Abstract

Purpose. The aim of the first study was to determine the connection between COVID-19 infection and peripancreatic changes distinguishable on CT examination, as a sign of acute pancreatic involvement. The aim of the second study was to determine clinical, imaging and laboratory features in adult patients with acute pancreatitis related to COVID-19 infection.

Methods. For the first study, we used our hospital database to search for all the patients who were admitted and hospitalized between April 1st, 2020, and November 30th, 2020, who had a confirmed COVID-19 infection using a PCR test and at the same time underwent a CT scan during hospitalization. For this group of patients, we subsequently found a control group of patients of the same age and gender, who were hospitalized in our hospital during the same period, underwent a CT scan, but did not test positive for COVID-19. On the CT scans performed, we evaluated the signs of peripancreatic changes such as oedema, stranding of peripancreatic fat, (peri)pancreatic fluid collections or necrosis. In the second study, we searched the PubMed, Web of Science, Scopus and Cohrane Library databases for articles dealing with acute pancreatitis and COVID-19 infection, which were published from January 2020 to January 2021. In the final analysis, we included cases of COVID-19 infections confirmed by PCR test or antigen test, cases including data on age, sex, symptoms, laboratory values, results of imaging, at the same time excluding other possible common causes of pancreatitis.

Results. In the first study, we evaluated 103 patients with confirmed COVID-19 infection, of whom 58 had a CT scan performed in which the entire pancreas was captured, and 45 had at least two anatomical parts of the pancreas captured. We found peripancreatic fat stranding or fluid collection in 10 (10 %) patients, of whom 40 % reported abdominal complaints and 50 % had elevated amylase or lipase levels. Lung parenchyma was visible on CT in 102 of 103 patients, of whom 57 (55 %) had a typical appearance of covid pneumonia. In the control group, we found peripancreatic changes in only 2 (2 %) patients. In the second study, we summarized available articles on patients with COVID-19 - related pancreatic injury. There is a high association of gastrointestinal symptoms (diarrhea, vomiting, nausea, anorexia) and COVID-19, which was present in 73 % of patients. However, the etiology of pancreatitis is unknown in the majority (69 %) of patients with COVID-19. Also, patients infected with COVID-19 may show elevated serum levels of pancreatic enzymes, or have

signs of pancreatitis on imaging, but may not meet the diagnostic criteria for acute pancreatitis.

Conclusions. Our first study demonstrated that the prevalence of peripancreatic stranding, or fluid collections is higher in patients diagnosed with COVID-19 compared to a control group. Our second study shows that acute pancreatitis may be the first symptom of a COVID-19 infection. Pancreatic involvement in patients with COVID-19 has been explained by two mechanisms, a cytotoxic mechanism as well as a mediated immune response, indicating a bimodal sequence of pancreatic involvement in COVID-19 infection.

Keywords: *computed tomography, pancreas, COVID-19, acute pancreatitis*