

## CHANGES OF THE SERUM ENZYME LEVEL IN PATIENTS WITH LIVER CARCINOMA

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Recently, the enzyme diagnostics of liver diseases develops very intensively in the view of optimal use of enzyme sets and constellations for the needs of clinical practice. (3, 6—10). Concerning the acute and chronic liver diseases there are relatively a few enzymes only which have a greater diagnostic importance. Out of the cytoplasmic enzymes both SGOT and SGPT are most significant, out of cellular membrane ones the following enzymes have to be pointed: GGTP, AP, LAP and 5'-nucleotidase. As regards the ergastoplasmic reticulum enzymes both cholinesterase and CPI are considered to be most significant.

Nowadays, the incidence of metastatic and primary liver carcinoma increases. As regards many European countries the patients with primary liver carcinoma are at an average about 2,5 % out of all cancer patients but in Bulgaria this percentage is 8,5 %. Concerning Varna city and, especially Bourgas district this ratio is considerably higher (up to 19 %). In some African countries over 80 % of malignant diseases are due to primary liver carcinoma (4, 5, 11, 16). Of course, the laparoscopy and the purposeful liver biopsy are most important for diagnosis of hepatic carcinoma (2, 5, 11, 16), but they can't be performed in every one patient. That's why besides clinical examination the laboratory tests, especially of GGTP, SGOT, SGPT, AP, LAP and cholinesterase, play an essential role in these cases.

The so-called Weber's triad is described in patients with liver carcinoma. It consists of: 1. Increase of excretory cholestatic enzymes. GGTP increases commonly more than 20 times which is due to the cholestasis and to the intensive synthesis in surrounding parenchyma and even in neoplastic tissue (6, 8, 12, 14, 15) AP is usually increased more than 10 times (6, 8, 13). LAP activity is more frequently positive than AP one and more rarely than GGTP one. (6, 8).

The increase of GGTP, AP and LAP is less expressed in cases of benign extrahepatic cholestasis (6, 8). 2. A cytolysis and a necrosis with moderately increased SGOT and SGPT levels can be found out in most patients with liver carcinoma (1, 8, 14, 17). 3. The reduced hepatic function is manifested with strongly diminished cholinesterase. Its level decreases later and less expressed in the cases with metastatic than in those with primary liver carcinoma (6, 8, 10, 14, 17).

The aim of our work was to investigate the changes of serum enzymes in patients with liver carcinoma.

### Material and methods

The serum enzymes were studied by using standard methods in the Central biochemical laboratory, District hospital, Varna city. Enzyme levels are given according to SI bioconstants. The investigation covers 48 patients with liver

carcinoma (primary and secondary). They were 25 males and 23 females aged between 23 and 75 years, at an average 57,5 years. 16 patients with choledocholithiasis and extrahepatic cholestasis were also examined. They were 6 males and 10 females aged 26—74 years, at an average 55,2 years. As controls, 26 healthy individuals (12 males and 14 females aged between 18 and 72 years, at an average 37,5 years) were also studied. Any patients were either laparoscopically and, or laparotomically verified and then histologically examined. The variation analysis was used in statistical data processing.

### Results and discussion

Table 1 demonstrates that levels of any serum enzymes (GGTP, SGOT, SGPT, AP, and LAP) are reliably increased in patients with liver carcinoma as

Table 1

Patients' groups/ Enzymes	Healthy		Liver carcinoma		P	% increased enzyme levels
	n	$\bar{x} \pm m$	n	$\bar{x} \pm m$		
GGTP	25	17,64 $\pm$ 3,06	41	420,2 $\pm$ 44,06	<0,001	92,68
SGOT	25	10,08 $\pm$ 1,46	48	39,6 $\pm$ 3,17	<0,001	81,25
SGPT	25	11,48 $\pm$ 1,58	48	40,73 $\pm$ 4,18	<0,001	66,67
AP	23	32,96 $\pm$ 2,39	48	232,3 $\pm$ 20,06	<0,001	95,83
LAP	12	15,25 $\pm$ 1,09	11	49,3 $\pm$ 8,13	<0,001	90,91
Cholin- esterase	15	4,59 $\pm$ 0,30	36	2,63 $\pm$ 0,26	<0,01	77,78

compared with those of the controls. GGTP increase is most expressed — more than 20 times, followed by AP one (more than 7 times), LAP one (more than 3 times) and both SGOT and SGPT ones (about 4 times). However, cholinesterase is reduced by approximately 40 %. Most frequently, GGTP, AP and LAP are changed. Our results coincide with those of many other authors (1, 6, 8, 12—15, 17). The comparison of serum enzyme levels in liver carcinoma patients with those of cases with extrahepatic choledocholithiatic cholestasis (see table 2)

Table 2

Patients' groups/ Enzymes	Liver carcinoma with cholestasis		Extrahepatic benign cholestasis		P
	n	$\bar{x} \pm m$	n	$\bar{x} \pm m$	
GGTP	22	501,5 $\pm$ 65,6	14	489,5 $\pm$ 82,13	>0,10
SGOT	25	48,4 $\pm$ 4,48	15	48,9 $\pm$ 7,50	>0,10
SGPT	25	48,4 $\pm$ 6,37	16	74,7 $\pm$ 11,31	<0,05
AP	25	291,2 $\pm$ 28,9	15	202,5 $\pm$ 25,84	<0,01
LAP	4	57,2 $\pm$ 15,6	5	79,2 $\pm$ 25,80	>0,10
Cholin- esterase	18	2,09 $\pm$ 0,32	10	2,25 $\pm$ 0,31	>0,10

shows that there are reliable differences only of AP levels which are higher in liver carcinoma patients while SGPT levels are lower. Some other investigators report similar data (6, 8). The juxtaposition of serum enzyme levels in hepatic carcinoma patients with or without hyperbilirubinaemia (see table 3) demonstrates a statistically

Table 3

Patients' groups/ Enzymes	Liver carcinoma with increased bilirubin		Liver carcinoma with normal bilirubin		p
	n	$\bar{x} \pm m$	n	$\bar{x} \pm m$	
GGTP	22	501,5 $\pm$ 65,6	19	321,5 $\pm$ 47,70	<0,05
SGOT	25	48,4 $\pm$ 4,48	23	30,0 $\pm$ 3,71	<0,01
SGPT	25	48,7 $\pm$ 6,37	23	31,7 $\pm$ 4,96	<0,05
AP	25	291,2 $\pm$ 28,9	23	168,3 $\pm$ 20,71	<0,01
LAP	4	57,2 $\pm$ 15,6	7	41,3 $\pm$ 10,34	>0,10
Cholinesterase	18	2,09 $\pm$ 0,32	18	3,1 $\pm$ 0,30	>0,10

reliably higher activity of GGTP, SGOT, SGPT and AP in patients with hyperbilirubinaemia while the changes of LAP and cholinesterase levels are statistically insignificant. The more considerable changes of serum enzyme activity in liver carcinoma patients with hyperbilirubinaemia are most probably due as well to the malignant process in hepatocytes, as to the cholestasis itself. Bearing in mind that hepatocytic GGTP activity is already increased at early carcinogenesis stages, we accept that its isolated increase even before the appearance of hyperbilirubinaemia has, undoubtedly, a great diagnostic significance.

On the basis of our study the following conclusions could be drawn:

1. The excretory cholestatic enzymes (GGTP, AP and LAP) have the greatest diagnostic value in liver carcinoma patients. They are increased in more than 90 % of the cases while the changes of the activity of cholinesterase and transaminases are more insignificant.

2. There is no essential difference between the activity of serum enzymes in liver carcinoma patients and that in choledocholithiatic cholestasis ones. That's why they can't be used as reliable test for differential diagnosis of malignant and benign cholestasis.

3. SGOT and SGPT activity is higher in advanced hepatic carcinoma patients with manifested jaundice as compared with those without icterus.

## REFERENCES

1. Бондарь, З. А. Клиническая гепатология. М., Медицина, 1970, 407 с. —
2. Браилски, Х. *Съвр. мед.*, 1974, 7, 47—50. — 3. Браилски, Х. В: Болести на черния дроб и жлъчните пътища. С., 1971, 623—647. — 4. Браилски, Х. В: Проблеми на хепатологията. С., 1974, 39—65. — 5. Браилски, Х. В: Съвременни проблеми в гастроентерологията. С., 1979, 197—214. — 6. Данев, С. Ензимна диагностика. С., Медицина и физкултура, 1974, с. 247. — 7. Данев, С., Е. Цветанова. В: Нац. конгр. клин. лабор., II. С., 1975, — 8. Данев, С., Д. Дочев. В: Съвременни постижения в гастроентерологията. С., 1977, 196—212. — 9. Малеев, А., С. Стоянов. Хронични хепатити. С., Медицина и физкултура, 1974, с. 113. — 10. Ташев, Т. Вродени и придобити ензимопатии. С., Медицина и физкултура, 1976, 9—45, 277—310. — 11. Hennig, H., D. Looк H. H. Braun. *Z. Gastroenterol.*, 10,

- 1972, 433—436. — 12. Kokot, F., Z. Sledzinski. *Z. Klin. Chem. Klin. Biochem.* 12, 1974, 374—384. — 13. McKenzie, D., A. Henderson. *Clin. Chim. Acta*, 62, 1975, 447—450. — 14. Rolsalski, S. *Adv. Clin. Chem.*, 17, 1975, 53—107. — 15. Schmidt, E., F. Schmidt. In: *Gallenwegeleber*. Stuttgart, G. Thieme, 1973, 32—50. — 16. Sievers, B. U. *Acta Hepato-Gastroenterol.*, 20, 1973, 6, 489—497. — 17. Wallnöfer, H., E. Schmidt, F. Schmidt. *Synopsis der Leberkrankheiten*. Stuttgart, G. Thieme, 1974.

## ИЗМЕНЕНИЯ УРОВНЯ СЫВОРОТОЧНЫХ ЭНЗИМОВ У БОЛЬНЫХ РАКОМ ПЕЧЕНИ

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### Р Е З Ю М Е

Авторами исследованы ферменты 48 больных раком печени, 16 больных доброкачественным холелитиазом с экстрагепатальным холестаазом и 25 здоровых лиц. Наибольшей диагностической ценностью отличаются изменения активности ГГТФ, АФ и ЛАФ, повышенных более чем у 90 % больных раком печени. Меньшую диагностическую ценность имеют сывороточная холестерин-аза, а также СГОТ и СГПТ.