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# Specific Relevance of Laboratory Examinations in Patients with Chronic Hepatic Disease-Our Experience

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**Abstract:** ***Introduction**: Main causes of chronic lesions and hepatic cirrhosis are alcohol and viruses. Indicators of fibrosis and other laboratory examinations find application in chronic hepatic lesions and in cirrhosis. Comparative selection of these indicators is irreplaceable in treatment, monitoring and prognosis **Aim**: Features of selected laboratory examinations as cholesterolemia(Chol), trigliceridemia(Tri), chanaliculi enzymes ALP (alkaline fosfataza), GGT (gamaglutamil transferase) in patients with chronic hepatic lesions including cirrhosis, and observation and usefulnes of index of fibrosis that takes into account ALT and platelets. **Material and Methods**: Fibrosis index is calculated in 30 normal patients, 16 patients with chronic etilizem, 26 with ethyl cirrhosis and 24 with viral cirrhosis. Also, among these groups, is compared kolesterolemia, trigliceridemia, alkaline phosphatase and gamaglutamiltransferase. **Results**: Fibrosis index: Control group:0.188±0.1 compared with ethyl cirrhosis 0.998±0.877( p<0.0001; Cirrhosis 2.11±2.6 compared with chronic ethylism 0.463±0.385(p=0.0014);Ethyl cirrhosis compared with chronic ethylism(p=0.034); viral cirrhosis 3.27±3.29 compared with ethyl cirrhosis 0.918±0.877( p<0.017); Chol:chronic ethilism=186±48.9; ethyl cirrhosis 117±41.7(p<0.0001); viral cirrhosis= 99.9±53.2;ethyl cirrhosis(p=0.24) Tri:chronic ethylism =80.3±32.9; Ethyl cirrhosis=92.9±55 (p=0.47),viral cirrhosis=78.9±35.2, ethyl cirrhosis(p=0.32). GGT chronic ethilism=119±122, ethyl cirrhosis=98.3±86.8(p=0.51); viral cirrhosis compared with ethyl cirrhosis(p=0.27);ALP viral cirrhosis=160±87.5 ethyl cirrhosis=124±46.4(p=0.089) chronic ethylism= 67.8±16.8, ethyl cirrhosis 124±46.4(p=0.0001). **Conclusion**: Index of fibrosis, chol but not Tri, ALP but not GGT, depend on the stage of the lesion histopathology of liver. Index of fibrosis, give us additional information to medical decision making in chronic hepatic lesions, including cirrhosis.*

**Keywords**: lesion, hepatic enzymes, Index of fibrosis, lipids variation

## 1. Introduction

Liver plays an essential role in vital processes, metabolism and defence and adaptive mechanisms of human body. The role of the liver is indispensable on carbohydrate, lipids, protein, vitamin metabolism. Xenobiotics undergo hepatic metabolism,too. Transformation( conjugation etc.) acceleration of hepatic elimination, adaption of hepatic clearance, action of cytochrome P450 family, are tools of hepatic detoxification processes. Liver has a key role and on digestion and elimination processes of human body. Almost all proteins except imunoglobulins, synthetized in the liver.(2)

Assessment of hepatic enzymes as indicators of hepatocyte necrosis, ALT, AST, GGT and bilirubin are decisive in acute hepatic lesions. Whether hepatic enzymes coming from bile chanaliculi or derive from the cytolisis of hepatocites serves to differentiate the main causes of hepatic pathologies. In acute hepatitis ALT and AST values, have high diagnostic specificity ( 95%). On the other hand monitoring of these enzymes are useful for prognostic evaluation. (2,11)Cell involvement in the way of fibrosis, conditioned by cell interactions, paracrin environment where Stellate cells and activation of TGF-β(transforming growth factor), plays a decisive role in chronic hepatic lesions, installation and progression toward hepatocellular failure (3,12).

Diagnostic and prognostic relevance of citolysis enzymes, during chronic hepatic lesions, falls in contrast with acute hepatitis lesions(where we can see an up to 100-fold increase of ALT and AST), or riacutisation of chronic lesions. During chronic lesions ALT and AST may result normal , moderate and generally increase of hepatic enzymes does not exceed two time-fold increases.

During chronic lesions diagnostic and prognostic problems are more complex and medical decision or patient level of cooperation is more difficult. Medical solutions are more difficult and expensive, including the fact that these pathologies are often with no clinical signs or clinical signs are general and vague.(2,3,10). From this point of view, the focus on the laboratory examinations is of particular importance, especially for minimizing the biopsies.

Evaluation of the status of hepatic cells and the level of fibrosis, needs integral evaluation(indexes of fibrosis) or simultaneus determination of citolysis and chanaliculi hepatic enzymes, hemogram parameters, especially platelets, as well as lipid parameters, protrombine time or albumin level. (9.6)

On the other hand lipid metabolism, as was said, depends on biosynthetic capacity of hepatic cells. So we'll see how cholesterolemia and trigliceridemia varies in patients with chronic hepatic lesions, including cirrotic patients.( 2 )

In a situation of decreasing of biosynthetic capacity of hepatic cells as occurs in chronic hepatic lesions, including cirrhosis, lipid profile parameters is expected to decrease their plasma concentrations, compared with a normal

population(our control group and normal references values). (1,2,3)

The question arises are: Is there any decreasing of Chol plasma level concentration during chronic hepatic lesions below reference range values? Is there any decreasing of Tri plasma level concentration during chronic hepatic lesions below reference range values? Is there any statistically significant difference in cholesterol and triglyceride plasma level concentrations between patients with hepatic cirrhosis and chronic hepatic lesions? Influences or not the cause of hepatic diseases on the plasma level concentration of Chol or Tri? What can be said about ALP and GGT?

Referring to what was said above, we have calculated index of fibrosis that takes into account ALT and platelets and have seen the values of Chol and Tri, ALP and GGT, in patients with chronic hepatic lesions including cirrhosis and to emphasize relevance and usefulness of these indicators.

## 2. Material and Methods

We selected 30 young people as control group. We measured ALT, PLT, calculated index of fibrosis, and measured chol, tri, GGT and ALP at our control group. Also, we so these parameters, to these patients subgroups: 16 patients with chronic ethilism, 26 with ethyl cirrhosis and 24 with viral cirrhosis. Hepatic enzymes were determined by the kinetic method with factor. Chol and Tri were measured by end point method. PLT were measured by electric impedance method in MINDRAY Cell Counter.

## 3. Results

**Table 1:** Fibrosis Index, Chol, Tri to the patients with chronc hepatic lesions.

| Chronic hepatic lesion | Index of Fibrosis ALT dhe PLT | Cholesterolemia variations (N=150-200mg/dl) | Trigliceridemia values (N=40-150 mg/dl) |
|---|---|---|---|
| Chronic Ethilism | 0.463±0.385 | 186±48.9 | 80.3±32.9 |
| Ethyl Cirrhosis | 0.998±0.877 | 117±41.7 | 92.9±55.1 |
| Viral Cirrhosis | 3.27±3.29 | 99.9±53.2 | 78.9±35.2 |
| Control group | 0.188±0.1 | 147±31.8 | 94±25.2 |
| Cirrhosis | 2.11±2.6 | 108±47.5 | 85.9±45.1 |

**Table 2:** Statistically significant differences of our selected index of fibrosis

| *Chronic hepatic lesion* | *Statistically significant differences of index of fibrosis* |
|---|---|
| Control group vs ethyl cirrhosis | P<0.0001 |
| Ethyl cirrhosis vs chronic ethilism | P<0.0034 |
| Cirrhosis vs chronic ethilism | P<0.0014 |
| *Viral cirrhosis vs ethyl cirrhosis* | *P<0.017* |

Index of fibrosis depends on histopathological stage of chronic hepatic lesions and help us for medical decisions.( biopsy, treatment, prognosis).Interesting is statistically significant difference of index of fibrosis between viral cirrhosis group and ethyl cirrhosis as prognostic relevance.

**Table 3:** Statistically differences of Chol and Tri in our patients group

| Chronic hepatic lesions | Statistically differences of Chol | Statistically differences of Tri |
|---|---|---|
| Ethyl hepatic lesions and ethyl cirrhosis | P=0.0001 | P=0.47 |
| Viral cirrhosis and ethyl cirrhosis | P=0.24 | P=0.32 |

**Table 4:** ALP variations to the patients with hepatic cirrhosis

| Hepatic Cirrhosis | ALP variation (N=3-120) | Statistical processing |
|---|---|---|
| Viral Cirrhosis | 160±87.5 | P=0.089 |
| Ethyl Cirrhosis | 124±46.4 | P=0.089 |

There is no significance statistical difference of ALP between these two groups.

**Table 5:** ALP variations between patients with chronic hepatic lesions and patients with hepatic cirrhosis.

| Chronic hepatic lesions | ALP variations (N=3-120 U/l) | Statistical processing |
|---|---|---|
| Chronic alcoholism | 67.8±16.8 | P=0.0001 |
| Hepatic cirrhosis | 124±46.4 | P=0.0001 |

There is significance statistical difference of ALP between these two groups(p=0.0001)

**Table 6:** GGT variations between patients with viral and ethyl cirrhosis.

| Chronic hepatic lesions | GGT variations (GGT) (N=0-55U/l) | Statistical processing |
|---|---|---|
| Viral cirrhosis | 119±122 | P=0.27 |
| alcoholic cirrhosis | 85.6±72.9 | P=0.27 |

There is no singnificant statistical difference of GGT between these two groups. (p=0.27)

**Table 6:** GGT variations between patients with chronic alcoholism and hepatic cirrhosis

| Chronic hepatic lesions | GGT varations (GGT) | Statistical processing |
|---|---|---|
| Chronic alcoholism | 119±122 | P=0.51 |
| Alcoholic cirrhosis | 98.3±86.8 | P=0.51 |

There is no statistical significance difference between these two groups.

## 4. Discussion

Referring to our results it is worth to pay a little more attention to enzymes GGT and ALP as chanaliculi enzymes. If we observe an isolated, slight or moderatley increase of alkaline phosphatase ,what are the details of the literature related to this fact?

Slight or moderate( <1.5 of upper limit of reference ranga) increased of ALP without simultaneous increase GGT, exclude a hepatic chanaliculi pathology, and should be monitored. Sligtly or moderate increased ALP often goes towards normalization, but requires the exclusion of autoimmune pathology as primary biliary cirrhosis and exclusion of other intestinal pathologies such as ulcerative colitis which may give an increasing of alkaline phosphatase as a result of the growth of intestinal alkaline phosphatase (2,5)).

A slight or moderate increase of alkaline phosphatase, noticed especially in women over 50 years old, and causes of isolated slight or moderate increase of alkaline phosphatase are not completely cleared. (5). Simultaneous growth of both liver enzymes ALP and GGT, suggests a pathology of bile chanaliculi explained with their hepatic localization. ALP is located in the membrane that is in the sinusoidal border of bile chanaliculi and parenchymal cells This enzyme is located to osteblasts, and intestinal cells, too. GGT is an microsomale enzyme and is located to the renal proximal tubular cells, intenstinal and pancreatic cells. (1,2,3,11)

According to the literature, ALP monitoring suggests presence or not of primary biliary cirrhosis and the presence or not of hepatitis C, and serves as an indication for biopsy. (4)

## 5. Conclusions

1. In our four groups, statistically differences , referred index of fibroses are noticed as follows: Control group 0.188±0.1 compared with ethylic cirrhosis 0.998±0.877( p<0.0001); Cirrhosis 2.11± 2.6 compared with chronic ethilism 0.463±0.385(p<0.0014); ethyl cirrhosis compared with chronic ethilism(p=0.034); Viral cirrhosis 3.27±3.29 compared with ethyl cirrhosis0.998±0.877(p=0.017). Index of fibrosis depends on histopatological stage of the liver. This index oriented us for medical decision. As we can see this index has prognostic relevance, too.
2. In our groups statistically differences of GGT and ALP are noticed as follows:
   a. Ethyl cirrhosis compared with chronic ethilism(GGT:p=0.27, ALP:p=0.0001)
   b. Ethyl cirrhosis compared with viral cirrhosis(p=0.51; ALP:p=0.089)

Statistically significant diference of ALP but not GGT, in group 2 a) patients and isolated increase of ALP during cirrhosis as we discussed are in accordance with literature data.

3. In our groups statistically differences of Chol and Tri are noticed as follows:
   Chronic ethilism compared with ethyl cirrhosis(Chol: p=0.0001; Tri: p=0.47)
   Viral cirrhosis vs ethyl cirrhosis( Chol:p=0.47 Tri:p=0.32)
   Staristically significant difference of cholesterolemia, but not trigliceridemia in groups 3 a) patients is in accordance with literature data by which reducing of biosynthetic capacity of the liver is the reason of dislipidemia and depends on histopathological stage.
4. Definitively index of fibrosis we selected, ALP but not GGT, chol, but not Tri, can serve as indicators of histopathological stage. Evaluation of these three indicators serves for medical decision and has prognostic importance, especially index of fibrosis and ALP.

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