

Zinc deficiency in patients with chronic pancreatitis

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According to our data, zinc deficiency is relatively common in patients with CP and is significantly associated with higher age, smoking and the number of pack-years, and is present in patients with and without pancreatic exocrine insufficiency

Background: Zinc is a key element in numerous proteins and plays a pivotal role in several essential cell functions such as cell proliferation and apoptosis, defense against free radicals, and DNA damage repair. Chronic pancreatitis is a chronic inflammation of the pancreas with a progressive fibrosis ultimately resulting in pancreatic exocrine insufficiency (PEI), which is associated with malnutrition. Studies analyzing zinc levels in patients with CP are sparse and lead to conflicting results. We are presenting data from the largest study so far investigating serum zinc levels in relation to different etiological groups of CP.

Aim: To determine serum zinc levels in relation to different etiological groups of CP.

Materials and method

Between October 2015 and March 2018, patients with a diagnosis of CP were identified and recruited from the Pancreatic Outpatient Clinic at the Karolinska University Hospital in Stockholm, Sweden. Demographic, clinical and laboratory data were analyzed. Pancreatic exocrine function was defined as normal (fecal elastase 1 >200 µg/g), mildly reduced (100-200 µg/g) and severely reduced (fecal elastase 1 <100 µg/g).

Results: A total of 150 patients were included in the analysis. Zinc deficiency (<11 µmol/L) was present in 39 (26.0%) of patients: 22 females and 17 males. In the group of patients with zinc deficiency, 76.7% of patients had an exocrine pancreatic insufficiency (FE-1 <200 µg/g). Older age was significantly associated with low zinc levels. Following a univariate analysis, patients aged 60-69 and patients ≥70 years of age had a significantly higher prevalence of zinc deficiencies compared to patients <40 years of age (OR: 3.8, [95CI (1.08-13.4); p=0.04]); (OR 6.26, [95CI (1.94-20.2)], p>0.002).

Smoking and number of pack-years were additionally associated with low zinc levels. The risk of zinc deficiency in current smokers and smokers with ≥20 pack-years was approximately three times higher compared to those who had never smoked.

Gender, body mass index (BMI), etiology of CP, presence of diabetes mellitus (DM), levels of glycated hemoglobin (HbA1c), bone mineral density, alcohol intake and presence of PEI were not associated with low zinc levels.

This is the first study to analyze the prevalence and risk factors of zinc deficiency in a large number of patients with different etiologies of CP.