Hypercholesterolemia, as a Predictor Factor of Severe Acute Pancreatitis

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Abstract

Dyslipidemia constitutes a well-known factor that can lead to acute pancreatitis. Hypertriglyceridemia and hypercholesterolemia are part of dyslipidemia. In a prospective study, we analyzed the role of hypercholesterolemia in triggering episodes of acute pancreatitis and the capacity of cholesterol blood level to predict the severity and the evolution of acute pancreatitis.

In our prospective study, a preexistent cholesterol blood level above 240 mg/dl proved to be a trigger for pancreatitis and an increasing cholesterol level in evolution predicts a pancreatitis with organ failure (moderately-severe or severe).

Keywords: hypercholesterolemia, acute pancreatitis, severe pancreatitis

INTRODUCTION

Acute pancreatitis is a potentially severe disease that could lead to multiple organ dysfunction or failure. In our surgical clinic we observed lately an increasing number of patients with acute pancreatitis, and, among them, the rate of moderately-severe and severe outcome has become higher. These forms are classified according to Acute Pancreatitis Classification Working Group, held...
in Atlanta, in 2012, that introduced a new concept, of moderately-severe pancreatitis, compared to the initial classification from 2007\textsuperscript{1-3}. Severe acute pancreatitis (pancreatitis with unique or multiple persistent organ failure - over 48 hours) is responsible of approximately 15% from all acute pancreatitis. The mortality of this form is 7-10\%\textsuperscript{4,5}.

Moderately-severe pancreatitis means acute pancreatitis with transient organ failure, under 48 hours.

The most common causes of acute pancreatitis are: gallstones, alcohol consumption, dyslipidemia, iatrogenic pancreatitis, posttraumatic or postoperative.

Measuring cholesterol level is an effective method for identifying individuals with elevated triglyceride levels. Individuals with severe hyper-triglyceridemia have a substantially higher risk for developing coronary heart disease and acute pancreatitis than individuals with lower triglyceride levels\textsuperscript{6,7}.

There are discussions in the literature whether hypercholesterolemia in some specific cases is a trigger of a consequence of acute pancreatitis. We analyzed only the patients with a preexistent determination of total cholesterol level.

**RESULTS AND DISCUSSIONS**

From the 237 patients, there were 149 men and 88 women (Figure 1).

The disposition of age groups shows a predilection of onset at over 50 years for women (mean age for women in our study was 74.7 years) and over 30 years of age for men (mean age 58.3). The later onset for women could be explained by estrogen levels and the higher incidence of dyslipidemia and hypercholesterolemia after menopause\textsuperscript{8,9}. We excluded a case of a pregnant woman\textsuperscript{10}.

The diagram of age groups can be seen on Figure 2.

The mean value of total cholesterol blood level at admission was 241 mg/dl. The mean values are different between men and women (higher for men 249 mg/dl vs. 237 mg/dl for women).

From all the 237 patients included in study, a number of 206 patients (87\%) had total blood cholesterol level above 240 mg/dl at admission time. This could be...
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considered a cut-off value for increased risk of developing acute pancreatitis. Comparing the results, a study form Spain found that prevalence of hypercholesterolemia ranged from 50 to 84% in diabetics, 64-74% with coronary heart disease, 40-70% in stroke patients, and 60-80% in those with peripheral artery disease. A prevalence of 87% is above all these conditions. Some studies for hypercholesterolemia in general population found levels between 20% and 60%, depending on alimentary habits and direct correlated with obesity.

We could not find any other triggers that could be involved in ethiopathogeny of the patients from the study.

Severe acute pancreatitis developed in 21 cases (8.86%) and moderately-severe in 17 cases (7.17%) (Figure 3). The most encountered organ failures were renal, pulmonary and hepatic. Some cases had pancreatic encephalopathy, which seems to be more related to toxic (alcohol) induced pancreatitis than biliary or dyslipidemic ones.

Together, moderately-severe and severe pancreatitis are responsible for 16% of cases, data concordant to literature (approximately 20% [1]). The mortality was 11.7% for moderately-severe form (2 cases), respectively 23.8% (5 patients) with severe pancreatitis, comparable with that mentioned in literature. All the 5 patients that died of severe pancreatitis had increased abdominal pressure.

We compared the cholesterol blood levels in day 3 and day 7 to the admission value for patients with mild pancreatitis, on one hand, and for patients that developed moderately-severe and severe forms, on the other hand. We did not found any major changes in cholesterol levels, in evolution of patients with mild form of disease.

For the group of patients with organ failure, no matter of organ failure persistence, we found an increased value of cholesterol level with a mean rate of 21% at day 3 and 53% at day 7. So, increasing values of total blood cholesterol in evolution of patients with acute pancreatitis can predict an evolution to severity. This is concordant to some studies in literature.

An elevated cholesterol level at admission was not associated with increased mortality in our cohort, which is in accord with the findings of some recent meta-analysis regarding triglycerides levels.

CONCLUSIONS

Hypercholesterolemia is a trigger for acute pancreatitis. A blood level over 240 mg/dl could be considered a risk factor.

Increasing values of cholesterol blood levels during evolution predicts an poor outcome and an evolution to organ failure (transient - moderately-severe pancreatitis or persistent - severe pancreatitis) with high mortality.

Compliance with ethics requirements: The authors declare no conflict of interest regarding this article. The authors declare that all the procedures and experiments of this study respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2008(5), as well as the national law. Informed consent was obtained from all the patients included in the study.

References


Figure 3. Forms of pancreatitis.