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CORRESPONDENCE

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Increased Amylase and Lipase in Patients With COVID-19 Pneumonia: Don't Blame the Pancreas Just Yet!



Dear Editors:

We have read with interest the article entitled "Pancreatic injury patterns in patients with COVID-19 pneumonia" by Dr Wang and colleagues.¹ This was a retrospective study involving 52 patients with Coronavirus Disease 2019 (COVID-19) admitted to the Zhongnan Hospital of Wuhan University, China. It aimed to describe the incidence of pancreatic injury in patients with COVID-19, defined as any abnormality in amylase or lipase. Based on this, 17% of patients with COVID-19 met criteria for pancreatic injury. The mean level of amylase in patients with "pancreatic injury" was 115 ± 25 U/L (upper limit of normal [ULN] 90) and, in the case of lipase, 71 ± 34 U/L (ULN 70). We aimed to highlight that the definition of pancreatic injury in this article lacks specificity, as a mild increase in blood levels of pancreatic enzymes (PEs) can be explained by many factors other than pancreatic damage in patients with COVID-19.

Blood levels of amylase and lipase are the result of a balance between production and clearance of these enzymes. Amylase allows us to digest starch; it is mainly secreted by the pancreas and salivary glands, but other organs,² including the normal and diseased lungs,³ are also potential sources. Amylase is cleared by the reticuloendothelial system and the kidneys.² Lipase, which is mostly secreted in adults by the pancreas, is a key enzyme for the digestion of triglycerides. Lipase is excreted by the kidneys.² The standard definition for acute pancreatitis (which refers to clinically relevant pancreatic injury), requires, according to the Revised Atlanta Classification, at least 2 of the following 3 features: (1) typical abdominal pain; (2) serum amylase and/or lipase activity at least 3 times >ULN; and (3) characteristic findings of acute pancreatitis on contrast-enhanced computed tomography and less commonly, magnetic resonance imaging or transabdominal ultrasonography.⁴ The article did not provide data on imaging techniques or abdominal pain, which are crucial for diagnosing pancreatitis in patients with elevations of PEs within the 3-fold ULN threshold.

Patients with COVID-19 may incur a series of complications that are associated with elevated blood levels of PE, including acidosis,² renal failure,^{2,5} and diabetes.⁵ Furthermore, severe acute respiratory syndrome coronavirus 1, the predecessor of COVID-19, was found to affect the epithelial lining of salivary gland ducts early in the course of disease in monkeys.⁶ This may be of relevance as salivary glands are another recognized source of blood amylase.²

Finally, according to a recently published meta-analysis of patients with COVID-19, 50% had detectable severe acute respiratory syndrome coronavirus 2 RNA in stool samples and 18% had gastrointestinal symptoms.⁷ Gastroenteritis is a well-known cause of raised PEs,⁸ and may be explained by the enhanced intestinal permeability in response to inflammation, which facilitates reabsorption of macromolecules such as amylase and lipase.² In the article by Wang and colleagues,¹ patients classified as having pancreatic injury had a higher incidence of diarrhea and higher levels of creatinine, suggesting that the source of increased PE, at least in part, may have been due to gut inflammation and impaired renal excretion.

We suggest that future studies investigating the incidence of pancreatic inflammation on patients with COVID-19 should rely on imaging, preferably computed tomography scan or magnetic resonance imaging, as an objective test of clinically relevant pancreatitis in such patients with elevated blood levels of PEs.

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Conflicts of interest

The authors disclose no conflicts.

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