Arch Clin Infect Dis. 2020 April; 15(2):e103136. doi: 10.5812/archcid.103136.

Published online 2020 April 22. **Letter**

Possible Overlap of Laboratory Findings Between Patients with COVID-19 and Substance Use Disorders

Ali Farhoudian [1, 2], Pardis Nematollahi [3, *], Mandana Sadeghi [4] and Seyed Ramin Radfar [2, 5]

[1] Department of Psychiatry, Tehran University of Medical Sciences, Tehran, Iran
[2] Substance Abuse and Dependence Research Center, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran
[3] Cancer Prevention Research Center, Isfahan University of Medical Sciences, Isfahan, Iran
[4] Aftab Mehrvarzi Substance Abuse Treatment Center, Tehran, Iran
[5] Integrated Substance Abuse Programs, University of California, Los Angeles, Los Angeles, CA, USA

[*] *Corresponding author*: Cancer Prevention Research Center, Isfahan University of Medical Sciences, Isfahan, Iran. Email: pardis.nematolahy@med.mui.ac.ir

Received 2020 March 28; **Accepted** 2020 April 17.

Keywords: COVID-19, People Who Use Drug, Coronavirus, Substance, Laboratory Findings, PWUD

Dear Editor,

It is important that clinicians must be aware of possible overlap of the laboratory-based blood tests in people who use drugs (PWUD) and patients with coronavirus disease 2019 (COVID-19) to avoid overlooking or over-diagnosis of patients.

The most common blood findings of the COVID-19 are lymphopenia (75.9%), leukopenia (31.1%), thrombocytopenia (32.8%), while elevated lactate dehydrogenase (45.9%), aspartate aminotransferase (AST) (24.6%), alanine aminotransferase (ALT) (22.4%), creatinine kinase (CK) (14.7%) and C-reactive protein (CRP) (1, 2). There is also a suggestion that lymphopenia due to decreases in both CD4+ and CD8+ T cells might be a critical factor associated with COVID-19 severity and mortality (3). Overlap of laboratory findings between PWUD and patients with COVID-19 is noticeable and should be considered in the clinical management of patients.

Among COVID-19-infected patients, lymphopenia is the most common finding in the complete blood count (CBC) test (1, 2). Lymphopenia could be an overlapped result among PWUD and COVID-19-infected patients. This may be due to T lymphocyte involvement in drug users owing to the expression of all three kinds of opioid receptors on T cells (4). Lymphopenia can sometimes be seen in cocaine, amphetamine, and opioid users (4-6). Another similar feature in laboratory tests is a finding of eosinopenia, which is a more reliable and specific laboratory predictor of COVID-19 than lymphopenia (7). It is important to know that eosinopenia is seen in opiate addicts during opioid abstinence (8, 9).

The angiotensin-converting enzyme (ACE) II receptor that is highly expressed on alveolar type II epithelial cells and bile duct cells, is also the receptor of COVID-19, causing the high pathogenic capacity of COVID-19 for liver damage with abnormal liver function in almost one-half of patients (10). This is also a common finding among PWUD undergoing methadone maintenance treatment (11). One study revealed that half of the MMT individuals after 24 months exhibited elevated alkaline phosphatase (ALP) levels, abnormal AST, and ALT levels (12). One of the other parameters for the evaluation of patients with COVID-19 is blood oxygen saturation that is low in some patients (13). This symptom could also be seen among smokers (14).

In the presence of COVID-19, clinicians must be aware of the possible overlap of the tests mentioned above in drug users and patients with COVID-19 to avoid overlooking or over-diagnosis of patients.

Footnotes

Authors' Contribution: AF, MS, and SRR first shared idea; PN prepared the first draft; all of the authors participated in finalizing the manuscript.

Conflict of Interests: No conflict of interest was declared.

Funding/Support: None declared by authors.

References

1. Lin W, Wen J, Chen G. Epidemiological and clinical characteristics of SARS-CoV-2 and SARS-CoV: a system review. *medRxiv*. 2020.
2. Zu ZY, Jiang MD, Xu PP, Chen W, Ni QQ, Lu GM, et al. Coronavirus Disease 2019 (COVID-19): A Perspective from China. *Radiology*. 2020:200490.

3. Xu Z, Shi L, Wang Y, Zhang J, Huang L, Zhang C, et al. Pathological findings of COVID-19 associated with acute respiratory distress syndrome. *The Lancet Respiratory Medicine*. 2020.
4. Liang X, Liu R, Chen C, Ji F, Li T. Opioid system modulates the immune function: a review. *Translational perioperative and pain medicine*. 2016;**1**(1):5.
5. Jankowski MM, Ignatowska-Jankowska B, Glac W, Swiergiel AH. Cocaine administration increases CD4/CD8 lymphocyte ratio in peripheral blood despite lymphopenia and elevated corticosterone. *International immunopharmacology*. 2010;**10**(10):1229–34.
6. Zaparte A, Schuch JB, Viola TW, Baptista TA, Beidaki A, Prado CH, et al. Cocaine Use Disorder Is Associated With Changes in Th1/Th2/Th17 Cytokines and Lymphocytes Subsets. *Frontiers in immunology*. 2019;**10**:2435.
7. Li Q, Ding X, Xia G, Geng Z, Chen F, Wang L, et al. A simple laboratory parameter facilitates early identification of COVID-19 patients. *medRxiv*. 2020.
8. Bewley TH. Forensic medicine and toxicology: drug addiction. *British medical journal*. 1967;**3**(5565):603.
9. Blachly PH. Management of the opiate abstinence syndrome. *American Journal of Psychiatry*. 1966;**122**(7):742–4.
10. Fan Z, Chen L, Li J, Tian C, Zhang Y, Huang S, et al. Clinical Features of COVID-19 Related Liver Damage. *medRxiv*. 2020.
11. Ferrari A, Coccia CPR, Bertolini A, Sternieri E. Methadone—metabolism, pharmacokinetics and interactions. *Pharmacological Research*. 2004;**50**(6):551–9.
12. Eslami-Shahrbabaki M, Haghdoost AA, Mashaiekhi A, Khalili N, Amini-Ranjbar Z, Ghayomi A. Effects of methadone on liver enzymes in patients undergoing methadone maintenance treatment. *Addiction & health*. 2012;**4**(3-4):111.
13. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. *Jama*. 2020.
14. Özdal M, Pancar Z, Çinar V, Bilgiç M. Effect of smoking on oxygen saturation in healthy sedentary men and women. *EC Pulmonology and Respiratory Medicine*. 2017;**4**(6):178–82.