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Original Research Article

Clinical and biochemical profile of patients hospitalized with jaundice: Experience from a teaching hospital in north India

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ABSTRACT

Background: Jaundice is a common problem in both medical and surgical practice. For best line of management, it is very essential to differentiate all types of jaundice. The cause can often be correctly anticipated clinically but usually biochemical and radiological imaging investigations are required for confirmation. Here we present a study on clinical and biochemical profile of jaundice patients admitted in a tertiary care hospital.
Methods: It was an observational study and all patients admitted with jaundice in the department of medicine meeting inclusion/exclusion criteria were enrolled. Data was collected on a self-designed, pretested and structured format.
Results: Out of 100 patients, 77 were males, and median age of 47.5 years. Apart from jaundice, anorexia was the most common presenting complaint (90%), while ascites was the most common finding. Cirrhosis (60%) was the most common cause of jaundice. The mean total bilirubin was 7.9 mg%. Mean Hemoglobin in patients with cirrhosis was 9.7gm/dL. 78% patients of cirrhosis revealed esophageal varices. Majority (80%) showed hypoproteinemia. PT was prolonged >3sec in 87% of cases. On USG shrunken liver was noted in all patients with cirrhosis, enlarged liver was found in two patients of liver abscess while altered echotexture was seen in 66% cases. 90 patients improved, 9 died and only one was referred.
Conclusions: Alcoholic liver disease was the leading cause of cirrhosis (92%). Jaundice in general and alcoholic cirrhosis in particular affects mostly the productive age group of the male population and has a high economic burden on our society.

Keywords: Alcoholic liver disease, Cirrhosis, Jaundice

INTRODUCTION

Jaundice is a common problem in both medical and surgical practice. It is classified into three types: Pre-hepatic or hemolytic, Hepatic or hepatocellular and Post-hepatic or cholestatic or obstructive jaundice.[1] For best possible results, differentiation between types of jaundice is very important so as to decide the line of expectant management.[2] A carefully elicited history and clinical examination with judicious selection of diagnostic tests and procedures can lead to a quick diagnosis. Also, by weighing their relative risk and efficacy, the physician can better ensure the comfort, safety and the cost effectiveness of medical care.[2-4]

Though its cause can often be correctly anticipated clinically, but usually biochemical and radiological imaging investigations are required for confirmation. Due to paucity of data on jaundice from this region we planned to study the profile of jaundice patients admitted in our medicine wards. We focused mainly on the clinico-biochemical findings depending on the etiology of jaundice.

METHODS

It was a prospective observational study conducted in the department of medicine, at Dr Rajendra Prasad Government Medical College, Kangra, Himachal Pradesh. It was done after taking permission from the institutional ethical committee. The study was conducted for a period of one year from 1st June 2016 through May 2017. A total of 100 patients admitted with jaundice in the department of medicine, who satisfied the inclusion and exclusion criteria and also who gave their consent, were enrolled in the study.

Inclusion criteria

All the patients with jaundice and admitted in the medicine ward of the medical college during the study period.

Exclusion criteria

Those who were not willing to participate in the study and were below 18 years of age.

Methodology followed

A total of 100 patients were enrolled by doing consecutive sampling for a period of one year. The clinical, biochemical and socio-demographic details of the patients were collected in a self-designed, pretested and structured format. Clinical objectives were achieved by noting down a detailed history, general physical examination, chest X-ray PA view, abdominal ultrasonography, upper gastrointestinal endoscopy, final diagnosis and outcome at discharge. Biochemical objectives were achieved by doing investigations like complete blood count, liver function tests, serology for HBsAg and anti-HCV, IgM anti HBc, IgM HAV, IgM HEV, IgM scrub and IgM leptospirosis, renal function test, random blood sugar and PT-INR.

Statistical analysis

The data of all the enrolled patients was cleaned and entered in Microsoft Excel software spreadsheet. It was then analyzed using Epi info version 7.2.0.1 and the results are presented as means, standard deviations, frequencies and percentages along with various tables.

RESULTS

Out of 100 patients enrolled, majority were males (77%), with male: female ratio of 3.3:1. The median age of presentation was 47.5 years and maximum were in the age group of 51-60 years (37%) (Table 1).

Table 1: Age and sex distribution.

Age group (yrs)	Male	Female	Total %
18-20	3	2	5 (5.0)
21-30	8	2	10 (10.0)
31-40	2	4	6 (6.0)
41-50	22	10	32 (32.0)
51-60	32	5	37 (37.0)
>60	10	0	10 (10.0)
Total	77	23	100(100.0)

Table 2: Distribution of symptoms and signs as per etiology.

Symptoms	Cirrhotics (n=60)	Acute viral hepatitis (n=12)	Rickettsial (n=10)	Drug induced liver injury (DILI) (n=6)	Liver abscess (n=4)
Anorexia	60 (100%)	12 (100%)	8 (80%)	6 (100%)	4 (100%)
Abdomen distension	52 (86%)		2 (20%)		
Altered sensorium	36 (60%)		5 (50%)		
Hematemesis/ Malena	34 (56%)				
Fever	4 (7%)	10 (83%)	10 (100%)	4 (66%)	3 (75%)
Pain abdomen	12 (20%)		8 (80%)		4 (100%)
Signs					
Ascites	58 (96%)		2 (20%)		
Pedal Edema	34 (56%)		10 (100%)		
Hepatic Encephalopathy	43 (71%)				
Splenomegaly (ultrasound)	31 (51%)		5 (50%)		
Stigmata of chronic liver disease	21 (35%)				
Hepatomegaly (ultrasound)	1 (1.7%)				2 (50%)

Cause of jaundice

The most common cause of jaundice was cirrhosis (60%) followed by viral hepatitis (12%) and rickettsial 10% (scrub typhus 7%, leptospirosis 3%) cases. ACLF (Acute-on-chronic liver failure) was seen in 10% patients of cirrhosis. Amongst the cirrhosis patients, 55% patients were of ALD (Alcoholic liver disease) related cirrhosis. They were consuming liquor (both English and country) for an average of 11 years with mean dose of 90.9 gm/day (Table 2).

Laboratory parameters

The mean total bilirubin was 7.9 mg% (range 3-21mg%). Unconjugated hyperbilirubinemia was seen in 7% of these patients (mostly hemolytic anemia) (Table 3).

Table 3: Laboratory parameters.

Parameter	Mean±SD
Haemoglobin gm/dl	10.3±2.9
Total leukocyte count (TLC) mm^3 /dl	10126.7±3969.7
Platelet count thousands	131.3±82.9
Serum blood urea nitrogen mg/dl	23.8±18.4
Serum creatinine mg/dl	1.06±0.71
Serum sodium mmol/L	135.8±6.2
Serum potassium (mmol/L)	4.1±0.73
Serum bilirubin (Total) mg/dl	7.9±4.9
Serum bilirubin (conjugated) mg/dl	3.8±3.0
Aspartate aminotransferase (AST)	417.3±638.9
Alanine aminotransferase (ALT)	445.1±991.8
AST/ALT ratio	1.9±1.2
Alkaline phosphatase (ALP)	270.4±244.4
Prothrombin time- prolonged (control-12.5)	8.0±5.1
International normalized ratio (INR)	2.1±1.2
Serum protein (Total) gm/dl	6.1±0.84
Serum albumin gm/dl	2.9±0.67

Table 4: Distribution of biochemical parameters as per etiology.

	Cirrhosis	Acute Viral hepatitis (AVH)	Rickettsial	Drug induced Liver Injury (DILI)	Liver abscess	Hemolytic anemia
Haemoglobin gm/dL (range)	9.7 (4 - 12)	12.9 (10–15.6)	11.8 (8-13)	10.9 (9.2-13)	11.7 (10-13)	4.3 (3.6-5.0)
Total leukocyte count (thousands)	9220 (2970-1682)	10611 (6300-15600)	11600 (9000-15000)	11200 (9000-12800)	13982 (11200-15370)	7580 (3000-10800)
Platelets (thousands/ microliter)	105 (25-288)	239 (138-382)	78 (22-188)	248 (230-264)	183 (146-272)	106 (40-130)
Bilirubin-total mg/dl	7.3(1.4 - 21)	13.1(4.8-26)	8.7(4-11)	5.4(4.2-10.2)	5.7(3.7-11.4)	6.2(4-9.6)
Bilirubin-conjugated mg/dl	3.48(1 - 10)	7(2-15)	5.1(2-7)	3.1(2-5)	3.2(2-7)	1.2(1-2)
Proteins-total gm/dl	6.1(5 - 8)	6.9(6-8)	5.9(5-7)	6.2(6-7)	5.5(4-7)	6.4(5-8)
Albumin gm/dl	2.7 (1.8 - 3.7)	3.8 (3.4-4.7)	2.5 (2-3)	3.5 (2.6-4.6)	2.4 (2.1-3.0)	3.9 (3.2-5)
Alanine aminotransferase (ALT)	230(62-1844)	253(55-700)	455(162-647)	343(229-389)	643(443-719)	130(30-330)
Prothrombin time-PT (Sec prolonged)	9.5 (3 - 20)	6(3-20)	5.7(2-10)	3.1(0-6)	6.7(5-7.5)	3.8(0-6)
International normalized ratio (INR)	2.19(1 - 4)	1.4(1-3)	1.8(1-3)	1.5(1-2)	1.89(1.8-2)	1.4(1-2)

Biochemical parameters

Bilirubin

Total bilirubin values were divided into 3 groups: Group I with total bilirubin <7 mg%; mostly in ALD cirrhosis cases. Group II with total bilirubin 7-15 mg%; were cases of acute viral hepatitis and Rickettsial infection. Group III with bilirubin >15mg%; seen in 11%, consisted cases of ACLF and acute viral hepatitis.

Aspartate aminotransferase (AST)/alanine aminotransferase (ALT) ratio

In 52 out of 60 patients with cirrhosis AST/ALT ratio was more than one. AST/ALT ratio between 1-2 and >2 was seen in 36% and 57% of cirrhotics respectively. 90% of the patients with rickettsial infection showed AST/ALT ratio between1-2. In viral hepatitis AST/ALT ratio was <1 in 75% of the patients.

Proteins and albumin

Majority of the patients showed hypoproteinemia (<6gm/dL in 80%) and hypoalbuminemia (<3.5gm/dL in 93%).

Imaging

Pleural effusion was noted on chest x-ray, mostly in patients of cirrhosis (10%), and in one case each of rickettsial, liver abscess and Drug induced liver injury (DILI). Ultrasound abdomen was normal in 46% of the patients. Shrunken liver was noted in all patients with cirrhosis except those who had associated hepatocellular carcinoma. Enlarged liver was seen in two patients of liver abscess, altered echotexture in 66% of cases and ascites in 62%. Most of them had cirrhosis. On endoscopy, esophageal varices were seen in 78% patients of cirrhosis, with grade-1 varices in 24(51%) patients, grade-2 in 16(34%) and Grade-3 in seven (15%) patients. Portal hypertensive gastropathy (PHG) was present in 38(63%) patients, all showing mild PHG. (Table 3 and Table 4).

DISCUSSION

Signs and Symptoms

In patients hospitalized with jaundice, we found decompensation of cirrhosis to be the most commonest cause. The average age of patients was 47.7 ±12.7 years, majority between 41-60 years (69%). Hung et al reported mean age of 53.8 ± 16.9 years and maximum cases were also in the range of 40-59 years (41%).[5] Similarly, in Chacko and Chacko, Sarin et al and Maskey et al studies, average age of patients was 48±11 years, 43±8.7 years and 49.06±11.27 years respectively.[6,7,8] Other studies conducted on alcoholic liver disease by Hemang Suthar et al in India, and Pathak et al in Nepal, mean age was 41 years and 52 years respectively.[9,10]

The male: female ratio in our study was 3.3:1 while L.N. Hung et al. reported a male: female ratio of 1.3:1.[5] Maskey et al. reported a ratio of 2.1:1, while in Bangladesh it was 3.16:1 which is comparable with our study.[8,11]

Sarin et al found that the male to female ratio in young cirrhotics was 4.25:1.[12] This is in contrast to a ratio of 1.46:1 found by Whitehead et al in South West Wales and few other studies from developed world showing similar ratios.[13] This is due the fact that alcoholism amongst females is more common in developed world while it is still a taboo in our society. In our study large number of alcoholic cirrhotic patients, who were mostly males, got admitted from surrounding areas where alcoholism is quite prevalent.

We found anorexia the most common symptom (90%) followed by distension of abdomen (54%). Maskey et al, Jatin et al and Suthar et al et al found abdominal distension as a presenting complaint in 84%, 71% and 60% of their patients respectively.[8,9] In another study conducted in Peru, the main clinical presentation was upper gastrointestinal bleeding, followed by ascites and encephalopathy.[14] Hajiani et al also found abdominal distension as the chief complaint in most of their patients.[15]

Our study found hepatic encephalopathy in 43% cases, similar to those reported by Suthar et al in 34% and Sarin et al in 20.6% of young cirrhotics and 27.4% of adult cirrhotics.[9,7] Among the stigmata of chronic liver disease Dupuytren's contracture was most common in our study and was present in 9% of cases followed by spider naevi in 5%. Other studies found the stigmata in 8.8% and 4% respectively.[9,10]

Cause of Jaundice

The most common etiology was alcohol in 55% of the patients. Most studies on drinking frequency and risk of alcoholic cirrhosis have found that daily drinking compared to episodic or binge drinking is associated with an increased risk.[16-19] The study by Gro Askgaard et al showed that there is a dose-response relationship between alcohol amount and alcoholic cirrhosis.[20]

Second commonest cause of jaundice was viral hepatitis (12%), which in turn is caused by Hepatitis E more frequently than Hepatitis A. Results are comparable with Hung et al5 study, which showed 8.9% cases with cause of jaundice as hepatitis, and Mokta et al reported more prevalence of Hepatitis E (21%) than Hepatitis A (4%).[21]

Regarding scrub typhus, Singh et al found fever, myalgias, headache, vomiting, diarrhoea, breathlessness, petechiae and jaundice to be the most common

features.[22] Mokta et al concluded that scrub typhus was the most common febrile jaundice in Himachal Pradesh and females outnumbered males (0.18:1). [21] 10% of cases in our study were of rickettsial disease mostly caused by scrub typhus. All were females. This could be due to the fact that in rural areas females are engaged in outdoor activities like gathering fodder for cattle and working in fields which puts them at risk of scrub typhus infection. This is comparable with our study in terms of male: female ratio, most common presenting complaints of fever, anorexia and abdominal pain.

Liver abscess was the diagnosis in 4% of our cases with male predominance. Fever, anorexia and pain abdomen were the most common symptoms. All patients showed AST/ALT ratio of >1. Lee et al found males: female ratio of 2:1 and this was confirmed by Pang et al.[23,24] Similarly, findings were reported by other studies also.[22-26]

Investigations

The overall mean hemoglobin was 10.3±2.9 gm/dl which is comparable to that by Maskey et al8 i.e. 9.72±2.85 gm/dl. Other studies by Suthar et al and Sarin et al reported mean Hb of 10.1 gm/dl and 10.2 gm/dl respectively.[9,7] This reflected the already known fact that anemia of diverse etiology was a common complication of liver diseases. We found mean TLC of 10,126 ± 3,969 mm.[3] It matched with the studies by Pathak et al and Suthar et al.[10,9]

In patients with rickettsial diseases mean TLC count was 11,600, platelets were 78,000 and albumin mean was 2.5g/dl. These findings are consistent with Singh SP et al findings, who showed leukocytosis in 51%, thrombocytopenia (<1,50,000) in 46.8% and albumin of < 3g/dl in 51.1% of patients.[22]

Pathak et al found Sr bilirubin (T) 4.05±4.5 mg/dL and bilirubin(C) 2.53±3.56 mg/dL.[10] The mean Sr albumin of 2.9±0.67 gm/dL is comparable to the studies of Suthar et al and Chacko et al.[9,6] Direct/Total bilirubin percentage (>60%) was observed in 20% of cases. These were cases with cirrhosis, rickettsial and acute viral hepatitis. The pathologies without increase in direct bilirubin (D/T<20%) were found in hematology diseases (100%). These findings are also comparable with study done by Hung et al.[5]

CONCLUSION

The diagnosis of jaundice may be easy but differential diagnosis is not that simple. It is very important for physicians to be aware of all types jaundice, correlate the positive findings and various parameters, so that it is detected, classified and treated early. This study also emphasizes that jaundice is mostly a disease of males in the most productive age group (41-60 years) of their life. 92% of cirrhosis was due to alcoholic liver disease, contributing to 90% mortality, highlighting the fact that it has a high economic burden on our society. This calls for sustained health awareness and mass media campaigns with adequate counseling and de-addiction centres to stop/reverse the trend of alcoholism in our society.

Being the first study in the region, the results will help clinicians to suspect and keep in mind the common causes of jaundice, proceed and then treat accordingly. Further research with larger sample size will shed more light on the causes and various clinical complications.

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REFERENCES

1. Sherlock S. Diseases of Liver and Biliary system, 11th Ed. Chapter 13: Cholestatsis; 2001:223.
2. Chopra S, Griffin PH. Laboratory tests and diagnostic procedures in evaluation of liver disease. Am J Med. 1985;79(2):221-9.
3. Schenker S. Differential diagnosis of jaundice: a report of a prospective study of 61 proved cases. Am J Dig Dis. 1962:7:449-63.
4. O'Connor KW, Snodgrass PJ, Swonder JE, Mahoney S, Burt R, Cockerill EM, et al. A blinded prospective study comparing four current non-invasive approaches in the differential diagnosis of medical versus surgical jaundice. Gastroenterol. 1983;84(6):1498-1504.
5. Hung LN, Huong L, An T. Jaundice in Adult In-Patients at a Tertiary General Hospital. J Biosci Med. 2015;3(02):1-1.
6. Chacko RT, Chacko A. Serum and muscle magnesium in Indians with cirrhosis of liver. I Indian J Med Res. 1997;106:469-74.
7. Sarin SK, Dhingra N, Bansal A, Malhotra S, Guptan RC. Dietary and nutritional abnormalities in alcoholic liver disease: a comparison with chronic alcoholics without liver disease. Am J Gastroenterol. 1997;92(5):777-83.
8. Maskey R, Karki P, Ahmed SV, Manandhar DN. Clinical profile of patients with cirrhosis of liver in a tertiary care hospital, Dharan, Nepal. Nepal Med Coll J. 2011;13(2):115-18.
9. Suthar HN, Suthar KD, Mewada BN. Clinical profile of cases of alcoholic liver disease. Int J Med Sci Public Health. 2013;2(2):394-8.
10. Pathak OK, Paudel R, Panta OB, Pant HP, Giri BR, Adhikari B. Retrospective study of the clinical profile and prognostic indicators in patients of alcoholic liver disease admitted to a tertiary care teaching hospital in Western Nepal. Saudi J Gastroenterol. 2009 Jul-Sep;15(3):171-5.
11. Ahsan T, Ahsan M, Kamal MM, Hossain KJ, Haque ME, Islam SKN. Lifestyle, nutritional status and

seroclinical profile of liver cirrhotic patients. Bangladesh Med J. 2007;36(2):44-7.
12. Sarin SK, Lahoti D, Saxena SP, Murthy NS, Makwana UK. Prevalence, classification and natural history of gastric varices: a long-term follow-up study in 568 portal hypertension patients. Hepatology. 1992;16(6):1343-49.
13. Whitehead MH, Hainsworth I, Kingham JGC. The causes of obvious jaundice in South West WALES: Perceptions versus reality. Gut. 2001;48(3):409-13.
14. Hajiani E, Hashemi SJ, Masjedizadeh R, Ahmadzadeh S. Liver Cirrhosis Seen in GI Clinics of Ahvaz. Iran. Govaresh. 2012;17(3):178-82.
15. Bustios C, Davalos M, Roman R, Zumaeta E. Clinical and epidemiological profile in the liver unit at Edgardo Rebagliati Martins National Hospital. Rev Gastroenterol Peru. 2007;27(3):238-45.
16. Kamper-Jørgensen M, Grønbaek M, Tolstrup J, Becker U. Alcohol and cirrhosis: dose-response or threshold effect?. J Hepatol. 2004;41(1):25-30.
17. Hatton J, Burton A, Nash H, Munn E, Burgoyne L, Sheron N. Drinking patterns, dependency and life-time drinking history in alcohol-related liver disease. Addiction. 2009;104(4):587-92.
18. Stokkeland K, Hilm G, Spak F, Franck J, Hultcrantz R. Different drinking pattern for women and men with alcohol dependence with and without alcoholic cirrhosis. Alcohol. 2008;43(1):39-45.
19. Sørensen TI, Orholm M, Bentsen KD, Høybye G, Eghøje K, Christoffersen P. Prospective evaluation of alcohol abuse and alcoholic liver injury in men as predictors of development of cirrhosis. Lancet. 1984;2(8397):241-44.
20. Askgaard G, Grønbæk M, Kjær MS, Tjønneland A, Tolstrup JS. Alcohol drinking pattern and risk of alcoholic liver cirrhosis: a prospective cohort study. J Hepatol. 2015 May;62(5):1061-7.
21. Mokta J, Yadav R, Mokta K, Panda P, Ranjan A. Scrub typhus the most common cause of febrile jaundice in tertiary care hospital of Himalayan state. J Assoc Physicians India. 2017;65(8):47-50.
22. Singh SP, Singh R, Ahmad N. A study of complications of scrub typhus in a tertiary health care institute of Uttarakhand, India. Int J Res Med Sci. 2014;2(1):246-49.
23. Lee KT, Wong SR, Sheen PC. Pyogenic liver abscess: an audit of 10 years' experience and analysis of risk factors. Dig Surg. 2001;18(6):459-65.
24. Pang TC, Fung T, Samra J, Hugh TJ, Smith RC. Pyogenic liver abscess: An audit of 10 years' experience. World J Gastroenterol. 2011;17(12):1622-30.
25. Jha AK, Das A, Chowdhury F, Biswas MR, Prasad SK, Chattopadhyay S. Clinicopathological study and management of liver abscess in a tertiary care center. J Nat Sc Biol Med. 2015;6(1):71-5.
26. Chen CH, Wu SS, Chang HC, Chang YJ. Initial presentations and final outcomes of primary pyogenic liver abscess: a cross-sectional study. BMC Gastroenterol. 2014;14:133.

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