ELEVATED TRANSAMINASES AS PREDICTOR OF MORTALITY IN MUSHROOM POISONING PATIENTS

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ABSTRACT

BACKGROUND
Acute liver failure and complications of liver injury were the most common causes of death in patients with mushroom poisoning.

Aim - We studied the liver function tests in all patients coming to our hospital with mushroom poisoning induced acute liver failure. We tried to correlate the elevated transaminase levels with the mortality of these patients.

MATERIALS AND METHODS
All patients coming to our hospital with mushroom poisoning in the Spring of 2014 were studied. A detailed history, clinical examination and laboratory investigations were done. Serum bilirubin and fraction was done in all cases of acute liver failure by modified Jendrassik and Grof method,1 Aspartate Aminotransferase (AST) and Alanine Aminotransferase (ALT) were done by IFCC kinetic method.2,3

RESULTS
29 patients were admitted to our hospital with acute liver failure following mushroom poisoning. One (1) patient absconded and two (2) patients discharged against medical advice. 26 patients were studied and evaluated in our study. 10 were male and 19 were female patients. Although 18 patients survived and 11 patients expired, 16 of the surviving patients were studied and 10 patients who died were included in our study. Serum bilirubin and unconjugated bilirubin were significantly higher in the patients who died signifying haemolysis. Aspartate Aminotransferase (AST) (3549±150 vs. 434.7±100) and Alanine Aminotransferase (ALT) (5549±100 vs. 707.5±110) were significantly higher in the group who died due to mushroom poisoning. Prothrombin time was also significantly increased in patients who died.

CONCLUSION
Raised serum bilirubin, unconjugated bilirubin, aspartate aminotransferase (AST), alanine aminotransferase (ALT) and Prothrombin time were predictors of mortality in patients with mushroom poisoning.

KEYWORDS
Mushroom Poisoning, Elevated Transaminases, AST, ALT.


BACKGROUND
Mushrooms are fungi that grow in damp clime on dead plants and animals. They are also edible delicacies although some have toxins responsible for mushroom poisoning. Poisonous varieties of mushrooms number approximately 100 (One hundred) among the more than 5000 (five thousand) species. Out of them, only about 32 (thirty two) species have been associated with fatalities.1 Greater than 90% of cases of fatal poisoning are caused by Amanita phyllodes (death cap) or Amanita verna (Destroying angle). The severity of mushroom poisoning usually depends on the type of mushroom, amount of mushroom ingested, pre-existing hepatic disease and a host of other factors.

Alpha-Amatoxin is thermostable, can resist drying for years, and is not inactivated by cooking. Rapidly absorbed through the gastrointestinal tract, the amatoxin reaches hepatocytes through the enterohepatic circulation and inhibits production of messenger RNA and protein synthesis, leading in turn to cell necrosis. Though mushroom poisoning is a rare presentation, it has been frequently reported from Himalayan foothills including tropical forest areas of North East India. Most of the reported cases of Mushroom poisonings and deaths were probably due to signs and symptoms associated with amatoxin poisoning. Acute liver failure and complications of liver injury was the most common cause of death along with circulatory failure. We report a case series of 29 (Twenty nine) cases of mushroom poisoning with hepatic failure and looked at the liver function test.

Aims and Objective
We studied the liver function tests in all patients coming to our hospital with mushroom poisoning induced acute liver failure. We tried to correlate the elevated transaminase levels with the mortality of these patients.
MATERIALS AND METHODS
All patients coming to our hospital with mushroom poisoning in the Spring of 2014 were studied. A detailed history, clinical examination and laboratory investigations were done. Serum bilirubin and fraction was done in all cases of acute liver failures by modified Jendrassik and Grof method, Aspartate Aminotransferase (AST) and Alanine Aminotransferase (ALT) were done by IFCC kinetic method.

Alkaline Phosphatase was done by pNPP kinetic method, Gamma-Glutamyl Transpeptidase was done by IFCC kinetic method and Serum creatinine was done by Jaffe method in the Siemens Dimension RxL autoanalyser instrument.

RESULTS
29 (twenty nine) patients were admitted to our hospital with acute liver failure following mushroom poisoning. One (1) patient absconded and two (2) patients discharged against medical advice. 26 (twenty six) patients were studied and evaluated in our study. 10 (ten) were male and 19 (nineteen) were female patients. Although 18 (eighteen) patients survived and 11 (eleven) patients expired, 16 (sixteen) of the surviving patients were studied and 10 (ten) patients who died were included in our study.

Despite adequate treatment 16 patients (61.54%) who survived and 10 patients (38.46%) who expired were included in our study as they underwent all the required blood investigations. We compared the Liver function test in those patients who survived and those who expired.

<table>
<thead>
<tr>
<th>Laboratory Parameters</th>
<th>Patient Who Died N = 10 (Mean±SD)</th>
<th>Patients Who Survived N = 16 (Mean±SD)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Total Bilirubin</td>
<td>9.35±2</td>
<td>2.49±0.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Highest Conjugated Bilirubin</td>
<td>1.08±1</td>
<td>1.01±0.2</td>
<td>Not significant</td>
</tr>
<tr>
<td>Highest Unconjugated Bilirubin</td>
<td>8.13±1.5</td>
<td>1.67±0.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Highest AST</td>
<td>3549±150</td>
<td>4347±100</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Highest ALT</td>
<td>5549±100</td>
<td>7075±110</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Highest ALP</td>
<td>349±120</td>
<td>104±50</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Highest GGTP</td>
<td>90±30</td>
<td>84±10</td>
<td>Not significant</td>
</tr>
<tr>
<td>Highest PT</td>
<td>70.8±10</td>
<td>10.6±5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Highest INR</td>
<td>7.1±2</td>
<td>1.1±0.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Highest S. Creatinine</td>
<td>1.1±0.5</td>
<td>1.1±0.4</td>
<td>Not significant</td>
</tr>
</tbody>
</table>

Highest serum Bilirubin and unconjugated bilirubin were significantly higher in the patients who died signifying haemolysis. Aspartate Aminotransferase (AST) (3549±150 vs. 4347±100) and Alanine Aminotransferase (ALT) (5549±100 vs. 7075±110) were significantly higher in the group who died due to mushroom poisoning. Prothrombin time was also significantly increased in patients who died.
Aminotransferase (ALT) was 707.5±110 U/L in patients who survived. This shows that higher AST and ALT have significant predictive value in case of mortality of patients coming with mushroom poisoning. This increased level of AST and ALT can be used as an indicator for selection of patients who will benefit from liver transplantation and referral to a higher center for further management. Singh S et al noted that the early rise in serum AST/ALT levels was associated with high mortality. Study from the same institution has previously described prevalence of mushroom poisoning in children to be 3.2% out of all accidental poisonings.8

In one of our previous published study of 48 (forty eight) patients of mushroom poisoning, we found that the patients who expired had a higher bilirubin level (mean 7.17 mg/dL) than those who survived (mean 2.58 mg/dL). The prothrombin time was also higher (mean 16.5) compared to patients who survived (11.85). Liver enzymes were also elevated (AST mean 1323, ALT mean 2435) in patients who expired in comparison to those who survived (AST mean 224, ALT mean 324).9

In this study, we have noted that serum bilirubin, unconjugated bilirubin, aspartate aminotransferase (AST), alanine aminotransferase (ALT) and Prothrombin time were significantly raised in the patients who died with acute liver failure following mushroom poisoning.

CONCLUSION
Raised serum bilirubin, unconjugated bilirubin, aspartate aminotransferase (AST), alanine aminotransferase (ALT) and Prothrombin time were predictors of mortality in patients with mushroom poisoning.

REFERENCES