

Association of Gender Difference to Platelet Count (PC), Mean Platelet Volume (MPV) and Platelet Distribution Width (PDW) Levels in Non-alcoholic Fatty Liver Disease (NAFLD) Patients

Sir,

The pathogenesis and the driving factors of NAFLD are not discrete, many studies have confirmed that NAFLD is a disease with sexual dimorphism, but there are still many clinical studies that do not pay enough attention to this gender differentiation. The peripheral platelet (PLT) production is mainly regulated by thrombopoietin, which is a glycoprotein hormone predominantly synthesised in the liver.¹ A study from Iran reported that PC in NAFLD can serve as a clue to the severity of disease. Male patients with abnormal levels of alanine aminotransferase (ALT) had higher platelet counts.² Ginevra *et al.* also reported that the number of platelets in old age were reduced by 35% in men and by 25% in women with respect to early infancy.³ However, the mechanism related to gender difference is not completely clear. *In vitro* and *in vivo* studies have found that estrogen is beneficial for the formation of PLT in mice. The production of megakaryocytes and PLT is also influenced by endogenous estrogen. Coincidentally, the incidence of NAFLD is also significantly different when we compare both the genders.⁴ It is not clear whether there are intrinsic links between these two phenomena.

We analysed difference of platelet count and its morphological features with account of gender differentiation in NAFLD patients. Results showed that the level of PC in male was significantly lower than that in female, and further decreased with age (Figure 1). The level of PC in female decreased significantly in the 30-59 age group, while PDW increased significantly during this age stage. Previous studies have explored the relationship between MPV and NAFLD, they found that patients with NAFLD had higher MPV, and it might have prognostic value in NAFLD patients indicating increased cardiovascular disease (CVD) risk.⁵ But, gender difference has not been reported yet. We found that MPV increased with age in female patients, but did not change in male patients; this may be due to the possibility that the female ability to adapt to PC reduction by changes in platelet function is more pronounced than male. PC, MPV and PDW levels of NAFLD patients with different BMI and fibroscan CAP (Controlled attenuation parameter) levels were also analysed, results showed that male obese patients ($BMI \geq 28 \text{ kg/m}^2$) had lower PC levels, but not so in female patients. With the

increase of CAP value, MPV of males increased significantly; whereas, females did not show significant increase. PDW of female increased while male patients had no such increase. In CAP >292 group, the level gap of PC between the genders disappeared. This phenomenon needs further studies to explain the cause.

In conclusion, gender differences of platelet count and morphological features exist in NAFLD patients. Gender factors should be considered while analysing their correlation with NAFLD.

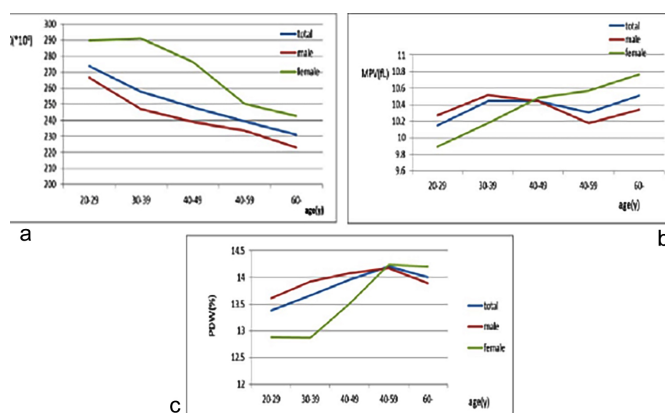


Figure 1: Comparison of PC, MPV and PDW among NAFLD patients of different ages. (a) Trend of PC with age in male and female NAFLD patients. (b) Trend of MPV with age in male and female NAFLD patients. (c) Trend of PDW with age in male and female NAFLD patients.

CONFLICT OF INTEREST:

Authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

HL: Data analysis and manuscript writing.

JJ: Research design, data analysis, article modification.

REFERENCES

1. Fang Liu, Hui Zhou, Lei Cao, Zhirong Guo, Chen Dong, Lugang Yu, *et al.* Risk of reduced platelet counts in patients with nonalcoholic fatty liver disease (NAFLD): A prospective cohort study. 2018; **17(1)**:221. doi: 10.1186/s12944-018-0865-7.
2. Garjani A, Safaeiyan A, Khoshbaten M. Association between platelet count as a noninvasive marker and ultrasonographic grading in patients with nonalcoholic fatty liver disease. *Hepat Mon* 2015; **15(1)**:e24449. doi: 10.5812/hepatmon.24449.
3. Biino G, Santimone I, Minelli C, Sorice R, Frongia B, Traglia M, *et al.* Age- and sex-related variations in platelet count in Italy: A proposal of reference ranges based on 40987 subjects' data. *PLoS One* 2013; **8(1)**:e54289. doi: 10.1371/journal.pone.0054289.
4. Lonardo A, Trande P. Are there any sex differences in fatty liver? A study of glucose metabolism and body fat distribution. *J Gastroenterol Hepatol* 2000; **15(7)**:775-82. doi: 10.1046/j.1440-1746.2000.02226.x.

5. Ozhan H, Aydin M, Yazici M, Yazgan O, Basar C, Gungor A, et al. Mean platelet volume in patients with non-alcoholic fatty liver disease. *Platelets* 2010; **21(1)**:29-32. doi: 10.3109/09537100903391023.

Hui Li² and Jian Jiao¹

¹Department of Dentistry, China-Japan Union Hospital of Jilin University, Changchun, China

²Department of Gastroenterology and Hepatology, China-Japan

Union Hospital of Jilin University, Changchun, China

Correspondence to: Dr. Jian Jiao, Department of Gastroenterology and Hepatology, China-Japan Union Hospital, Jilin University, Changchun, China
E-mail: jjian@jlu.edu.cn

Received: February 02, 2020; Revised: April 20, 2020;
Accepted: May 15, 2020

DOI: <https://doi.org/10.29271/jcpsp.2021.01.115>

• • • • •