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Leptin Mediates the Relationship between Fat Mass and Blood Pressure

Fujita Y, Kouda K, Ohara K, et al. (2019) *Medicine* [1]

Animal studies have shown that leptin mediates the association between obesity and hypertension. However, only a few studies have assessed this relationship in population-based epidemiological studies. This study aimed to determine whether leptin mediates the relationship between body fat and blood pressure in school-aged children. A cross-sectional survey was conducted among school-aged children in Hamamatsu, Japan. Body fat was measured using dualenergy X-ray absorptiometry. Height-normalized index of fat mass (fat mass index) was calculated by dividing fat mass by height squared. Serum leptin levels were measured by enzyme-linked immunosorbent assay. Multiple regression analysis was used to evaluate relationships between body fat, serum leptin levels, and blood pressure. The mediating effect of leptin on the association between body fat and blood pressure was assessed by causal mediation analysis and regression analysis. Both fat mass index and leptin were significantly and positively associated with blood pressure. Fat mass index was also strongly associated with serum leptin levels. Body fat and blood pressure were no longer associated after adjusting for leptin. These findings suggest that the association between body fat and blood pressure is mediated by leptin. Of the total effect of fat mass

index on blood pressure, the mediating effect of leptin accounted for 78.6% ($P = .03$) in boys and 42.2% ($P = .11$) in girls. Our findings suggest that body fat is associated with blood pressure, and this association is mediated by leptin. Thus, leptin acts as a mediator that links body adiposity with blood pressure elevation in school-aged children.

Commentaires : L'obésité infantile est un facteur de risque majeur d'obésité à l'âge adulte et par conséquent le dépistage des complications dès l'enfance est capitale. Plusieurs études expérimentales sur des animaux ont mis en évidence une élévation de la pression artérielle suite à des injections de leptine. Des modèles d'hyperleptinémie (souris KKA(y)) développent même naturellement une hypertension artérielle (HTA). Les auteurs se penchent ici sur la question de l'HTA sur une cohorte de 400 enfants (âgés de 11,2 ans en moyenne). Dans la mesure où le poids et l'IMC ne reflètent en rien la composition corporelle, l'index de masse grasse mesuré en DEXA est pris en compte dans l'analyse. D'après les auteurs, une association significative est retrouvée entre HTA, index de masse grasse et leptine. Cette association disparaît après ajustement sur la leptine (car la leptinémie est directement corrélée à la quantité de tissu adipeux). Ainsi la leptine interagirait comme médiateur entre masse grasse et pression artérielle. Des études pour en comprendre la physiopathologie restent nécessaires...

Physical Activity Energy Expenditure and Total Daily Energy Expenditure in Successful Weight Loss Maintainers

Ostendorf D M, Caldwell A E., Creasy S A, et al. (2019) *Obesity* [2]

Objective: The objective of this study was to compare physical activity energy expenditure (PAEE) and total daily energy expenditure (TDEE) in successful weight loss maintainers (WLM) with normal weight controls (NC) and controls with overweight/obesity (OC).

Methods: Participants were recruited in three groups: WLM ($n = 25$, BMI 24.1 ± 2.3 kg/m²; maintaining ≥ 13.6 kg weight loss for ≥ 1 year), NC ($n = 27$, BMI 23.0 ± 2.0 kg/m²; similar to current BMI of WLM), and OC ($n = 28$, BMI

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$34.3 \pm 4.8 \text{ kg/m}^2$; similar to pre-weight loss BMI of WLM). TDEE was measured using the doubly labeled water method. Resting energy expenditure (REE) was measured using indirect calorimetry. PAEE was calculated as $(\text{TDEE} - [0.1 \times \text{TDEE}] - \text{REE})$.

Results: PAEE in WLM ($812 \pm 268 \text{ kcal/d}$, mean \pm SD) was significantly higher compared with that in both NC ($621 \pm 285 \text{ kcal/d}$, $P < 0.01$) and OC ($637 \pm 271 \text{ kcal/d}$, $P = 0.02$). As a result, TDEE in WLM ($2,495 \pm 366 \text{ kcal/d}$) was higher compared with that in NC ($2,195 \pm 521 \text{ kcal/d}$, $P = 0.01$) but was not significantly different from that in OC ($2,573 \pm 391 \text{ kcal/d}$).

Conclusions: The high levels of PAEE and TDEE observed in individuals maintaining a substantial weight loss ($-26.2 \pm 9.8 \text{ kg}$ maintained for 9.0 ± 10.2 years) suggest that this group relies on high levels of energy expended in physical activity to remain in energy balance (and avoid weight regain) at a reduced body weight.

Commentaires : L'étude des changements de dépense énergétique en fonction des variations de poids est passionnante car prédictive de la conduite à tenir afin de garantir un maintien de poids durable. Lors d'une perte de poids importante qu'elle qu'en soit l'origine, il est observé une réduction de la dépense énergétique totale journalière de part une diminution de la dépense énergétique de repos et liée à l'activité physique en raison de la diminution de la masse corporelle. Afin de garantir une stabilité pondérale face à cette diminution de dépense énergétique, la conduite à tenir consiste à maintenir une réduction des apports énergétiques ou à majorer les dépenses via l'activité physique. Les auteurs comparent ici chez 106 sujets, la dépense énergétique en calorimétrie indirecte d'un groupe de patients ayant perdu en moyenne 13,6 kg et maintenu depuis 1 an, à des contrôles normopondéraux et des contrôles en surpoids. La dépense énergétique liée à l'activité physique observée dans le groupe « maintien de perte de poids » est bien supérieure aux deux autres groupes et la dépense énergétique totale journalière n'est pas différente du groupe surpoids ! La clef pour garantir un équilibre de la balance énergétique sur le long terme après amaigrissement semble donc d'avantage liée à la dépense énergétique qu'à la réduction des apports. A confirmer sur des études longitudinales...

The impact of obesity in cognitive and memory dysfunction in obstructive sleep apnea syndrome

Shen YC, Kung SC, Chang ET, et al. (2019) Int J Obes [3]

Objective: Obstructive sleep apnea (OSA), a sleep disorder, results in decreased daytime alertness and neurocognitive dysfunction. Obesity is considered a major risk factor for the

development and progression of OSA and the resulting cognitive dysfunction. However, the effect of obesity on neurocognitive dysfunction in OSA has been rarely investigated.

Methods: Eighty-three patients with moderate to severe OSA syndrome were recruited in our study. After matching for education, age, and body mass index (BMI), 40 patients were enrolled into our study with matched obese (BMI ≥ 30) and non-obese (BMI < 30) groups. All enrolled patients completed a polysomnographic study, sleepiness questionnaires, and attention, cognitive, and memory function tests.

Results: Compared to obese OSA patients, non-obese OSA patients had shorter reaction times in the psychomotor vigilance task but not the Flanker or Stroop cognitive tasks. Additionally, obese OSA patients had a reduced capacity for working memory relative to non-obese OSA patients.

Conclusions: Obesity had a significant effect on OSA patients in our study, including delayed reaction times in the psychomotor vigilance task and a decrease in working memory.

Commentaires : Le syndrome d'apnées obstructives du sommeil (SAOS), à l'origine d'hypoxémie nocturne et de microréveils, est fréquent chez nos patients obèses dans la mesure où le surpoids est un facteur de risque pour cette pathologie. Il est bien établi que le SAOS conduit à des déficiences des fonctions cognitives, de mémorisation ou encore de l'attention mais ces déficiences sont indépendantes du niveau de sévérité du SAOS. Par contre, la littérature est très pauvre sur l'étude des fonctions neurocognitives des patients obèses présentant un SAOS. Les auteurs tentent de répondre à cette question en comparant les fonctions neurocognitives de 83 patients présentant tous un SAOS, obèses ou non. Les résultats sont sans équivoque : les patients obèses présentent un délai de réaction plus lent au test de vigilance ainsi qu'une mémoire de court terme moins performante comparé aux sujet SAOS non obèses. Cela rejoint le constat d'autres études attestant l'altération des fonctions neurocognitives chez le sujet obèse, avec des pistes d'étiologie notamment métaboliques.

Mobile Health Applications in Weight Management: A Systematic Literature Review

Dounavi K, Tsoumani O (2019) Am J Prev Med. [4]

Context: Weight management is an effective strategy for controlling chronic disease and maintaining physical health, and research on this topic has risen dramatically over the past four decades. The present systematic literature review aimed to identify existing evidence on the efficacy of mobile health technology in facilitating weight management behaviors, such as healthy food consumption and physical activity.

Evidence acquisition: A systematic search was conducted in Ovid MEDLINE and Ovid PsycINFO databases with the aim to identify studies published in peer-reviewed journal articles between 2012 and 2017.

Evidence synthesis: A total of 39 studies were analyzed in spring 2018 and are presented here in terms of participant characteristics, effective technology components, additional treatments, impact on health-related behaviors, and treatment efficacy. Indicators of study quality and social validity are also provided.

Conclusions: Mobile health apps are widely considered as satisfactory, easy to use, and helpful in the pursuit of weight loss goals by patients. The potential of mobile health apps in facilitating weight loss lies in their ability to increase treatment adherence through strategies such as self-monitoring. These findings indicate that satisfactory treatment adherence and consequent weight loss and maintenance are achieved in the presence of high levels of engagement with a mobile health app. The research quality assessment of RCTs reveals a great need for following international standards both when conducting and reporting research.

Commentaires : *Les applications mobiles peuvent-elles être un atout dans la prise en charge de l'obésité ? Cette revue de la littérature se penche sur ces outils de plus en plus répandus et présentant l'avantage de toucher une large population tout en permettant d'agir au plus proche des patients. Ces applications présentent de hauts degrés d'adhésion et semblent majoritairement efficaces pour faire évoluer le comportement alimentaire et le niveau d'activité physique. Au vu des avantages présentés par ces applications en termes d'accessibilité, il est peut-être temps pour les soignants spécialisés de se saisir de cette opportunité numérique. En effet, si l'adhésion à ces applications est importante, celle-ci est minorée chez les sujets présentant des troubles du comportement alimentaire et de haut niveau de craving alimentaire. Ainsi l'apport des spécialistes du domaine pourrait permettre de développer des contenus adaptés aux différents profils de patients obèses afin de proposer des accompagnements spécifiques.*

The Short Inventory of Grazing (SIG): Development and Validation of a New Brief Measure of a Common Eating Behaviour with a Compulsive Dimension

Heriseanu A. I., Hay P. et Touyz S. [2019] Int J Eat Disord. [5]

Background: Grazing, the repetitious and unplanned eating of small amounts of food with or without a sense of loss of control (LOC), is an eating pattern of recent interest which is highly prevalent in eating disorders and obesity. The current study aimed to (1) assess psychometric

properties of a short inventory of grazing (SIG), consisting of a “grazing in general” item and a “compulsive/LOC grazing” item and (2) examine associations between compulsive and non-compulsive grazing and body mass index (BMI), eating disorder psychopathology, distress and health-related quality of life.

Methods: Participants recruited from a university and the community ($n = 227$; 75.3% female; age = 25.00 (9.88; 17.58-57.17) years; BMI = 23.24 (4.91, 14.20-46.06) kg/m²) completed an online test battery including the SIG. Parametric and non-parametric statistics were computed to assess internal consistency, test-retest reliability and construct validity, to test associations between the SIG and the other study variables, and to examine between-group differences.

Results: The SIG demonstrated appropriate psychometric properties. Results indicated that both grazing in general and low-frequency LOC grazing are common; however, LOC grazing of moderate-severe frequency and/or associated with marked distress is unusual. Frequency of LOC grazing, but not grazing in general, was significantly associated with higher BMI, psychological distress, compensatory behaviours and lower mental health-related quality of life. The presence of compulsive grazing was also associated with eating disorder caseness and binge-type eating disorder diagnostic groups.

Conclusions: Results support the positioning of “compulsive” LOC grazing on a continuum of problematic eating. The SIG is a parsimonious measure of this eating pattern of emergent interest.

Commentaires : *Les auteurs présentent ici la validation d'un court questionnaire permettant d'évaluer le grignotage. Outre sa rapidité et sa facilité d'administration, cet outil présente l'avantage de faire la distinction entre le grignotage avec et sans perte de contrôle. Les résultats de cette étude mettent en évidence que les sujets rapportant du grignotage avec perte de contrôle rapporteraient des IMC supérieurs, des scores de qualité de vie moindres et une détresse plus marquée. Cette étude vient confirmer l'importance de la perte de contrôle dans l'évaluation de nos patients celle-ci semblant signifier plus sûrement le retentissement psychologique que la quantité effectivement ingérée [6,7]. Il serait intéressant de passer cet outil à l'épreuve de la validation en population clinique.*

Depression, Emotional Eating and Long-Term Weight Changes: A Population-Based Prospective Study

Konttinen H, van Strien T, Mannisto S, et al. [2019] Int J Behav Nutr Phys Act [8]

Background: Emotional eating (*i.e.* eating in response to negative emotions) has been suggested to be one mechanism

linking depression and subsequent development of obesity. However, studies have rarely examined this mediation effect in a prospective setting and its dependence on other factors linked to stress and its management. We used a population-based prospective cohort of adults and aimed to examine 1) whether emotional eating mediated the associations between depression and 7-year change in body mass index (BMI) and waist circumference (WC), and 2) whether gender, age, night sleep duration or physical activity moderated these associations.

Methods: Participants were Finnish 25- to 74-year-olds who attended the DILGOM study at baseline in 2007 and follow-up in 2014. At baseline ($n = 5024$), height, weight and WC were measured in a health examination. At follow-up ($n = 3735$), height, weight and WC were based on measured or self-reported information. Depression (Center for Epidemiological Studies - Depression Scale), emotional eating (Three-Factor Eating Questionnaire-R18), physical activity and night sleep duration were self-reported. Age- and gender-adjusted structural equation models with full information maximum likelihood estimator were used in the analyses.

Results: Depression and emotional eating were positively associated and they both predicted higher 7-year increase in BMI ($R^2 = 0.048$) and WC ($R^2 = 0.045$). The effects of depression on change in BMI and WC were mediated by emotional eating. Night sleep duration moderated the associations of emotional eating, while age moderated the associations of depression. More specifically, emotional eating predicted higher BMI ($P = 0.007$ for the interaction) and WC ($P = 0.026$, respectively) gain in shorter sleepers (7 h or less), but not in longer sleepers (9 h or more). Depression predicted higher BMI ($P < 0.001$ for the interaction) and WC ($P = 0.065$, respectively) increase in younger participants, but not in older participants.

Conclusions: Our findings offer support for the hypothesis that emotional eating is one behavioural mechanism between depression and development of obesity and abdominal obesity. Moreover, adults with a combination of shorter night sleep duration and higher emotional eating may be particularly vulnerable to weight gain. Future research should examine the clinical significance of our observations

by tailoring weight management programs according to these characteristics.

Commentaires : Cette rigoureuse étude longitudinale conduite durant sept années met en évidence que l'alimentation émotionnelle constituerait un processus expliquant le lien entre dépression et évolution pondérale. De plus, cette étude vient confirmer des résultats antérieurs marquant l'influence du sommeil sur cette médiation entre dépression et cinétique pondérale [9]. En effet, l'influence de l'alimentation émotionnelle entre dépression et évolution pondérale serait plus marquée chez les « petits dormeurs ». Les résultats de cette étude poussent à envisager des interventions prenant en charge l'alimentation émotionnelle (et les déficits de régulation dans le domaine) mais ouvre aussi la piste à d'autres accompagnements incluant la variable « sommeil ».

Références

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