Journal of Advanced Zoology

ISSN: 0253-7214

Volume ***44*** *Issue* ***Special Issue-2 Year 2023*** *Page* ***3744:3750***

CLINICAL AND LABORATORY FEATURES OF SPONTANEOUS BACTERIAL PERITONITIS IN PATIENTS WITH VIRAL LIVER CIRRHOSIS

[1] **Oblokulov Abdurashid Rakhimovich**
[2] **Mukhammadieva Musharraf Ibrokhimovna**
[3] **Sanokulova Sitora Avazovna**
[4] **Khadieva Dora Isakovna**

Bukhara, Uzbekistan, postal code 200100
Bukhara State Medical Institute named after Abu Ali ibn Sina, Uzbekistan,
Bukhara, A.Navoi str.1 Tel: +998(65) 223-00-50 e-mail: info@bsmi.uz

Article History
Received: 08July2023
Revised: 27 Sept 2023
Accepted: 29 Oct 2023

Abstract. The article presents clinical and laboratory data of the examined patients. 118 patients were under observation. Main group I included 60 patients suffering from liver cirrhosis of viral etiology with SBP, main group II included 58 patients with liver cirrhosis. As a control, 20 practically healthy people were also examined. In all patients with SBP (Group 1) at the stage of decompensation of liver cirrhosis of viral etiology, the level of PCT was significantly higher by 10 times, amounting to 0.88±0.04, compared with patients with uncomplicated SBP (Group 2), in which is equal to 0.08±0.02 (p=0.05). It was found that the level of CRP in the 1st group was 32.4±8.23 and increased by 3.75 times (p=0.05) compared with the 2nd group. Based on these values, it can be concluded that the level of PCT and CRP in the blood serum has been proposed as a marker for early non-invasive diagnosis in patients with cirrhosis and SBP.

Key words: *liver cirrhosis, spontaneous bacterial peritonitis, procalcitonin, C-reactive protein.*

Relevance

The World Health Organization (WHO) estimates that more than 325 million people worldwide are infected with viral hepatitis B or C and 1.4 million people die each year. In terms of mortality, hepatitis B and C together are second only to tuberculosis, and the number of people infected with hepatitis is 9 times higher than the number of people infected with HIV. Yet over 80% of people with hepatitis do not have access to prevention, testing and treatment [1,2]

Despite the successes achieved in the fight against many infectious diseases, in modern medicine the problem of chronic viral hepatitis (CVH) in Uzbekistan, as well as throughout the world, continues to be relevant [3,4]. The significance of this problem is determined not only by the ubiquitous and significant distribution, but also by the predominant lesion of people of working age, a long and progressive course, the complexity of therapy and patient management, severe consequences, such as cirrhosis of the liver (LC) and hepatocellular carcinoma (HCC), as well as significant costs of medical and social support for this category of patients [5, 6]

Spontaneous bacterial peritonitis is a common and severe complication. About 32-40% of hospitalized patients with cirrhosis develop bacterial infections at presentation or during hospitalization. The problems of their diagnostics are waiting for their solution, which have not been solved so far [7,8].

1.A bacterial infection is either present on admission or develops during hospitalization in approximately 30% of patients with cirrhosis [9], and the most common form of these infections is spontaneous bacterial peritonitis (SBP) [10,11].

Patients with cirrhosis have altered protection against bacteria associated with a decrease in bacterial clearance [12]. This immune defect promotes bacterial translocation caused by increased intestinal permeability and bacterial overgrowth [13]. Diagnosis of bacterial complications of cirrhosis is often difficult due to the erased clinical picture of the disease. Sometimes infectious complications appear only as an aggravation of hepatic encephalopathy. Simple and affordable screening tests for bacterial infection in liver cirrhosis include C-reactive protein (CRP) and procalcitonin [14].

Procalcitonin has been proposed in studies as a potentially valuable serum biomarker for diagnosing bacterial infections in general and SBP in particular [15].

CRP is a prominent biochemical marker of inflammation caused by a variety of causes, including infectious and non-infectious inflammatory diseases, and has also been shown to be involved in several immunological functions [16,17]

Thus, infections are common in patients with cirrhosis of the liver, and SBP is one of the most common, with variable frequency but significant mortality. One of the most important factors in the management of this significant consequence of decompensated liver cirrhosis is early detection. It is critical to find non-invasive, accessible, and easy-to-apply SBP-related parameters that play a predictive role. However, it should be borne in mind that these methods cannot completely replace paracentesis; More research is needed to determine if non-invasive methods are accurate enough to detect the development of SBP in cirrhosis.

Materials and methods

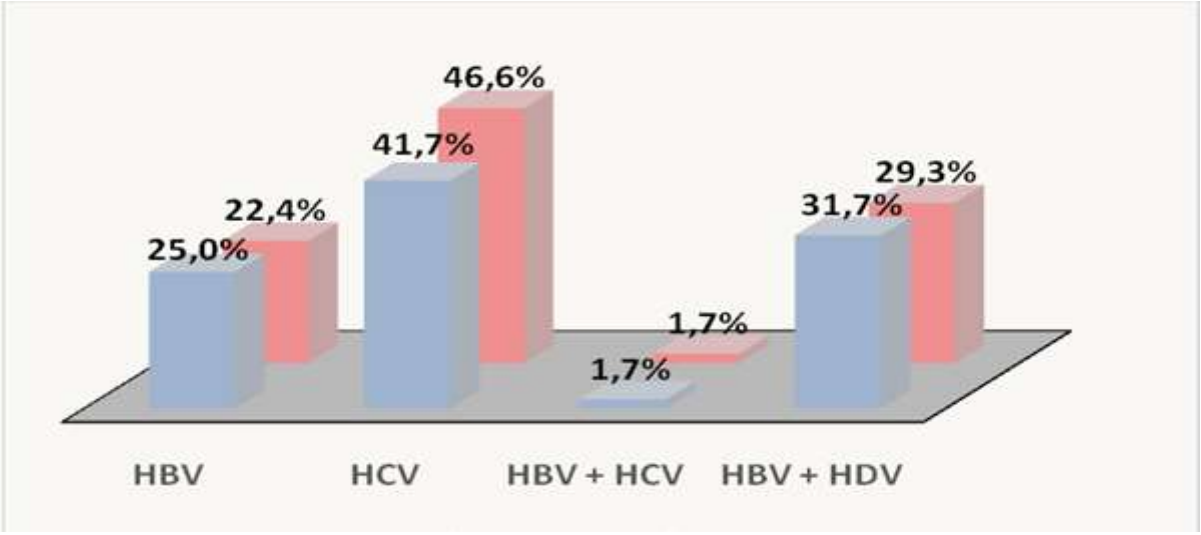
Clinical observations, laboratory and instrumental examinations of patients with liver cirrhosis of viral etiology were carried out in the Bukhara Regional Infectious Diseases Hospital, at the Research Institute of Virology of the Republican Specialized Scientific and Practical Medical Center for Epidemiology, Microbiology, Infectious and Parasitic Diseases.

Main group I included 60 patients suffering from liver cirrhosis of viral etiology with SBP, main group II included 58 patients with liver cirrhosis. As a control, 20 practically healthy people were also examined.

The diagnosis of cirrhosis with viral etiology was established on the basis of the epidemiological anamnesis, medical history, clinical data and on the basis of laboratory data.

In order to establish the viral etiology of the diagnosis of cirrhosis, an analysis was made to determine the markers of infection with the HBV, HDV viruses, HCV was determined by the polymerase chain reaction (PCR).

Among them, in the 1st group, HBV- infection was observed in 15 (25%) patients, HCV infection - in 25 (41.7%), HBV + HCV- infection - in 1 (1.67%), HBV + HDV- infection - in 19 (31.7%). In the second group, HBV infection was noted in 13 (22.4%) patients, HCV infection in 27 (46.6%) patients, HBV+HCV– infection in 1 (1.72%), HBV+HDV– infection in in 17 (29.3%) (Fig. 1).



1-group **2-group**

PICTURE 1. Distribution of patients by nosological forms

The purpose of the study: to study the clinical and laboratory features of spontaneous bacterial peritonitis in patients with liver cirrhosis of viral etiology.

Result and discussion

The results of the study showed that in the first group of 60 patients, 38 (63.3%) were male and 22 (36.7%) female, and in the second of 58 patients, 27 (46.55%) were male and 31 (53.4%) consisted of women. It should be noted that the probability of occurrence of SBP prevailed in men.

The average age index of sick men of the 1st group was 48.4±10.1 years, and in women 43.1±14.8 years. The age indicators of patients of the 2nd group did not differ from the first and amounted to 45.5±10.1 and 52.1±13.07, respectively.

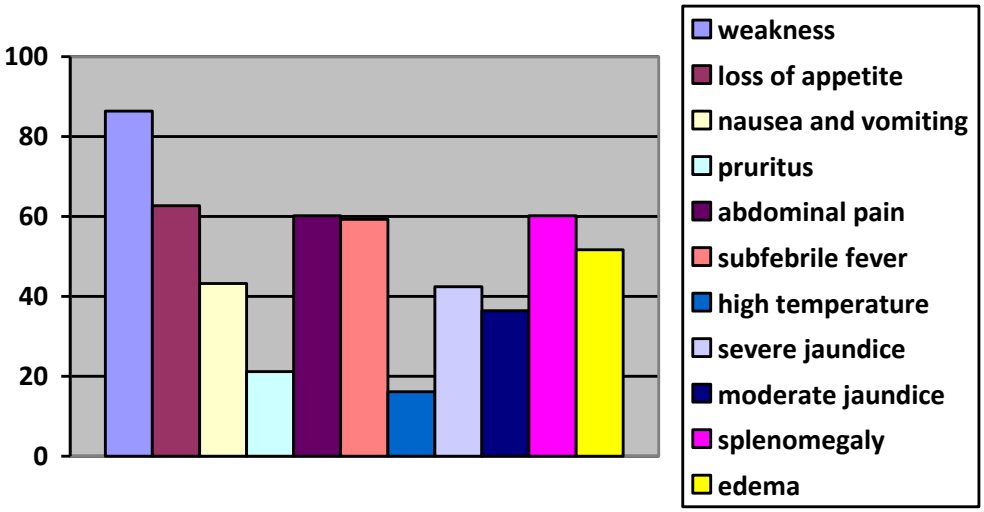
The duration of the disease in patients of both groups ranged from one month to several years, while the majority of them, 46.7% and 41.4%, respectively, indicated that liver cirrhosis was diagnosed several years ago.

An analysis of the incidence of the disease between groups showed that in group 1, cirrhosis was most often detected in 17 (28%) people aged 51-60 years, the bulk of which were 12 (20%) men and 5 (8.3%) women. Unlike the first group, in the 2nd group cirrhosis of the liver was detected in the age group of 41-50 years, mainly in 10 (17%) men and 6 (10%) women.

These data correspond to the results of foreign epidemiological studies, in particular, the results of V.T. Ivashkin, which included more than 50,000 patients from different regions of the Russian Federation (2014) [18].

The main clinical signs of the examined patients were general weakness in 102 (86.4%), decreased appetite in 74 (62.7%), nausea and vomiting in 51 (43.2%), pruritus in 25 (21.2%) and abdominal pain 71 (60.2%), 70 (59.3%) had subfebrile fever, 19 (16.1%) had a high temperature, 50 (42.4%) had severe jaundice, 43 (36.4%) - moderate jaundice, 71 (60.2%) - splenomegaly, 61 (51.7%) were found to have edema (Picture 2). These data are consistent with the results of foreign clinical trials [19,20].

When examining patients, "spider veins" were noted in 75 (63.6%), palmar erythema in 43 (36.4%), varicose veins of the esophagus in 68 (57.6%). Cases of epistaxis were observed in 47 (39.8%) patients.



2-PICTURE. Clinic symptoms of SBP.

In addition, a comparative analysis was made of the duration of complaints and symptoms in patients in the comparison groups, which revealed significant differences between them. The results of a comparative analysis showed that patients of the 2nd group had more poor symptoms, in contrast to patients with SBP (1st group). The leading symptoms in patients of this group were itching (52±15.6%) and splenomegaly according to liver ultrasound, mostly asymptomatic (Table 1).

The majority of patients in the second group had asthenovegetative syndrome, which was characterized by the presence of general weakness and decreased performance (84.1 ± 9.03% of the total number of the group), while in patients of the first group, these signs occurred with a frequency 89.4±8.3%. In 72.3±15.4% of patients of the second group, dyspeptic symptoms were noted, in particular, episodic occurrence of heartburn, heaviness in the epigastric region, decreased appetite and loosening of the stool. Pain in the abdomen in patients of the 2nd group was 65±14%, and in patients of the 1st group, this figure was 76±13%.

TABLE 1.

Average duration of subjective complaints of patients in comparison groups (M±m)

Groups	Malaise	Abdominal pain	Nausea, vomiting	Loss of appetite	Skin itching
1st group (n=60)	8,4±2,7	7,2±2,7	6,5±2,4	7,19±2,76	5,48±3,23
2nd group (n=58)	8,3±1,9	6,5±2	7,2±2,2	7,12±1,96	5,12±2,09

An objective examination was organized to identify signs such as jaundice of the skin and sclera of the eyes, white coating on the surface of the tongue, the presence of “caput medusae” and liver symptoms such as palmar erythema, spider veins, bleeding from the gums and nose.

In case of liver diseases, the skin acquires a yellow color of varying intensity: from dark gray to dark yellow, which in turn occurs as a result of the deposition of bilirubin and its metabolic products in the skin. Jaundice often affects the eyes and mucous membranes: instead of white, they turn yellow.

An objective examination of the patients revealed that in the 1st group during the treatment period, icterus of the skin and sclera of the eyes lasted 8.35±2.17 and 9.92±3.16 days, respectively, while the duration of these complaints in patients was 2- th group was 6.33±2.69 and 6.11±2.28, respectively, which was significantly less than the first group.

Palmar erythema or "hepatic" palms is a condition in which there is even redness of both palms. Palmar erythema appears due to circulatory disorders in the portal vein, leading to the formation of arteriovenous anastomoses. Reddening of the palms occurs when additional vascular branches are formed that connect the veins and arteries for the normal nutrition of the skin and other organs.

Signs of palmar erythema in patients of the 1st group lasted on average 1 day longer compared to the 2nd group, amounting to 9.63±2.68 and 8.93±1.98 days, respectively. The difference in spider vein symptom scores had similar results, with the duration being 9.28±0.68 and 8.13±2.16 days. Also, the appearance of spider veins in patients with cirrhosis may be associated with a violation of the estrogen conformational properties of the cytochrome system in the damaged liver.

Patients in whom cirrhosis proceeded with the development of complications in the form of the development of SBP (Group 1), in contrast to patients in whom cirrhosis of the liver proceeded without the development of complications in the form of SBP (Group 2), hypoalbuminemia was observed, the concentration of total protein in the blood in of the first group of patients was in the range of 27.2±2.3, while in patients of the second group this indicator was 31.2±4.7. This indicated a decrease in the protein-forming function in patients of both groups.

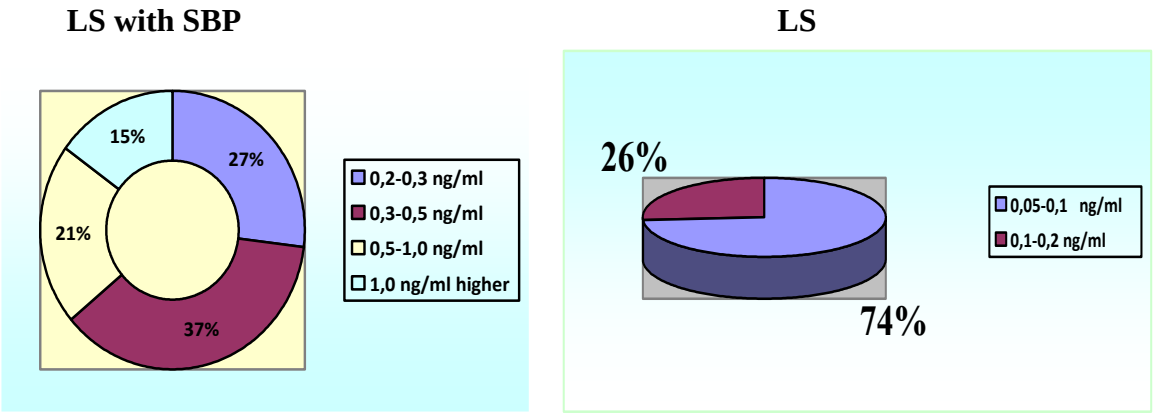
In addition, the mean values of the amount of fibrinogen in patients with SBP (Group 1) 0.73±0.14 were significantly lower by 3.83 times than in the group of patients without SBP (Group 2) 2.8±0.8 ($p<0.05$). It should be noted that the level of fibrinogen in the 2nd group fluctuated within the minimum values. Hypofibrinogenemia develops due to a decrease in the synthesis of fibrinogen, its increased consumption, as well as increased destruction during the activation of the fibrinolysis process.

Diagnosis of bacterial complications of cirrhosis is often difficult due to the blurred clinical picture of the disease. Sometimes infectious complications appear only as an aggravation of hepatic encephalopathy. Simple and affordable screening tests for bacterial infection in cirrhosis include C-reactive protein and procalcitonin.

In all patients with SBP (Group 1) at the stage of decompensation of liver cirrhosis of viral etiology, the level of PCT was significantly higher by 10 times, amounting to 0.88±0.04, compared with patients with uncomplicated SBP (Group 2), in which is equal to 0.08±0.02 ($p=0.05$).

When analyzing the increase in the level of PCT in the blood serum in patients of the first group, the content of PCT was observed in the range of 0.2-0.3 ng/ml in 26.7% (16 people), in the range of 0.2-0.3 ng/ml in 36.8% (21 people) 0.3-0.5 ng/ml, 21.7% (13 people) 0.5-1.0 ng/ml, and 14.8% (10 people) 1.0 ng/ml ml, in patients of the control group it was registered in 74.2% (43 people) 0.05-0.1 ng/ml, in 25.8% (15 people) it was 0.1-0.2 ng/ml (Fig. 2). In 2013 Su DH et al. performed a meta-analysis of PCT including 181 episodes with suspected infection, resulting in pooled sensitivity, specificity, positive likelihood ratios, and negative likelihood ratios of 86%, 80%, 7.73, and 0.14, respectively, suggesting PCT as a diagnostic aid for SPB with moderate to high accuracy [21]. In another 2015 study, Yang Y.'s meta-analysis included 742 patients across 17 studies and found that PCT at a cutoff of 0.42–0.76 ng/mL has a sensitivity of 82% and a specificity of 86% for predicting SBP [22].

According to the results of the analysis, an increase in the PCT inflammatory marker of 0.2 ng/ml in patients complicated by SBP indicates the addition of a bacterial infection and is an indication for prescribing antibacterial drugs.



PICTURE 3. Average values of PCT level in comparison groups (%)

As can be seen from the data presented in Picture 3, there were statistically significant differences in the values of laboratory parameters characterizing the functional state of the liver between patients of groups I and II.

The final stage of biochemical analysis in the studied blood groups was the study of the amount of C-reactive protein. It was found that the level of CRP in the 1st group was 32.4±8.23 and increased by 3.75 times (p=0.05) compared with the 2nd group. An increase in the level of C-reactive protein in the blood indicated significant tissue damage, inflammation, infection, and the presence of a virus. According to several studies, the threshold level of CRP for the diagnosis of infection in patients with liver cirrhosis should be between 2.0 and 8.0 mg/dL [23, 24].

Conclusions. Based on these values, it can be concluded that the level of PCT and CRP in the blood serum has been proposed as a marker for early non-invasive diagnosis in patients with cirrhosis and SBP.

REFERENCES:

1. World Health Organization. Global hepatitis report. Geneva, Switzerland; 2017. (Electronic resource). URL: http://www.who.int/hepatitis/publications/global-hepatitis- eport2017/en/ (access date: 11.09.2019).

2. WHO fact sheet, July 2019. Social aspects of population health. 2019;65(4). (In Russian).

3.Камилов Ф.Х. и др. Частота встречаемости различных этиологических форм хронических вирусных гепатитов и циррозов печени. Инфекция, иммунитет и фармакология. 2010. (1-2):102-105.

4. Ахмедова М.Д., Ташпулатова Ш.А., Ихтиярова Г.А., Каримова М.Т. Хронические вирусные гепатиты В и D у беременных: распространенность, течение и исходы (обзор литературы). Журнал инфектологии. 2021;13(2):29-37.

5. Mukhammadieva M.I. (2022). Modern Clinical and Biochemical Characteristics of Liver Cirrhosis Patients of Viral Etiology with Spontaneous Bacterial Peritonitis //Texas Journal of Medical Science. – 2022.- P. 86-90.

6. Menner A.S., Kinkel H.T., Dixit S.M., et al. Prevalence and behavioural risk factors for hepatitis B in Upper Dolpo, Nepal. Journal of Public Health. 2019; 20 (3): 481-488.

7. Oblokulov A.A., Oblokulov A.R., Ergashov M.M. Clinical and laboratory criteria for spontaneous bacterial peritonitis in liver cirrhosis of viral etiology. Central Asian journal of medical and natural sciences Volume 03, Issue 03, may-jun 2022 172-177. ISSN: 2660-4159.

8. Su, D.H.; Zhuo, C.; Liao, K.; Cheng, W.B.; Cheng, H.; Zhao, X.F. Value of serum procalcitonin levels in predicting spontaneous bacterial peritonitis. Hepato-Gastroenterol. 2013, 60, 641–646.

9. Мухаммадиева М.И. (2023). Вирус этиологияли жигар циррози беморларида спонтан бактериал перитонит билан асоратланишнинг профилактикаси ва давосини такомиллаштириш//Oriental Renaissance: Innovative, educational, natural and social sciences. - 2023.-P.947-953.

10. Fernández, J., Navasa, M., Gómez, J. et al. Bacterial infections in cirrhosis: Epidemiological changes with invasive procedures and norfloxacin prophylaxis. Hepatology 2002, 35, 140–148.

11. Винницкая Е. В. и др. Спонтанный бактериальный перитонит при циррозе печени: вопросы оптимизации профилактики и лечения //Экспериментальная и клиническая гастроэнтерология. – 2012. – №. 6. – С. 27-34.
12. Mukhammadieva M.I. (2023). Improving the prevention and treatment of complications of spontaneous bacterial peritonitis in patients with liver cirrhosis of viral etiology//Galaxy international interdisciplinary research journal -2023.-Vol. 11, Issue 04, April - P.-388-393
13. Wiest, R.; Garcia-Tsao, G. Bacterial translocation (BT) in cirrhosis. Hepatology 2005, 41, 422–433.
14. Mukhammadieva M.I. (2023). Improvement of primary prevention and treatment of complications with spontaneous bacterial peritonitis in patients with liver cirrhosis of viral etiology. Тиббиётда янги кун.-2023-9 (59).P. 247 – 252
15. Oblokulov A. R., Mukhammadieva M. I. (2022). Clinical and biochemical characteristics of liver cirrhosis patients of viral etiology with spontaneous bacterial peritonitis. ACADEMICIA GLOBE: INDERSCIENSE RESEARCH, 210-216.
16. Lobo, S.M., Lobo, F.R.; Bota, D.P., et al. C-reactive protein levels correlate with mortality and organ failure in critically ill patients. Chest 2003, 123, 2043–2049.
17. Baidoshvili, A., Nijmeijer, R., Lagrand, W.K., et al. Localisation of C reactive protein in infarcted tissue sites of multiple organs during sepsis. J. Clin. Pathol. 2002, 55, 152–153.
18.Ивашкин В.Т., Ющук Н.Д., Маевская М.В. и др. Рекомендации по диагностике и лечению взрослых больных гепатитом В. М.; 2014.
19. Arroyo V., Jiménez W. Complications of cirrhosis. II. Renal and circulatory dysfunction. Lights and shadows in an important clinical problem // J. Hepatol. 2000. Vol. 32. Suppl. 1. P. 157–170.
20 Винницкая Е.В. Спонтанный бактериальный перитонит. М.: Медпрактика-М, 2011.
21. Su, D.H.; Zhuo, C.; Liao, K.; et al. Value of serum procalcitonin levels in predicting spontaneous bacterial peritonitis. Hepato-Gastroenterol. 2013, 60, 641–646.
22. Yang, Y.; Li, L.; Qu, C.; et al. Diagnostic accuracy of serum procalcitonin for spontaneous bacterial peritonitis due to end-stage liver disease: A meta-analysis. Medicine 2015.
23. Li, C.H., Yang, R.B., Pang, J.H., et al. Procalcitonin as a biomarker for bacterial infections in patients with liver cirrhosis in the emergency department. Acad. Emerg. Med. 2011, 18, 121–126.
24. Lin, Z.Y., Chuang, W.L., Dai, C.Y., et al. Clinical application of serum C-reactive protein measurement in the detection of bacterial infection in patients with liver cirrhosis. Kaohsiung J. Med. Sci. 2002, 18, 121–126