Malnutrition and antioxidant status in acute and chronic pancreatitis

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Introduction

Acute pancreatitis (AP) is a hypermetabolic inflammatory disorder accompanied with high protein catabolism and increased energy requirements. The catabolic stress and absence of oral intake increase the risk of protein-calorie malnutrition (PCM). In chronic pancreatitis (CP) progressive pancreatic enzyme insufficiency causes maldigestion and nutrient deficiencies.

Oxygene free radicals have been involved in the development and progression of acute and chronic pancreatitis. Depletion of antioxidants in these patients may impair recovery and increase the risk of complications.

We measured antioxidant status and the incidence of protein malnutrition evaluating different serum biomarkers in patients with acute and chronic pancreatitis.

Patients and Methods

Patients data	Acute pancreatitis (AP) n = 40	Chronic pancreatitis (CP) n = 45	Control group n = 20
Etiology Alcohol	18	29	
Biliary	17	11	
Other	5	5	
Age (years)	27 - 83	19 - 72	28 - 67
Male/female	25/15	32/13	12/8
BMI (kg/m²)	24,7 (18,7-31,5)	22,6 (13,7-27,7)	26,8 (20,3-29,2)
CRP (mg/dl)	45 - 497	0,1 - 85	
Severity	Severe: 9 Moderate: 31		

	Acute pancreatitis	Chronic pancreatitis
Treatment	Jejunal feeding from 1. day 2000-1500 kcal/day (Nutrison Standard, Nutricia)	Pancreatic enzyme supplementation Diet

In AP on admission, day 7. and 14. and in CP at control examinations determination of:

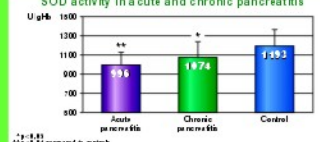
Antioxidant status
Superoxide Dismutase SOD activity (washed erythrocytes)
Total antioxidant status TAS (serum)

Protein status
Serum albumin, prealbumin and transferrin concentration

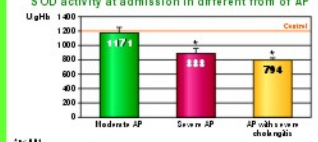
Standard laboratory tests (C-reactive protein)

Antropometry body weight and height - BMI

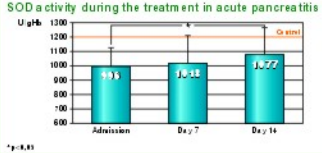
SOD activity in acute and chronic pancreatitis



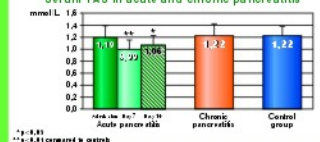
SOD activity at admission in different from of AP



SOD activity during the treatment in acute pancreatitis

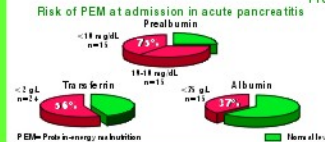


Serum TAS in acute and chronic pancreatitis

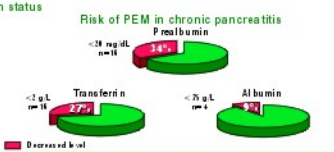


Protein status

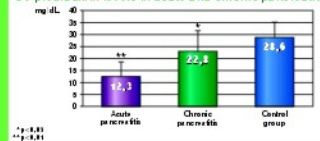
Risk of PEM at admission in acute pancreatitis



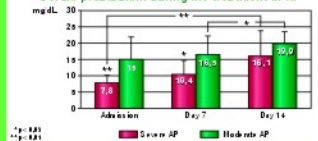
Risk of PEM in chronic pancreatitis



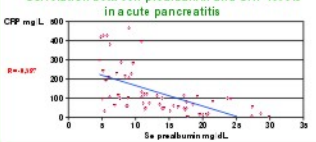
Se prealbumin levels in acute and chronic pancreatitis



Serum prealbumin during the treatment in AP



Correlation between prealbumin and CRP levels in acute pancreatitis



Protein status in acute and chronic pancreatitis

Serum biomarkers	Acut pancreatitis Admission	Day 7	Day 14	Chronic pancreatitis Alcoholic	Other
Prealbumin (mg/dL)	12,3[a] ±6,3	14,8 ±5,9	18,1[a] ±6,3	18,5[b] ±8,3	30,2[b] ±5,7
Albumin (g/L)	35,4 ±5,3	34,5 ±4,6	36,2 ±5,7	40,2 ±7,3	42,9 ±5,5
Transferrin (g/L)	1,75 ±0,55	1,62 ±0,65	1,82 ±0,62	2,27[c] ±0,43	2,49[c] ±0,16

Values marked with the same letter differ significantly from each other:
a-a: $p<0.05$ b-b: $p<0.01$

Results

- The SOD activity was significantly decreased in acute and chronic pancreatitis. In AP serum TAS were depleted during the treatment.
- Prealbumin concentrations provided the earlier and more accurate assessment of proteins status than the other markers.
- Prealbumin correlated to severity of disease and inflammation in AP.
- Malnutrition developed more frequently in alcohol related pancreatitis.
- Jejunal feeding prevented nutritional deterioration in AP.

Conclusions

Serum prealbumin seems to be a sensitive biomarker of protein status and of inflammation severity.

These data call for our attention to reconsider the nutritional support and antioxidant treatment of patients with acute and chronic pancreatitis

References

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