- TRANSLATION FROM ROMANIAN LANGUAGE -

THE AMYLASE AS ENZYME MARKER IN ACUTE PANCREATITIS

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Abstract

The determining of the pancreatic enzymes in the blood and urine represents the primordial diagnosis tests, being considered suggestive the values that are 3 time over the normal reference values. The sero amylase is a sign of great diagnosis value and most often used but not constant and temporary, it increases in the first 24 hours and reaches to the highest value at 24 hours from the debut, and afterwards it can return gradually in 5-7 days to normal. The amylasuria increases after the amylase blood level and the recovery is belated, but anyway, both parameters have a fast temporal evolution at least compared to hemolipase. The report amylasuria/ amylase blood level over 5, is highly suggestive for a pancreatitis. The presence of amylases in the serum overflows signify severe forms of those with alcoholic etiology. The amylasuria increases after the amylase blood level and the recovery is belated, but anyway, both parameters have a fast temporal evolution at least compared to hemolipase. The report amylasuria/ amylase blood level over 5, is highly suggestive for a pancreatitis. The presence of amylases in the serum overflows signify severe forms of disease, the evacuation of these overflows having a diagnosis purpose and a therapeutical one. The diagnosis value of the amylase batching is scarce from many reasons. The specificity is reduced, existing increases of the values in other forms of acute abdomen (perforated ulcer, intestinal occlusions, intestinal infarct, acute cholecystitis , etc.) or in the presence of some amylase tumors effused (ovarian, gastric, pulmonary cancers, medullosuprarenoma, multiple myeloma). Also, the concentrations remain normal in 10-30% of the cases, especially in alcoholic Acute pancreatitis, where the hypertriglyceridemia reduces the sensitivity of the method and there is a dissociation of the values in the serum and in the urine due to the delay of the glomerular filtering by prerenal kidney failure. The increase of the amylase blood level is more reduced in chronic pancreatitis. Moreover, the batching of the amylases is without a prognosis value because they don't participate to the production of the injuring process.

Keywords: amylase blood level, biochemical explorations, enzymes marker

INTRODUCTION

The clinical aspects in acute pancreatitis can vary starting from the slight forms, apparently atypical, to the severe forms (Botoi G., 2009; Anderson R., et al, 2000).

Many times the clinical picture is incomplete. Even when it is from an abdominal drama accompanied by a condition of shock the sensitivity of the singular clinical examination in declaring the diagnosis of Acute Pancreatitis is not over 40% (Anderson R., 2000; Bryce T., 1998; Paterson R et al, 2000). As a consequence, the supposition of Acute Pancreatitis

declared on the basis of the clinical examination has to be argued and supported by biochemical explorations and paraclinical investigations (Renzulli P, et al, 2005; Sharif R, et al, 2009).

The determining of the pancreatic enzymes in the blood and urine represents the primordial diagnosis tests, being considered suggestive the values that are 3 time over the normal reference values (Robert R., 2008; Venneman I. et al,1993 ; Wang X.D., et al., 1996;).

MATERIAL AND METHODS

In order to accomplish the objectives proposed was used a prospective study.

In this regard was created a lot of 45 patients with acute pancreatitis diagnosis. The patients come from the surgical wards of the Clinical County Emergency Hospital from Oradea, being admitted during the year 2009.

The material basis of the study included the medical history of the patients, submitted at the archive of the hospitals, respectively the computer data of the two units.

The obtained data were interpreted statistically on the basis of the determination and calculation of a series of indices: the report of the OR quota (having an interval of confidence of 95%), the chi square test, the Fisher test (for the identification of the significance degree), the absolute and relative frequency.

The processing of the data was made with the help of the program Microsoft Office Excel 2003.

The representation of the results was made with the help of the graphics and tables.

Each of these patients had their blood analyses made, by determining the amylase blood level.

The determinations were made respecting the following conditions (Beger H, et al, 2000):

- the preparing of the patient - à jeun (before eating);
- collected specimen – venous blood;
- collecting recipient – vacutainer with sodium citrate 0.105 M (report sodium citrate – blood =1/9);
- collected quantity – as the vacuum allows; to prevent to partial coagulation of the sample was assured the correct mixture of the blood with the anticoagulant, by movements of inversion of the tube (5-6 mild inversions);
- causes of rejecting the sample – vacutainer that is not full (at least 90%); the hemolyzed or coagulated sample, the collected sample in another tube that with citrate (Laboratory Corporation of America, 2010) ;

- the necessary processing after the collecting – the sample was centrifuged 15 minutes at 2500g;

- the stability of the sample – the sample is stable 8 hours at the room temperature; (Laborator Synevo, 2010), the separate plasma is stable 3 weeks at -20ºC; >1 an at -70ºC. Before the analysis, the refrigerated samples were defrosted fast in 3-5 min at 37ºC. The defrosting at lower temperatures can produce cryoprecipitation. (Halang W, et al, 2002)

RESULTS

The bioclinical explorations were recorded at 90 patients (33,5%), 45 cases of each degree of severity, representing 30,2% of easy acute pancreatitis PAU and 37,5% of severe acute pancreatitis PAS.

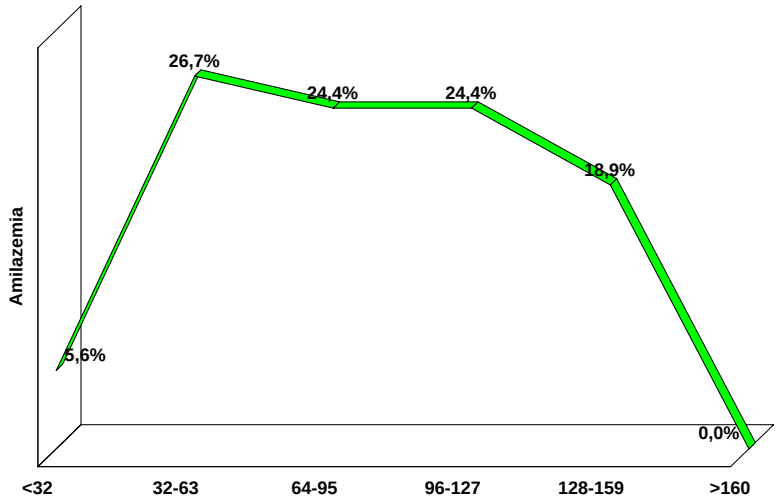
AMYLASE BLOOD LEVEL

Table 1.

Distribution of the case depending on the values of amylase blood level.

	PAU		**PAS**		**Total**	
	No.	**%**	**No.**	**%**	**No.**	**%**
<32	0	0,0	5	11,1	5	5,6
32-63	12	26,7	12	26,7	24	26,7
64-95	14	31,1	8	17,8	22	24,4
96-127	11	24,4	11	24,4	22	24,4
128-159	8	17,8	9	20,0	17	18,9
>160	0	0,0	0	0,0	0	0,0
Mp±DS	**89,4±10,9**		**85,0±11,2**		**87,2±11,1**	

Initially only 5,6% of the patients had normal values of the amylase blood level and over 75% of the patients had values between 32-127 (75,5%).



Graphic no.1. Distribution of the cases depending on the amylase blood level.

Normal values of the amylase blood level were not recorded for any patient with PAU but were recorded 5 patients with PAS (11,1%). For this reason the average value of the amylase blood level for the patients with PAS was not significantly smaller than for the patients with PAU (85,0 versus 89,4)($p>0,05$).

DISCUSSIONS

Even if the diagnosis of acute pancreatitis became easily to be made by measuring the specific pancreatic enzymes, the early evaluation of the prognostic remains a clinical challenge in a first stage of the disease.

Hyperamylasemia is present even from the debut of the affection, its values increasing early; even if it can be seen also in other affections (vives, salivary lithiasis), a value greater 3-5 times the limit of normal is strongly suggestive for the acute pancreatitis.

Their returning to normal can be fast in 24 hours and up to a few days in case of a favorable evolution or it can be maintained for longer periods of time if there are complications.

Other times, the amylases can have values only a bit increased or even normal in the conditions of a very severe condition of the patient, probably due to the structural and enzymatic exhaustion of the pancreas, this situation being rarer in case of biliary acute pancreatitis and more frequent in the case of those with alcoholic etiology.

The amylase, as enzymatic marker of the pancreatitis is generally more increased in biliary ones compared to those from other etiologies (toxic, ethanolic) for the same destructive parenchymatous injuries.

The results obtained and processed statistically indicate the fact that were not recorded for any patient with PAU normal values of the amylase blood level.

For the patients with PAS the normal value of the amylase blood level was recorded only for 11,1%.

The obtained data are comparable with similar studies performed on national and international level. P.A. Calvien et. al made a prospective study, determining the amylase blood level for 318 patients with acute pancreatitis. Following this study it resulted the fact that 67 of these cases (19%) had normal serum levels, the amylase at admittance (for example, smaller than 160 UI / L, which includes a limit of 99% of the control values), a number considerably greater than it is generally admitted. When is compared with acute pancreatitis with increased sero amylase, the normoamylasemic pancreatitis was characterized by the following: prevalence of alcoholic etiology (58% vs 33%, respectively, p less than 0,01) a greater number of previous attacks in alcoholic pancreatitis (0,7 vs 0.4, p smaller than 0,01) and (3) a longer period of the symptoms before the admittance (2,4 vs 1.5 days, less than 0.005 p).

CONCLUSIONS

The determining of the amylase blood level indicate values over the normal for 75% of the patients with acute pancreatitis; in case of the patients with PAU were not recorded normal value of the amylase blood level, and for 5 of the patients with PAS were recorder normal value of the amylase blood level.

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