Perspective

Open Access   CrossMark

Adipose tissue –liver axis: another significant issue in MAFLD disease

Michel Gonzalez Sanchez

Department of Bioethics, Family Medicine Specialist, University of Valencia, Cuba

Correspondence: Michel Gonzalez Sanchez, Department of Bioethics, Family Medicine Specialist, University of Valencia, Cuba, Tel+5355741215, Email michel91g@gmail.com

Abbreviations: VAT, visceral adipose tissue; TRL4+ Toll-like receptor 4; AT, adipose tissue; MH, metabolic health

Perspective

Metabolic fatty liver as an entity, has a heterogeneous behavior; both for its causes and for its evolution and natural history. Being determined and influenced by factors that can be modifiable and non-modifiable such as: age, ethnicity, obesity and metabolic Health, dietary intake, gut microbiota, bile acid and genetic factors.[1,2] The liver, as a vital organ play an important metabolic function and together with adipose tissue (AT) maintain a balance of macronutrients in the process from the uptake to storage. It is here that an important circuit is established that plays a crucial role: call adipose -liver axis.[3]

It is important to define and clarify, that the adipose tissue is an organ composed of subcutaneous deposits. Consequently, depending on the histological type of adipocyte (main cellular type) it can divide into white adipose tissue (WAT), brown adipose tissue (BAT) or mixed adipose tissue (MAT); made which would be determined in a certain way by: age, sex, genetic factors, environmental temperature and nutritional aspects.[4]

An important fact concerning adipose tissue is how it behaves in lean and obese adipose tissue. Significant difference are observed here since in lean individual there is a small insulin sensitivity adipocytes, while in obese individuals the rigidity of the adipose tissue is consistent with the increase in insulin sensitivity of connective fiber content. The basic function of adipocytes is to take up free fatty acids (FFA) from circulating lipoprotein complexes and esterify them into triacylglycerides.[5] During times of metabolic demand, hydrolysis of triacylglycerides releases FFA to generate adenosine triphosphate (ATP).[6] In essence AT secrets a wide variety of biomolecules known as adipokines. Here is the pathway by which the liver adipose axis is modulated: through this biomolecules.[7,8]

Franchito et al. in a study conducted on pediatric patients with fatty liver after laparoscopy sleeve gastrectomy concluded in this comparative study between the liver and visceral adipose tissue, (VAT) that the histological changes found in both; maintain a similar pattern even with a reduction in TRL4+ and adipocytokine profile modification.[9]

It is well known that type of adipose tissue growth, adipose tissue anatomical location, adipose tissue inflammation, ectopic fat accumulation, genetic factors, and lifestyles factors (Diet and physical activity) are determinant factors that can explain the metabolic features of MH subjects.[10]

Therefore, one of the determining factors of the prognostic and pathophysiology in MAFLD patients is determined by the pattern of metabolic health that the patient has, where the liver adipose axis plays a crucial role.

Acknowledgments

None.

Conflicts of Interest

Author declares there are no confits of interest.

Funding

None.

References

1. González Sánchez M. View of the Non–Alcoholic Fatty Liver in Non–Obese Patients from MAFLD Perspective. USA: E–CRONICON; 2022.

2. Eslam M, Sanyal AJ, George J, et al. A consensus driven Proposed nomenclature for metabolic associated fatty liver disease. *Gastroenterology*. 2020;158(7):1999–2014.

3. Duwaerst CC, Maher J. Macronutrients and adipose liver axis in obesity and fatty liver. *Cellular and Molecular Gastroenterology and Hepatology*. 2019;7(4):749–761.

4. AwaD AB, Bradford PG. Adipose Tissue and Inflammation. USA: CRC press; 2010. p. 318.

5. Large V, Peroni. Metabolism of lipids in human white adipocyte. *Diabetes Metab*. 2004;30(4):294–309.

6. Nielsen T, Jessen, Jørgensen. Dissecting adipose tissue lipolysis: Molecular regulation and implications for metabolic disease. *J Mol Endocrinol*. 2014;52(3):R199–R222.

7. De–Wei Ye, Xiang–Lu Rong, Ai–Min Xu . Liver–adipose tissue crosstalk: A key player in the pathogenesis of glucolipid metabolic disease. *Chin J Integr Med*. 2017;23(6):410–414.

8. Cornide–Petronio ME, Jiménez–Castro MB, Gracia–Sancho J. New Insights into the Liver–Visceral Adipose Axis During Hepatic Resection and Liver Transplantation. *Cell*. 2019;8(9):1100.

9. Franchito A, Carpino G, Alisi A. Contribution of the adipose tissue liver axis in pediatric patients with non–alcoholic fatty liver disease after laparoscopic sleeve gastrectomy. *J Pediatr*. 2020;216:117–127.e2.

10. Parker. The role of adipose tissue in fatty liver diseases. *Liver Res*. 2018;2(1):35–42.