



## High-protein-low-carbohydrate diet: deleterious metabolic and cardiovascular effects depend on age

Submitted by Emmanuel Lemoine on Tue, 02/24/2015 - 15:30

Titre	High-protein-low-carbohydrate diet: deleterious metabolic and cardiovascular effects depend on age
Type de publication	Article de revue
Auteur	Bedarida, Tatiana [1], Baron, Stephanie [2], Vessieres, Emilie [3], Vibert, Françoise [4], Ayer, Audrey [5], Marchiol-Fournigault, C. [6], Henrion, Daniel [7], Paul, J. L [8], Noble, F. [9], Golmard, J. L [10], Beaudeau, Jean-Louis [11], Cottart, Charles-Henry [12], Nivet-Antoine, Valerie [13]
Editeur	American Physiological Society
Type	Article scientifique dans une revue à comité de lecture
Année	2014
Langue	Anglais
Date	2014
Numéro	5
Pagination	H649 - 57
Volume	307
Titre de la revue	American Journal of Physiology - Heart and Circulatory Physiology
ISSN	1522-1539
Mots-clés	Age Factors [14], Animals [15], Aorta/metabolism/pathology [16], Blood Glucose/metabolism [17], Diet, Carbohydrate-Restricted/adverse effects [18], Dietary Proteins/administration & dosage/adverse effects [19], echocardiography [20], Glucose Intolerance/etiology/metabolism [21], Lipid Metabolism [22], Mesenteric Arteries/metabolism/pathology [23], Mice [24], Mice, Inbred C57BL [25], Myocardium/metabolism/pathology [26], Resistin/blood [27], Triglycerides/blood [28], Ventricular Dysfunction, Left/etiology/metabolism [29]

Résumé en anglais

High-protein-low-carbohydrate (HP-LC) diets have become widespread. Yet their deleterious consequences, especially on glucose metabolism and arteries, have already been underlined. Our previous study (2) has already shown glucose intolerance with major arterial dysfunction in very old mice subjected to an HP-LC diet. The hypothesis of this work was that this diet had an age-dependent deleterious metabolic and cardiovascular outcome. Two groups of mice, young and adult (3 and 6 mo old), were subjected for 12 wk to a standard or to an HP-LC diet. Glucose and lipid metabolism was studied. The cardiovascular system was explored from the functional stage with Doppler-echography to the molecular stage (arterial reactivity, mRNA, immunohistochemistry). Young mice did not exhibit any significant metabolic modification, whereas adult mice presented marked glucose intolerance associated with an increase in resistin and triglyceride levels. These metabolic disturbances were responsible for cardiovascular damages only in adult mice, with decreased aortic distensibility and left ventricle dysfunction. These seemed to be the consequence of arterial dysfunctions. Mesenteric arteries were the worst affected with a major oxidative stress, whereas aorta function seemed to be maintained with an appreciable role of cyclooxygenase-2 to preserve endothelial function. This study highlights for the first time the age-dependent deleterious effects of an HP-LC diet on metabolism, with glucose intolerance and lipid disorders and vascular (especially microvessels) and cardiac functions. This work shows that HP-LC lead to equivalent cardiovascular alterations, as observed in very old age, and underlines the danger of such diet.

URL de la notice

<http://okina.univ-angers.fr/publications/ua8269> [30]

DOI

10.1152/ajpheart.00291.2014 [31]

Lien vers le document

<http://dx.doi.org/10.1152/ajpheart.00291.2014> [31]

Titre abrégé

Am J Physiol Heart Circ Physiol

---

## Liens

- [1] [http://okina.univ-angers.fr/publications?f\[author\]=25527](http://okina.univ-angers.fr/publications?f[author]=25527)
- [2] [http://okina.univ-angers.fr/publications?f\[author\]=25528](http://okina.univ-angers.fr/publications?f[author]=25528)
- [3] <http://okina.univ-angers.fr/emilie.vessieres/publications>
- [4] [http://okina.univ-angers.fr/publications?f\[author\]=25529](http://okina.univ-angers.fr/publications?f[author]=25529)
- [5] [http://okina.univ-angers.fr/publications?f\[author\]=19134](http://okina.univ-angers.fr/publications?f[author]=19134)
- [6] [http://okina.univ-angers.fr/publications?f\[author\]=14041](http://okina.univ-angers.fr/publications?f[author]=14041)
- [7] <http://okina.univ-angers.fr/d.henrion/publications>
- [8] [http://okina.univ-angers.fr/publications?f\[author\]=13803](http://okina.univ-angers.fr/publications?f[author]=13803)
- [9] [http://okina.univ-angers.fr/publications?f\[author\]=14042](http://okina.univ-angers.fr/publications?f[author]=14042)
- [10] [http://okina.univ-angers.fr/publications?f\[author\]=14043](http://okina.univ-angers.fr/publications?f[author]=14043)
- [11] [http://okina.univ-angers.fr/publications?f\[author\]=25532](http://okina.univ-angers.fr/publications?f[author]=25532)
- [12] [http://okina.univ-angers.fr/publications?f\[author\]=25533](http://okina.univ-angers.fr/publications?f[author]=25533)
- [13] [http://okina.univ-angers.fr/publications?f\[author\]=25534](http://okina.univ-angers.fr/publications?f[author]=25534)
- [14] [http://okina.univ-angers.fr/publications?f\[keyword\]=10043](http://okina.univ-angers.fr/publications?f[keyword]=10043)
- [15] [http://okina.univ-angers.fr/publications?f\[keyword\]=964](http://okina.univ-angers.fr/publications?f[keyword]=964)
- [16] [http://okina.univ-angers.fr/publications?f\[keyword\]=13200](http://okina.univ-angers.fr/publications?f[keyword]=13200)
- [17] [http://okina.univ-angers.fr/publications?f\[keyword\]=13371](http://okina.univ-angers.fr/publications?f[keyword]=13371)
- [18] [http://okina.univ-angers.fr/publications?f\[keyword\]=13373](http://okina.univ-angers.fr/publications?f[keyword]=13373)
- [19] [http://okina.univ-angers.fr/publications?f\[keyword\]=13372](http://okina.univ-angers.fr/publications?f[keyword]=13372)
- [20] [http://okina.univ-angers.fr/publications?f\[keyword\]=10595](http://okina.univ-angers.fr/publications?f[keyword]=10595)
- [21] [http://okina.univ-angers.fr/publications?f\[keyword\]=13374](http://okina.univ-angers.fr/publications?f[keyword]=13374)

- [22] [http://okina.univ-angers.fr/publications?f\[keyword\]=8514](http://okina.univ-angers.fr/publications?f[keyword]=8514)
- [23] [http://okina.univ-angers.fr/publications?f\[keyword\]=13375](http://okina.univ-angers.fr/publications?f[keyword]=13375)
- [24] [http://okina.univ-angers.fr/publications?f\[keyword\]=1102](http://okina.univ-angers.fr/publications?f[keyword]=1102)
- [25] [http://okina.univ-angers.fr/publications?f\[keyword\]=1478](http://okina.univ-angers.fr/publications?f[keyword]=1478)
- [26] [http://okina.univ-angers.fr/publications?f\[keyword\]=12817](http://okina.univ-angers.fr/publications?f[keyword]=12817)
- [27] [http://okina.univ-angers.fr/publications?f\[keyword\]=13376](http://okina.univ-angers.fr/publications?f[keyword]=13376)
- [28] [http://okina.univ-angers.fr/publications?f\[keyword\]=13377](http://okina.univ-angers.fr/publications?f[keyword]=13377)
- [29] [http://okina.univ-angers.fr/publications?f\[keyword\]=13378](http://okina.univ-angers.fr/publications?f[keyword]=13378)
- [30] <http://okina.univ-angers.fr/publications/ua8269>
- [31] <http://dx.doi.org/10.1152/ajpheart.00291.2014>

Publié sur *Okina* (<http://okina.univ-angers.fr>)