

CASE REPORTS ON SERUM HYPERBILIRUBINEMIA IN ADULTS

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ABSTRACT

Jaundice is due to increased bilirubin levels in the blood which is called hyperbilirubinemia. Jaundice is of three types: pre-hepatic, hepatic (hepatocellular) and, post-hepatic. Jaundice in adults is caused by various conditions which affects the red blood cells, the liver cells, bile ducts within the liver, and the common bile duct outside the liver. Three patients were presented with very high bilirubin levels in the department of general medicine, Sree Balaji medical College and hospital. Among them two males had alcohol-induced liver disease, female had viral hepatitis with occasional abdomen pain as their only symptoms. Their sclera had yellowish discoloration. Both the patients were conscious and well oriented without any other signs of such high levels of bilirubin. These high levels were estimated after diluting and processing the samples as the linearity of bilirubin detection was very much less than the patients' bilirubin levels. Adults with very high serum hyperbilirubinemia can be released with dilutions without hesitation or delay, according to these case reports. These findings will raise the awareness of laboratory biochemists and treating physicians to the presence of such high values in patients who do not exhibit the associated symptoms.

KEYWORDS: Jaundice, hyperbilirubinemia, alcoholic liver disease, serum bilirubin, linearity.

INTRODUCTION

In the systemic circulation, bilirubin is the end product of heme catabolism. It is produced by the enzyme heme oxygenase (HMOX), which breaks down cyclic tetrapyrrole heme into biliverdin, carbon monoxide, and ferrous iron.^[1] The human body produces approximately 4 mg per kg of bilirubin per day through heme metabolism. Approximately 80% of the heme moiety is derived from red blood cell catabolism, with the remaining 20% resulting from ineffective erythropoiesis and breakdown of muscle myoglobin and cytochromes.^[2,3] The liver transports bilirubin from the plasma to the liver for conjugation and excretion. Many factors influence serum bilirubin concentrations, including cigarette smoking, gender, fasting, use of various drugs and/or plant products, altitude, race, and age.^[4] Jaundice is a yellowish discoloration of the skin, mucous membranes, and eye sclera caused by high levels of conjugated and unconjugated bilirubin in the blood (hyperbilirubinemia).^[5] Jaundice is of three types: pre-hepatic, hepatic (hepatocellular) and, post-hepatic. The most common cause of prehepatic jaundice is a pathologically increased rate of red blood cell (erythrocyte) hemolysis caused due to conditions like Hemolytic anaemia, Gilbert's Syndrome and Crigler-Najjar syndrome. Hepatic cell dysfunction occurs in hepatocellular (or intrahepatic) jaundice.^[6] Hepatic

jaundice can be caused by viruses such as Hepatitis A, chronic hepatitis B and C, Epstein-Barr virus infection, alcohol, autoimmune disorders, genetic metabolic defects, and medications.^[7] The liver loses its ability to conjugate bilirubin, but it also compresses the intra-hepatic portions of the biliary tree, causing some obstruction. This results in the presence of both unconjugated and conjugated bilirubin in the blood. In adults jaundice can be an indicator of significant underlying disease. The evaluation of jaundice relies on the history and physical examination. Jaundice is typically seen when the level of bilirubin in the blood exceeds 2.5-3 mg/dL. There were three similar cases of hyperbilirubinemia reported in the clinical biochemistry laboratory. These patients were found to have very high bilirubin levels but both the patients were conscious and well oriented without any other signs of such high levels of bilirubin.

The serum estimation of total and direct bilirubin levels (Liver function test) was done in automatic biochemistry analyser MINDRAY BS480 by Vox method. The linearity of total bilirubin and direct bilirubin were. Such high levels of serum bilirubin in adults were not a usual phenomenon.

CASE REPORT

There were three cases presented with very high bilirubin levels in the department of general medicine, in a tertiary hospital in the year 2021. Among them two males had alcohol-induced liver disease, female had viral hepatitis

with occasional abdomen pain as their only symptoms. Their sclera had yellowish discoloration. Both the patients were conscious and well oriented without any other signs of such high levels of serum bilirubin.

LAB INVESTIGATIONS

PARAMETERS	CASE 1 44 years Male	CASE 2 37 years Female	CASE 3 57 years Male
Liver function test:			
Total bilirubin	39.3 mg/dL	65.4 mg/dL	87.8 mg/dL
Direct Bilirubin	23.1 mg/dL	59.9 mg/dL	49.0 mg/dl
Indirect bilirubin	16.2 mg/dL	5.5 mg/dL	38.8 mg/dl
SGOT	142 U/L	150 U/L	175 U/L
SGPT	109 U/L	130 U/L	149 U/L
Alkaline phosphate	86 U/L	140 U/L	153 U/L
GGT	73 U/L	60 U/L	72 U/L
Total protein	5.6 g/dL	6.0 g/dL	5.8 g/dL
Albumin	1.2 g/dL	1.0 g/dL	1.1 g/dL
Globulin	4.4 g/dL	5.0 g/dL	4.7 g/dL

TREATMENT

Patients with alcohol induced liver disease were treated with abstinence from alcohol medication to reduce inflammation of the liver and nutritional support. Female patient with viral hepatitis was treated with antiviral medications

DISCUSSION

High serum bilirubin levels were common in neonates due to physiological conditions that caused jaundice. Serum bilirubin levels this high in adults are extremely unusual. That too patients without symptoms of hyperbilirubinemia. Such high levels of serum bilirubin cannot be estimated directly. Dilutions are required to arrive at the exact patient value of serum bilirubin.^[8] In all the cases dilution of 1 in 10 was carried out to estimate bilirubin levels. A proper internal quality control and dilution of serum sample helps in estimating the correct bilirubin values.

CONCLUSION

These case reports show that adults with very high serum hyperbilirubinemia can be released with dilutions without hesitation or delay. These findings will alert laboratory biochemists and treating physicians to the presence of such high values in patients who do not exhibit the associated symptoms.

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