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Nonalcoholic steatohepatitis is associated with cardiac remodeling and dysfunction

Tracey G. Simon, Daniel G. Bamira, Raymond T. Chung, et al. (2017) Obesity [1]

Objective: Preliminary data suggest that nonalcoholic fatty liver disease is associated with early heart failure (HF). However, whether nonalcoholic steatohepatitis (NASH) is directly associated with echocardiographic changes in cardiac structure or function remains unknown.

Methods: A retrospective cohort was identified of individuals (N=65) without known heart disease, undergoing elective bariatric surgery with perioperative liver biopsy, and available recent transthoracic echocardiography (TTE). TTE measures were evaluated by NASH status using correlation coefficients, ANOVA, and linear regression, accounting for cardiometabolic factors.

Results: Median age was 47 years; 22% (n=14) had NASH. NASH patients had increased median left atrial (LA) volume (28.6 mL/m^2 vs. 24.8 mL/m^2; P<0.0001) and left ventricular (LV) mass (82.6 g/m^2 vs. 78.6 g/m^2; P<0.0001), indexed for height. NASH was inversely correlated with indices of diastolic function, including septal E' (r=-0.90 [95% CI: -1.21 to -0.42]; P=0.020) and E:A (r=-0.31 [95% CI:-0.51 to -0.09]; P=0.037). In adjusted analyses, NASH remained associated with increased LV mass index (ß^1=7.16 [SE: 4.95]; P=0.001) and LA volume index (ß^1=0.19 [SE: 0.08]; P=0.001) and reduced lateral and septal E' (ß^1=-0.91, P=0.015; ß^1=-0.89, P=0.047, respectively).

Conclusions: In this bariatric cohort, NASH was associated with changes in myocardial structure and in load-dependent indices of LV diastolic function, suggestive of subclinical HF.

Commentaires : *Des données récentes suggèrent que l'inflammation systémique en lien avec les NASH, serait à l'origine de détérioration sub-clinique de la fonction cardiaque. Les auteurs ont ici tiré des données rétrospectives d'une cohorte de 65 patients ayant bénéficié d'une chirurgie bariatrique avec biopsie hépatique per-opératoire, et chez qui une échocardiographie transthoracique avait été réalisée en préopératoire. Des analyses de corrélation ont ensuite été effectuées. Il en ressort que les patients présentant une NASH histologiquement avérée, présentent davantage de trouble de relaxation myocardique et un volume atrial gauche majoré comparés aux patients sans NASH. La pathogenèse de ce phénomène reste néanmoins à éclaircir.*

MC4R-dependent suppression of appetite by bone-derived lipocalin 2

Mosialou I., Shikhel S., Liu J.-M., et al. (2017) Nature [2]

Bone has recently emerged as a pleiotropic endocrine organ that secretes at least two hormones, FGF23 and osteocalcin, which regulate kidney function and glucose homeostasis, respectively. These findings have raised the question of whether other bone-derived hormones exist and what their potential functions are. Here we identify, through molecular and genetic analyses in mice, lipocalin 2 (LCN2) as an osteoblast-enriched, secreted protein. Loss- and gain-of-function experiments in mice demonstrate that osteoblast-derived LCN2 maintains glucose homeostasis by inducing insulin secretion and improves glucose tolerance and insulin sensitivity. In addition, osteoblast-derived LCN2 inhibits food intake. LCN2 crosses the blood–brain barrier, binds to the melanocortin 4 receptor (MC4R) in the paraventricular and ventromedial neurons of the hypothalamus and activates an MC4R-dependent anorexigenic (appetite-suppressing) pathway. These results identify LCN2 as

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a bone-derived hormone with metabolic regulatory effects, which suppresses appetite in a MC4R-dependent manner, and show that the control of appetite is an endocrine function of bone.

Commentaires : *La régulation de la prise alimentaire est d'une complexité passionnante. Nous savons aujourd'hui que les peptides circulants comme la leptine, l'insuline, le GLP-1, le PYY, participent à modulation de la balance énergétique via leur chef d'orchestre hypothalamique. L'os émerge ainsi dans son rôle endocrine, via les ostéoblastes, qui sécrètent par exemple l'ostéocalcine qui interagit dans la régulation de l'homéostasie glucidique. Les auteurs mettent ici en évidence le rôle de LCN2 (lipocalin 2), une adipokine déjà connue comme étant sécrétée par le tissu adipeux. Or ici il est suggéré que sa synthèse est prédominante au sein des ostéoblastes versus des adipocytes. De plus LCN2 passe la barrière hémato encéphalique et rejoint le noyau paraventriculaire hypothalamique et active ainsi le récepteur MC4R qui est anorexigène, et diminue ainsi la prise alimentaire. Si l'os s'en mêle ...*

Higher densities of fast-food and full-service restaurants are not associated with obesity prevalence

Mazidi M., Speakman J. R (2017) Am. J. Clin. Nutrit. [3]

Background: The obesity epidemic in the United States has been mirrored by an increase in calories consumed outside of the home and by expansions in the numbers of, and portion sizes at, both fast-food restaurants (FFRs) and full-service restaurants (FSRs), leading some to blame the epidemic on the restaurant industry. If this were indeed true, one would predict that greater per capita densities of FFRs and FSRs would lead to greater obesity prevalence.

Objective: We evaluated the population-level association between both FSRs and FFRs and the prevalence of obesity and calculated the proportion of calories consumed in these establishments.

Design: In this ecological cross-sectional study, we used county-level data (aggregate-level data) for obesity prevalence across the mainland United States in 2012 and matched these data to county-level per capita densities of FFRs and FSRs in the same year. Multiple linear regression was used to determine the relation between the prevalence of obesity and the densities of FFRs and FSRs after adjustment for confounding factors.

Results: Contrary to expectations, obesity prevalence was highly significantly negatively related to the densities of both FFRs and FSRs (combined-effect R^2=0.195). This was principally because greater numbers of both FFRs and FSRs were located in areas in which individuals were on average wealthier and more educated. When we normalized for these factors (and additional socioeconomic variables), the associations between restaurant densities and obesity effectively disappeared (pooled R^2=0.008). Our calculations showed that the percentage of total calories consumed in FFRs and FSRs is a mean of only 15.9% of the total intake (maximum: 22.6%).

Conclusions: Variations in the densities of FFRs and FSRs are not linked to the prevalence of obesity in the United States, and food consumed in these establishments is responsible for <20% of total energy intake. This finding has implications for policy decisions regarding how we aim to tackle the obesity epidemic.

Commentaires : *Les auteurs mettent ici en évidence un phénomène intéressant : la prévalence géographique de l'obésité est inversement corrélée à la densité des fast-foods de ces mêmes régions aux États-Unis. Ainsi il s'avère que les restaurants type fast-food sont d'avantage localisés dans des zones géographiques où les niveaux socio-économique et éducatif sont plus élevés, et donc la prévalence de l'obésité plus faible. Une fois les analyses ajustées sur ces facteurs, le lien disparaît. L'absence de lien entre obésité et densité géographique de fast-foods peut alors s'expliquer par le rôle, au final probablement mineur, que joue ce type de restauration sur la problématique beaucoup plus vaste de la génèse de l'obésité.*

Increased physical activity associated with less weight regain six years after "The biggest loser" competition

Kerns J.C., Guo J., Fothergill E., et al., 2017. Obesity [4]

Objective: The aim of this study was to explore how physical activity (PA) and energy intake (EI) changes were related to weight loss and regain following "The Biggest Loser" competition.

Methods: At baseline, week 6 and week 30 of the competition, and 6 years after the competition, body composition was measured via dual-energy x-ray absorptiometry, resting energy expenditure was measured by using indirect calorimetry, and EI and PA were measured by using doubly labeled water.

Results: Six years after the competition, median weight loss in 14 of "The Biggest Loser" participants was 13%, with those maintaining a greater weight loss (mean±SE) of 24.9%±3.8% having increased PA by 160%±23%, compared with a PA increase of 34%±25% (P=0.0033) in the weight regainers who were 1.1%±4.0% heavier than the precompetition baseline. EI changes were similar between

weight loss maintainers and regainers (−8.7%±5.6% vs. −7.4%±2.7%, respectively; $P=0.83$). Weight regain was inversely associated with absolute changes in PA ($r=-0.82$; $P=0.0003$) but not with changes in EI ($r=-0.15$; $P=0.61$). EI and PA changes explained 93% of the individual weight loss variability at 6 years.

Conclusions: Consistent with previous reports, large and persistent increases in PA may be required for long-term maintenance of lost weight.

Commentaires : *Cette étude originale de par sa population d'étude (les participants à l'émission télévisée américaine "The Biggest Loser") et extrêmement rigoureuse sur le plan méthodologique vient confirmer les résultats d'études antérieures mais en se basant sur des mesures physiologiques objectives. Les auteurs mettent en évidence que 6 ans après un amaigrissement massif c'est la variable restriction alimentaire qui semble permettre d'obtenir une perte de poids rapide tandis que la variable activité physique semble elle la plus à même de prévenir la reprise de poids après amaigrissement. La méthodologie utilisée pour mesurer la dépense énergétique et les apports alimentaires apporte des données plus objectives que les auto-questionnaires couramment utilisés dans ce genre de recherche.*

Adherence to hunger training over 6 months and the effect on weight and eating behaviour: secondary analysis of a randomised controlled trial

Jospe M.R, Taylor R.W., Athens J. et al., 2017 [5]

Monitoring blood glucose prior to eating can teach individuals to eat only when truly hungry, but how adherence to 'hunger training' influences weight loss and eating behaviour is uncertain. This exploratory, secondary analysis from a larger randomized controlled trial examined five indices of adherence to "hunger training"', chosen *a priori*, to examine which adherence measure best predicted weight loss over 6 months. We subsequently explored how the best measure of adherence influenced eating behavior in terms of intuitive and emotional eating. Retention was 72% (n=36/50) at 6 months. Frequency of hunger training booklet entry most strongly predicted weight loss, followed by frequency of blood glucose measurements. Participants who completed at least 60 days of booklet entry (of recommended 63 days) lost 6.8 kg (95% CI: 2.6, 11.0; $p<0.001$) more weight than those who completed fewer days. They also had significantly higher intuitive eating scores than those who completed 30 days or less of booklet entry; a difference (95% CI) of 0.73 (0.12, 1.35) in body-food choice congruence and 0.79 (0.06, 1.51) for eating for physical rather than emotional reasons. Adherent participants also reported significantly lower scores for emotional eating of -0.70 (-1.13, -0.27). Following hunger training and focusing on simply recording ratings of hunger on a regular basis can produce clinically significant weight loss and clinically relevant improvements in eating behaviour.

Commentaires : *Cette étude analyse les résultats d'un programme « d'entraînement à la faim » incitant les patients à mesurer leur glycémie avant toute prise alimentaire et à ne manger que si celle-ci est inférieure à un seuil défini préalablement par les expérimentateurs en plus de la complétion d'un carnet alimentaire. Cette étude introduit l'idée d'aider les patients à parvenir à une alimentation plus intuitive en ajoutant à la prise en charge autour des signaux physiologiques, un contrôle glycémique. Cette adjonction peut sembler intéressante chez les patients déconnectés de leur signaux physiologiques en leur permettant un feedback objectif. Les résultats bien qu'intéressants en termes de perte de poids mériteront d'être validés par d'autres études et étudiés au-delà de l'année de suivi dans la mesure où si l'alimentation émotionnelle diminue et l'alimentation intuitive augmente on ne peut s'empêcher de noter que la restriction cognitive qui semble s'installer pourrait expliquer la perte de poids observée. Malgré tout, alors que les études centrées sur l'alimentation intuitive peinent à mettre en évidence des pertes de poids significatives, le contrôle glycémique en tant que feedback physiologique pourrait permettre aux patients de mieux s'approprier leurs sensations physiologiques, d'augmenter l'alimentation intuitive et de perdre du poids.*

Food-related impulsivity in obesity and binge eating disorder. A systematic update of the evidence

Giel K.E, Teufe, M., Junne F. (2017). Nutrients [6]

The specific eating pattern of Binge Eating Disorder (BED) patients has provoked the assumption that BED might represent a phenotype within the obesity spectrum that is characterized by increased impulsivity. Following the guidelines of the PRISMA statement (preferred reporting items for systematic reviews and meta-analyses), we here provide a systematic update on the evidence on food-related impulsivity in obese individuals, with and without BED, as well as normal-weight individuals. We separately analyzed potential group differences in the impulsivity components of reward sensitivity and rash-spontaneous behavior. Our search resulted in twenty experimental studies with high methodological quality. The synthesis of the latest evidence consolidates conclusions drawn in our initial systematic

review that BED represents a distinct phenotype within the obesity spectrum that is characterized by increased impulsivity. Rash-spontaneous behavior in general, and specifically towards food, is increased in BED, while food-specific reward sensitivity is also increased in obese individuals without BED, but potentially to a lesser degree. A major next step for research entails the investigation of sub-domains and temporal components of inhibitory control in BED and obesity. Based on the evidence of impaired inhibitory control in BED, affected patients might profit from interventions that address impulsive behavior.

Commentaires : *Les auteurs réalisent une mise à jour d'une précédente revue de la littérature sur le sujet au vu du développement des études dans le domaine depuis leur précédent article [7]. Ils s'intéressent à deux composantes principales de l'impulsivité : la sensibilité au stimuli alimentaires et les capacités d'inhibition comportementale face à l'alimentation. Les conclusions de cette rigoureuse revue de la littérature conduit les auteurs à poser l'hypothèse suivante : les patients obèses avec ou sans BED présenteraient une plus grande sensibilité au stimuli alimentaires mais les patients présentant conjointement un BED auraient plus de difficultés à inhiber les comportements d'approche envers l'alimentation. Malgré tout, les auteurs insistent sur certaines lacunes méthodologiques concernant de nombreuses recherches étudiant l'impulsivité chez les patients en surpoids (grande variabilité des images alimentaires présentées et non fonction des préférences du sujet, contrôle non systématique des niveaux de faim et de rassasiement avant les mesures d'impulsivité alimentaire, etc.).*

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