underwent abdominal ultrasound with UGAP and abdominal MRI with LiverLab PDFF within 30 days of each other between September 2025-May 2026. Liver steatosis was estimated by segmentation of the liver using PDFF on a 1.5T Siemens scanner. UGAP measurements were obtained by an ultrasound technologist. The measurements were taken using a LOGIQ E10 ultrasound system (GE Healthcare).

Eligible pairs were identified using Epic SlicerDicer and de-identified for analysis. When multiple eligible exam pairs were present for a patient, the closest was used. An attending radiologist derived UGAP median (dB/cm/MHz) from stored ultrasound images, PDFF percent (%) from liver fat fraction Dixon image segmentation, and BMI z-score (when available) were taken from Epic, in blinded fashion. One patient with a hepatic tumor that confounded UGAP interpretation was excluded. Associations were assessed using Pearson and Spearman correlation. Statistical significance was set at $p<0.05$.

Results: After exclusion of the tumor case, 16 patients had paired UGAP and PDFF values available and 13 met the within 30-day criteria. In the 30-day cohort (n=13), UGAP showed a strong positive association with PDFF (Pearson r=0.90; Spearman rho= 0.70), Table 1. When including all paired exams (excluding the tumor case) (n=16), the association remained positive (Pearson r=0.82; Spearman rho= 0.62). UGAP was positively associated with BMI z-score in the 30-day cohort (Spearman rho = 0.71), Table 2.

Conclusions: In this preliminary pediatric cohort, UGAP showed a strong positive association with MRI PDFF and a positive association with BMI z-score. These findings support UGAP as a quantitative ultrasound marker of hepatic fat in children. We will continue to accrue data to improve accuracy of estimates and representation across PDFF values.

Weight Gain After Hematopoietic Cell Transplantation in Children with Sickle Cell Disease: A Comparison With Non-Transplanted Controls

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Presenting Author: Grace Kalmus, MPH

Background: Growth in pediatric sickle cell disease (SCD) post-hematopoietic cell transplantation (HCT) is not described, aside from our previous report of body mass index (BMI) increase post-HCT. We aimed to compare BMI between HCT and non-HCT cohorts to evaluate effect of HCT on BMI.

Methods: SCD patients post-HCT at CHOA (2016-2023), <19 years at HCT, and with ≥1 outpatient heights/weights 1-2 years post-HCT were included. HCT patients were matched 1:3 to non-HCT on sex, genotype, and DOB using greedy matching without replacement. Height/weight values were cleaned using R growthcleanr package, then BMI calculated and converted to z-score and percentile. Baseline BMI was defined as value closest to but pre-HCT and the highest BMI 1-2 years post-HCT was used for follow-up. Comparisons were made between HCT and non-HCT groups ($\alpha = 0.05$). An interaction ANCOVA model was constructed to evaluate HCT's impact on BMI.

Results: Of 112 SCD patients post-HCT, 70 met eligibility (94% allogeneic, 6% autologous). Post-matching, the final cohort included 70 HCT cases and 210 controls. HCT patients were majority male (57%), majority SS/Sβ0-thalassemia genotype (97%), and median age 8.5 years at HCT (IQR 5.6, 12.9). In 3-12 months pre-HCT, 71% cases and 69% controls were on hydroxyurea (p=0.63), and HCT patients had a slightly higher mean hemoglobin (9.4 g/dL vs 8.9 g/dL, p=0.04). Baseline weight did not differ significantly between groups (median z-score -0.12 vs. -0.10, p=0.4; healthy/underweight in 84% vs 89%, p=0.4).

On follow-up, cases had higher BMI z-score (0.45 vs 0.06, p=0.003), change in BMI z-score (0.41 vs. 0.21, p<0.001), and percentage overweight/obese (30% vs. 13%, p=0.002). HCT was significantly associated with higher follow-up BMI, with effect strongest for patients with low/average baseline. At average baseline BMI, HCT was associated with 0.325 higher follow-up z-score in HCT vs non-HCT patients, accounting for baseline BMI and matching (p<0.001). Baseline BMI was significantly associated with follow-up (p<0.001).

Conclusions: We demonstrate significant association between HCT and increasing BMI among a matched cohort of pediatric SCD patients. This association is strongest among patients with low/average baseline BMI, suggesting a group for monitoring/intervention. Future studies should evaluate durability, the impact of age, and clinical implications.

Velacur as a Non-Invasive Test for the Detection of Pediatric Hepatic Steatosis

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Presenting Author: Cristian Sanchez-Torres, MD

Background: Noninvasive, point-of-care tests to detect hepatic steatosis (HS) are needed for rapid diagnosis of MASLD in outpatient pediatric clinics, particularly in young children with early onset of the disease. Conventional ultrasound is the most widely used imaging modality due to its safety, tolerability, and ease of use in children. However, its performance is suboptimal, and it typically requires scheduling a separate appointment in radiology. Velacur is a non-invasive, point-of-care, ultrasound-based method for the assessment of attenuation and liver stiffness, demonstrated to be superior to Fibroscan for liver fat detection in adults (referenced to MRI-PDFF).

Methods: This prospective, cross-sectional study included 113 Hispanic/Latino children prospectively recruited from the community as part of a MASLD prevention trial. Each participant underwent both MRI-PDFF (Proton Density Fat Fraction) and Velacur assessment on the same day. The primary outcome was the presence of liver steatosis (≥5.2%) as measured by MRI-PDFF. The performance of Velacur attenuation coefficient estimate (ACE) was evaluated using Area Under Curve (AUC) analyses for hepatic steatosis thresholds of normal (<5.2%), mild (5.2 - 11%), and moderate (>11%) defined by MRI-PDFF.

Results: A total of 113 Hispanic/Latino children, aged 6-9 years, were included in the study (mean age: 7.9 years (SD 1.05) , 55% male). 34% of participants were categorized as obese, 18% overweight, and 48% as normal weight. Overall, 35% (n=40) had HS ≥5.2% as determined by MRI-PDFF. Velacur ACE had fair diagnostic performance for MASLD in children (AUC 0.76, CI 0.67 – 0.86). Using the optimal ACE cutoff of 250 dB/m, which maximized the combination of sensitivity and specificity, sensitivity was 70%, and specificity was 67%, Positive Predictive Value of 48% and Negative Predictive Value of 84%. For moderate steatosis (>11%) Velacur ACE diagnostic performance improved to AUC 0.88 (CI 0.78 – 0.98).

Conclusion: Velacur™ attenuation demonstrated fair to good performance in detecting hepatic steatosis in young children, particularly at higher levels of liver steatosis. While accuracy improves with increasing liver steatosis content, the overall negative predictive value of 84% supports clinical utility. Further validation in a larger more diverse pediatric population is needed.

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