ISSN 0976 – 3333

Available Online at www.ijpba.info

International Journal of Pharmaceutical & Biological Archives 2012; 3(5):1054-1057

ORIGINAL RESEARCH ARTICLE

Prevalence of Jaundice Based on Liver Function Test in Patients Attending OPD of Chitwan Medical College Teaching Hospital

Sanjay Yadav[1], Harish Chandra Neupane[2], Mamata Sharma Neopane[3], AK Sinha[4], Birendra Yadav[5], Nishu Yadav[6] and Md. Nazrul Islam[7]

[1]Department of Biochemistry, [2]Department of Surgery, [3]Department of Nursing, [5]Department of Anatomy, [6]Department of Microbiology, [7]Department of Physiology, Chitwan Medical College, Bharatpur, Nepal
[4]Department of Biochemistry, Birat Hospital and Research Centre, Biratnagar, Nepal

Received 25 May 2012; Revised 28 Sep 2012; Accepted 08 Oct 2012

ABSTRACT

Information on the prevalence of jaundice in the inhabitants of Chitwan is still very scanty. The National Academy of Clinical Biochemistry and the American Association for the Study of Liver Diseases consensus guidelines recommend that a specific panel of tests be used for the initial evaluation of known or suspected hepatic disease. Liver function tests were used to determine the prevalence (presence or absence) of liver disease (jaundice) in all age group populations. Liver functions were assessed in 2995 patients attending OPD of Chitwan Medical College Teaching Hospital, a tertiary care teaching hospital in the eastern region of Nepal. Liver function tests were performed using serum levels of bilirubin, total protein, albumin, serum glutamate oxaloacetate transaminase (SGOT), serum glutamate pyruvate transaminase (SGPT), and alkaline phosphatase (ALP) as indicators of liver function. Out of 2995 subjects, 99 patients (3.30%) were selectively diagnosed as jaundiced and another 99 subjects has been included in the study those are jaundice free individuals. The serum concentrations of all the parameters of liver function test in jaundiced patients were significantly higher ($p<0.05$) than those of jaundice free individuals except total protein and albumin which was significantly lower in experimental group than the control group. Therefore, from the trend of our data, we can conclude that liver dysfunction is a very common feature in the population of Chitwan.

Key words: Prevalence, jaundice and liver function test.

INTRODUCTION

The human liver contains complex parenchymal cells that perform multiple functions which are essential for life. The liver does not easily demonstrate dysfunction at least in its metabolic activities. This is because of enormous reserve capacity and marvelous regenerating power of the liver and only a small portion of the liver is enough to perform all the functions. About 75-80% of liver, need to be out of function for any of the test to be positive. As is clear from the fact that the liver has been called “a silent organ,” a diseased liver shows relatively few clinical signs unless the disease is severe or advanced. However, simple liver function tests using blood samples are widely available as part of routine health examination, providing opportunities for physicians to find abnormalities in liver function test results in daily clinical practice [1]. Symptoms appear only in end-stage liver disease, so many cases of liver disease are now identified in individuals incidentally found to have abnormal liver function tests as part of routine automated laboratory testing. Abnormal liver function tests cannot be ignored because a subgroup of these patients will have progressive and potentially life-threatening liver disease for which therapeutic interventions are often available. Even in an asymptomatic individual a careful history may identify potential causes of abnormal liver function tests [2]. The presence of jaundice is usually, but not always, a sign of liver disease. The causes of jaundice are many and range from the common to the rare. The most common causes encountered in Southeast Asian region are; infective hepatitis, obstruction to bile ducts by gall stones or tumors, alcoholic liver disease, drugs,

***Corresponding Author:** Dr. Md. Nazrul Islam**, Email:** nislam_2001@yahoo.co.in

etc [3]. Geo-cultural factors influence the prevalence of liver disease of public health importance in any country. Liver disease may vary from country to country and in the same country in different cultural groups and at different periods of time [4]. The common causes of chronic liver diseases all over the world are infection with hepatitis B virus, hepatitis C virus and alcohol abuse. The community prevalence of both hepatitis B virus and hepatitis C virus infections in Nepal are comparatively low [5].

Alcohol is the most common substance abused in Nepal and a study carried out in 2000 AD found that about 60% of the Nepalese population had experienced alcohol and 41% had taken it during the last 12 months [6]. Alcohol is associated with high morbidity and mortality; about 3.7% of the global deaths [7]. Chronic and excessive alcohol ingestion is one of the major causes of liver disease in Nepal. Till date detail study on the prevalence of jaundice in and around the population of Chitwan of eastern Nepal is scanty. Keeping in view the above facts, the present study was undertaken to assess the prevalence of jaundice based on liver function tests in the populations of Chitwan who attended the OPD of Chitwan Medical College Teaching Hospital.

MATERIALS AND METHODS

This retrospective study was carried out at the OPD of Chitwan Medical College, Bharatpur, Nepal from the period of July 2011 to March 2012. A total of 2995 subjects were surveyed for this study. Out of 2995 subjects, 99 patients were selectively diagnosed as jaundiced which constitute the "experimental group". The same number of subjects (99) has included in the study those are jaundice free individuals constitute the "control group". All the subjects selected in the present study were inhabitants of Chitwan and its surroundings. Most of the subjects of this study were from low socioeconomic families. The mean age of all subjects were found to be 52.08±13.11 years. All historical informations were obtained by interview and medical records. Records with incomplete information were excluded from the study. The subjects with acute illness at the time of the study were also excluded. Permission from the institution and the informed consent of the subjects were obtained for the study.

Methods:

A case of jaundice is diagnosed with a history of significant physical signs and supportive laboratory data of liver function tests. Abnormalities in liver function tests are increased or decreased levels of static biochemical tests, including serum glutamate-oxaloacetate transaminase (SGOT), serum glutamate pyruvate transaminase (SGPT), alkaline phosphatase (ALP), bilirubin, total protein and albumin. The tests are most frequently obtained as part of liver function test panels.

Serum levels of conjugated (direct) and total bilirubin were determined according to the method described by Kaplan [8]. The concentration of alkaline phosphatase (ALP) was determined as described by Burtis and Ashwood [9]. Serum glutamate-pyruvate transaminase (SGPT) and serum glutamate-oxaloacetate transaminase (SGOT) were determined according to the method of Wilkinson et al. [10]. The conventional Biuret method [11] was used in the estimation of protein level.

Statistical Analysis:

The statistical software SPSS (version 17) was used for data analysis. The mean values of all the parameters of liver function tests were analyzed. Data were expressed as mean ± SD. Unpaired student's t-test was used for groupwise comparisons and p-value of <0.05 was considered statistically significant.

RESULTS AND DISCUSSION

Our retrospective study indicates that jaundice should be considered as a major health problem in Chitwan of eastern Nepal. A total of 2995 subjects were surveyed for this study and finally, out of 2995 subjects, 99 patients (3.30%) were selectively diagnosed as jaundiced. When diagnosing patients with liver disorders, it is important to employ appropriate history taking and physical examination to narrow down the differential diagnoses that are suggested by patterns of abnormal liver functions and to accurately determine the causative diseases on the basis of blood tests findings.

Impairment of liver function was assessed by measurement of serum concentrations of bilirubin, protein, SGPT, SGOT and ALP. Abnormalities in liver function tests are elevated or decreased levels of static biochemical tests, including SGOT, SGPT, alkaline phosphatase, bilirubin, total protein and albumin. The tests are most frequently obtained as part of liver function tests panels. In our study, we investigated all the parameters of liver function tests and the results of liver function enzymes i.e. SGPT, SGOT and ALP are significantly elevated in the experimental group than the control group (**Table 2**) which is in accord with the earlier report that all parameters

of liver enzymes are elevated during liver dysfunction [12].

Results of our study further revealed that the other important markers of jaundice; total and direct bilirubin are also significantly high in the experimental group (**Table 1**). On the other hand, in contrary to this finding, our results revealed that serum albumin and total protein levels are significantly lower in the experimental group compared to control (**Table 1**) which corroborates well with the earlier report [13].

When liver function abnormality is found, differentiation among the following three types helps to narrow down the causative disease: 1) the liver cell damage, in which increases in transaminases (SGOT, SGPT), 2) the cholestasis, in which increases in biliary enzymes (alkaline phosphatase), and 3) the combination, in which increases in both enzymes are present. Additionally, based on the history and duration of liver function abnormality, acuteness and chronicity should be determined. But this article does not includes a working classification of liver disease, a list of liver functions with the tests appropriate to each function, and a guide to panel interpretation and further laboratory investigation. For that further detailed study is required.

In conclusion, we can say that liver function tests are used to detect, specifically diagnose, and estimate the severity of hepatic disease. This article has given emphasis on the prevalence of liver disease in the population of Chitwan but not in effective interpretation of the hepatic function panel which requires knowledge of underlying pathophysiology and the characteristics of panel tests.

Table 1: Serum levels of bilirubin, protein and albumin of control and experimental group

Parameters	Control	Experimental	P- value
Total bilirubin (mg/dl)	0.68 ± 0.19	2.25 ± 0.58	0.000
Direct bilirubin (mg/dl)	0.23 ± 0.09	1.26 ± 0.76	0.000
Total protein (gm/dl)	7.15 ± 0.83	6.45 ± 0.77	0.004
Albumin (gm/dl)	4.82 ± 0.69	4.13 ± 0.95	0.001

Values are expressed as mean ± SD (n= 99)

Table 2: Serum concentration of liver enzymes of control and experimental group

Parameters	Control	Experimental	P-value
SGOT (IU/L)	25.78 ± 3.07	128.51 ± 6.72	0.020
SGPT (IU/L)	22.12 ± 2.23	108.19 ± 4.24	0.011
Alkaline phosphatase (IU/L)	140.55 ± 28.86	440.1 ± 25.97	0.011

Values are expressed as mean ± SD (n= 99)

ACKNOWLEDGEMENT

The authors would like to thank Chitwan Medical College for providing research facilities**.** Authors are also indebted to all participants in this study for their cooperation.

REFERENCES

1. Tsubouchi H, Ido A and Mawatari S. New development in treating liver disorders: approaches to liver function test from mild to fulminant disorders. J Med Assoc Japan 2010; 53(4): 218–223.
2. Collier J and Bassendine M. How to respond to abnormal liver function tests. Clin Med 2002; 2: 406–9.
3. Gupta M, Patil R, Khan MI and Gupta SK. Retrospective hospital based study of infective causes of jaundice in Tamilnadu, India. Calicut Medical Journal 2011; 9(2):1-4.
4. Shrestha SM. Liver diseases in Nepal. Kathmandu University Medical Journal 2005; 3(2): 178-180.
5. Shrestha SM, Tsuda F, Okamoto H, et al. Hepatitis B virus subtypes and hepatitis C virus genotypes in patients with chronic liver disease in Nepal. Hepatology 1994; 19:805-809.
6. Dhital R. Alcohol and young people in Nepal. Available from: http://www.ias.org.uk/ resources/publications/theglobe/glob20010 3-04.
7. WHO sixtieth world health assembly. Evidence- based strategies and interventions to reduce alcohol- related harm. Provisional agenda item 12.7. April 5, 2007.
8. Kaplan A. Standard methods of clinical chemistry. Academic Press, New York, 1965; p 245- 256.
9. Burtis CA and Ashwood ER. Textbook of clinical chemistry. Saunders Company, Philadelphia, 1999; p. 617-721.
10. Wilkinson JH, Baron DN, Moss DW and Walker PG. Standardization of clinical enzyme assays: A reference method for aspartate and alanine transaminases. J Clin Pathol 1972; 25: 940.
11. Layne E. Spectrophotometric and turbidimetric methods for measuring proteins. Methods in Enzymology. 1957; 10: 447-455.
12. American Gastroenterological Association. Medical position statement: evaluation of liver chemistry tests. Gastroenterology. 2002; 123: 1364-66.

13. Liver Function Study Team of the Affiliate Research Group of the Japanese Society of Gastroenterology, ed. Criteria for Choosing Hepatitis Virus Markers and Liver Function Tests. Tokyo: Bunkodo Co., Ltd.; 2007: 19–29.