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Original article

Study of hepatic dysfunction in children with tuberculosis with antituberculous therapy at tertiary care hospital

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Abstract

Introduction: Recent dose increases for isoniazid (INH), rifampicin (RMP), and pyrazinamide (PZA), the essential pediatric antituberculous drugs recommended by the World Health Organization, have raised concerns about the risk of hepatotoxicity. With this view present study was planned to assess study of hepatic dysfunction in children with tuberculosis with antituberculous therapy at tertiary care hospital.

Material and methods: 50 children with tuberculosis on ATT were included in present study . Study was conducted at our Institute in last one year. Serum glutamic pyruvic transaminase (SGPT) level was measured at the beginning, after 15 days of starting ATT, at the end intensive phase and then if the patient developed symptoms of hepatic dysfunction. A value 3 times the normal value of the testing laboratory was considered to be significant for liver dysfunction.

Results: 6 out of 50 children developed drug induced hepatic dysfunction, of which 2 patients had 2 episodes of liver dysfunction while 3 had 1 episode of liver dysfunction. One developed symptom of hepatitis in the form of jaundice and hepatomegaly. All the patients developing liver dysfunction were in the intensive phase of treatment. The mean age of the children developing liver dysfunction was 3.8 ± 2.25 years.

Conclusion: Herewith strongly concludes that regular monitoring of SGPT levels is recommended for all children with her ATT under 4 years of age.

Key words: antituberculosis chemotherapy, hepatotoxicity, children, isoniazid, rifampicin, pyrazinamide.

INTRODUCTION:

Recent increases in the dosages of the essential antituberculosis agents isoniazid (INH), rifampicin (RMP), pyrazinamide (PZA) for use in children recommended by World Health Organization have raised concerns regarding the risk of hepatotoxicity. [1]The single greatest concern in tuberculosis management is drug-induced liver dysfunction, with a mortality rate of up to 13%. For antituberculosis drugs, the main risk is hepatotoxicity, with three drugs identified as essential by the World Health Organization (WHO): isoniazid (INH), rifampicin (RMP), and pyrazinamide (PZA). , there is such a risk.[2,3] Against this background, the present study was designed to assess the assessment of liver dysfunction in tuberculosis children receiving antituberculous therapy in a tertiary care hospital.

MATERIAL AND METHODS:

The present study was conducted at our department. Sample size was estimated with the help of expert. 50 children with tuberculosis on ATT were included in present study. Study was conducted at our Institute in last one year. We included all children attending clinic with tuberculosis, with regular visit , with written informed consent of their parents .

Serum glutamic pyruvic transaminase (SGPT) level was measured at the beginning, after 15 days of starting ATT, at the end intensive phase and then if

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the patient developed symptoms of hepatic dysfunction. A value 3 times the normal value of the testing laboratory was considered to be significant for liver dysfunction.

RESULTS:

Table 1) Distribution of cases as per developing hepatotoxicity

Episodes of hepatic dysfunction	Number of children (N=50)	Percentage
Two	2	4
One	3	6
None	44	88

In our study, 6 out of 50 children developed drug induced hepatic dysfunction; of which 2 patients had 2 episodes of liver dysfunction while 3 had 1 episode of liver dysfunction.
One developed symptom of hepatitis in the form of jaundice and hepatomegaly. All the patients developing liver dysfunction were in the intensive phase of treatment.

Table 2) Age wise distribution of patients

Age (Years)	Number of children (N=6)	Percentage
< 3	1	2
3 -5	5	10
> 5	0	0

The mean age of the children developing liver dysfunction was 3.8 ± 2.25 years.

DISCUSSION:

Viral infectious hepatitis, which is prevalent in developing countries, predisposes to and can be confused with ADIH, which has a significant impact on the interpretation of the results of many studies. We were unable to draw firm conclusions about the role of hepatitis B virus infection in disease or exacerbation.[3,4] In our study, 6 of her 50 children developed drug-induced liver dysfunction, of whom 2 of her patients had her 2 episodes of liver dysfunction and 3 was found to have had one episode of liver dysfunction in her. Symptoms of hepatitis developed in the form of jaundice and hepatomegaly. All patients who developed liver dysfunction were in the intensive care phase of treatment. The mean age of children who developed liver dysfunction was 3.8 ± 2.25 years.

Despite initial complacency about hepatotoxicity, along with reports of hepatotoxicity in adults, RMP and her subsequent introduction of PZA into routine care led to caution in handling children. Since about 1970, reports on the treatment of children with tuberculosis disease often refer to the occurrence of jaundice in children undergoing LFT assessment or INH, RMP, and PZA.[5,6,7]

The situation is different for children being treated for tuberculosis. A similar proportion of children (approximately 10%) have elevated serum transaminases, but a much greater proportion of children with latent infection are jaundiced. This percentage ranges from 1% to less than 50% in some studies of children treated for TBM. Several factors can be important here.[8]

In summary, hepatic dysfunction is common in children receiving her ATT, especially

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in <3% of her children and in ICU with her INH, rifampicin, and PZA. Therefore, it is advisable to regularly monitor her SGPT levels in a child with tuberculosis during treatment, especially during the intensive care stage. The 1997 Indian Academy of Pediatrics (IAP) consensus statement 7 and the latest 2006 WHO guidelines for children22 state that biochemical monitoring is not necessary. Policy revisions may be required and monitoring will be essential.[8]

Shiow-Huey Chang et al. Reported that 13 patients had an underlying tuberculosis infection and developed isoniazid hepatotoxicity (0.8% of all 1582 patients who started isoniazid; 1.1% of 1235 patients who completed treatment). He concluded that hepatotoxicity of isoniazid rarely occurs in children with latent tuberculosis infection and usually reverses when isoniazid is discontinued. Evidence of late-onset drug-induced liver injury demonstrates the importance of monitoring symptoms and serum transaminases during isoniazid treatment.[9]

The incidence of isoniazid hepatotoxicity in children receiving isoniazid treatment for latent tuberculosis infection is low. However, isoniazid hepatotoxicity can lead to liver failure and death. The risk of elevated levels of INH or its metabolites, however, was the finding that a child who was phenotypically a slow acetylator of her INH was more likely to have elevated transaminase levels than normal, as was the case in adults.[10,11]

CONCLUSION:

Herewith we strongly conclude, regular monitoring of SGPT levels is recommended in all children on ATT below the age of 4 years

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