

Retrospective Serology Survey of Leptospirosis and Viral Hepatitis in Patients of Acute Febrile Illness with Jaundice - A Study from Tertiary Care Hospital of Sub-Himalayan Region

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Abstract:- Background : Mixed infection is a challenge to the treating clinician. Vial hepatitis and leptospirosis co-infection has not been frequently referred to in medical literature as both present as acute febrile illness with jaundice and may reveal non-specific laboratory findings. Hepatitis A infection and leptospirosis are prevalent in developing countries

Objective: This retrospective study is aimed at determining the presence of hepatitis and leptospirosis co-infection among patients of acute febrile illness with jaundice.

Methods: Retrospective data of IgM ELISA for leptospirosis, anti-HAV antibodies and anti-HEV antibodies ELISA was retrieved for analysis. Serum samples of patients of acute febrile illness with jaundice were collected and processed. A total of 92 serum samples were received over a period of one year from April 2022 to March 2023 for IgM ELISA for leptospirosis, anti-HAV antibodies and anti-HEV antibodies ELISA.

Results: Leptospirosis was diagnosed in 22(23.91%) out of 92 patients. Among these 22 leptospirosis positive samples hepatitis A infection co-infection was diagnosed in 07 (31.81%) , while hepatitis E infection was diagnosed in 2 serum samples out off 66 (71.74%) leptospirosis negative samples.

Keywords :- HAV, HEV, ELISA, AST, ALT, MOF, ARDS.

I. INTRODUCTION

Acute viral hepatitis (HAV, HEV) and leptospirosis were prevalent in developing countries with socioeconomically disadvantage communities like India. Hepatitis A infection accounts for up to 50% of acute viral hepatitis in USA¹. Hepatitis A infection present with jaundice after prodromal illness. Leptospirosis presents with mild anicteric form to severe icteric form, Weil's disease

with multi-organ failure (MOF). Icteric form occurs in <10% of cases of leptospirosis¹. The exposure to water contaminated with rat urine is major cause of leptospirosis while feco-oral route is predominant cause of spread of hepatitis A infection. Both Hepatitis A and leptospirosis can present with increased levels of liver enzymes (AST & ALT)^{2,3,4}

Leptospirosis and hepatitis E infection are zoonotic diseases and are endemic in tropics and subtropical climate caused by contact with *Leptospira* contaminated environment during agricultural or recreational practices or when waste disposal system are ineffective^{5,6}. The disease is considered an occupational hazard for agricultural and dairy farmers, sewer workers, veterinarian , fishing industry workers and military personal. It is also recognized as recreational hazard among campers and athletes exposed to water contaminated with leptospira⁷. HEV transmission occurs mainly by feco-oral route transmitted via sewage contamination of drinking water or food. The presentation in both these infections is highly variable with progression to MOF and ARDS(acute respiratory distress syndrome) in few cases⁸.

II. MATERIAL AND METHODS

The retrospective study was conducted in department of Microbiology, Dr.RPGMC Kangra at Tanda H.P. over a period of one year w.e.f. April 2022 to March 2023. The serum samples were tested by using ELISA IgM test (Recombilisa IgM ELISA kit) for leptospirosis, ELISA IgM test for HAV(BioNeovan co.,ltd) and ELISA IgM test for HEV (Hightop Biotech co., ltd).

III. RESULTS

- A total of 92 serum samples of patients with acute febrile illness with jaundice were received w.e.f. April 2022 to March 2023.
- In 92 samples, 56 (60.87%) were males and 36 (39.13%) were females with M:F ratio of 1.6:1.
- Out of 92 samples, 22 (23.91%) were positive for IgM leptospirosis while 66 (71.74%) were negative and 4 (04.35%) samples (1.75%) were reported equivocal.
- IgM antibodies against Hepatitis A virus were found in 12 patients out of total 92 serum samples. Among these 12 IgM HAV positive samples, 07 samples were also IgM for leptospirosis positive while 04 samples were IgM for leptospirosis negative and 01 sample was equivocal for IgM leptospirosis.
- IgM antibodies against Hepatitis E virus were diagnosed in 02 patients and both these samples were negative for IgM leptospirosis.

Table 1: Total samples tested for IgM ELISA Leptospirosis

S.No:	IgM ELISA	Number	Percentage (%)
1.	Positive	22	23.91
2.	Negative	66	71.74
3.	Equivocal	04	04.35
Total		92	100

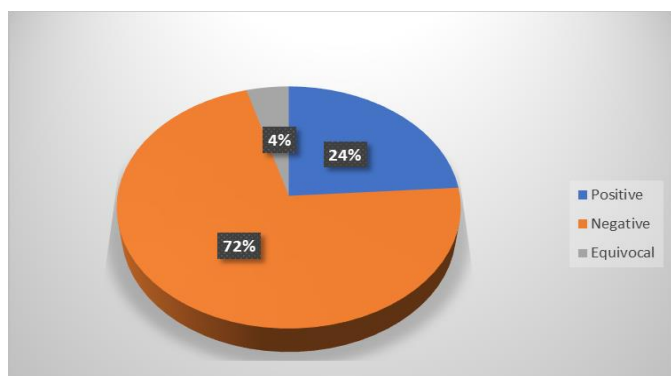


Fig 1 : Total samples tested for IgM ELISA Leptospirosis.

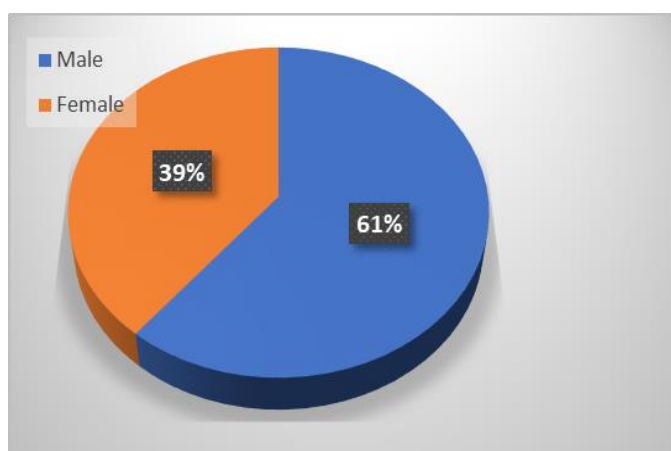


Fig 2 : Sex-wise distribution of samples tested for IgM ELISA for Leptospirosis

Table 2: Total samples tested for IgM ELISA for HAV

S.No:	IgM ELISA	Number	Percentage (%)
1.	Positive	12	13.04
2.	Negative	80	86.96
Total		92	100

Table 3: Total samples tested for IgM ELISA for HEV

S.No:	IgM ELISA	Number	Percentage (%)
1.	Positive	02	02.17
2.	Negative	90	97.83
Total		92	100

Table 4 : Co-infection of Leptospirosis, HAV and HEV

S.No:	IgM Leptospirosis	IgM HAV positive	IgM HEV positive
1.	Positive = 22	07	00
2.	Negative = 66	04	02
3.	Equivocal = 04	01	00
Total = 92		12	02

IV. DISCUSSION

- Acute febrile illness with jaundice is diagnostic challenge to the clinician because many infections like malaria, enteric fever, leptospirosis, dengue, viral hepatitis can present with these clinical features.
- Patients with abrupt onset of fever, chills, conjunctival suffusion, headache, myalgia and jaundice must be investigated for leptospirosis and viral hepatitis⁷.
- History of occupational/recreational/agricultural exposure to infected animals or to an environment potentially contaminated with animal urine⁷.
- Co-infection of leptospirosis and HAV could be due to exposure to water contaminated with both organisms.

V. CONCLUSION

- This study highlights the importance of timely diagnosis of leptospirosis, HAV and HEV co-infection which acts as synergistic factors for liver damage.
- It is imperative to look for leptospirosis and viral hepatitis (HAV/HEV) in appropriate settings if jaundice associated with fever especially in endemic areas.
- The health authorities must look for co-infections in tropical and sub-tropical areas along with relevant history of exposure.
- Awareness and optimal use of laboratory can overcome the dilemma associated with mixed infections in clinical practice.

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