INTERNATIONAL JOURNAL OF HEALTH & MEDICAL RESEARCH

ISSN(print): 2833-213X, ISSN(online): 2833-2148

Volume 04 Issue 03 March 2025

DOI : 10.58806/ijhmr.2025.v4i3n01

Page No. 120-123

Bacteriological Profile Isolated from Patients with Viral Hepatitis Diseases

Abdul-Hassan A. Hussien[1], Luma T. Ahmed[2]

[1]University of Diyala College of medicine Microbiology branch MDBSC

[2]University of Diyala College of medicine Microbiology branch Professor

ABSTRACT

Background: Three types of bacterial liver infections may be distinguished: granulomatous liver disease caused by bacteria, bacterial liver abscesses, and acute bacterial hepatitis. Numerous types of hepatic infections have been linked to a wide range of bacteria, and the liver is impacted by the infection process of numerous systemic bacterial diseases. Clinical manifestations, etiological agents, and treatment modalities substantially intersect. The majority of liver-damaging bacterial infections only manifest clinically and laboratory as secondary hepatitis.

Aims of the study: To show the bacterial profile in viral hepatitis patients as a preliminary investigation at Diyala province.

Methodology: Cross-sectional study Included (40) patients with clinically diagnosed viral hepatitis with in a period of 1st November 2023 to 30th March 2024. Those subjects were in patients at Baaquba Teaching Hospital in Diyala province, Blood and urine samples were collected from each subject.

Results: All blood and urine samples obtained from individuals with viral hepatitis yielded positive findings at percentage 26 (65%) when subjected to bacterial culture. Regarding blood culture, 19 cases were positive bacterial culture. The predominant bacterium of Gram positive was *Staphylococcus haemolyticus*, and for Gram-negative was *Pseudomonas aeroginosa*. bacterial cultures were detected in 26 cases for urine culture Also, *Staphylococcus haemolyticus* was the predominant Gram-positive bacterial type in urine samples of viral hepatitis patients and *E. coli* was the predominant type for Gram negative bacteria.

Conclusion: Bacterial infections were detected in viral hepatitis patients. Bacterial cultures were detected in 26 cases for urine culture Also, *Staphylococcus haemolyticus* was the predominant Gram-positive bacterial type in urine samples of viral hepatitis patients and *E. coli* was the predominant type for Gram negative bacteria.

INTRODUCTION

The inflammation of the liver is known as hepatitis. The illness may resolve on its own or may worsen and lead to liver cancer, cirrhosis, or fibrosis (scarring). Although hepatitis viruses are the most frequent cause of hepatitis worldwide, autoimmune disorders, alcohol, narcotics, and other toxic chemicals can also result in hepatitis. The five primary forms of hepatitis viruses are A, B, C, D, and E. (1)

The host's immune response to the hepatitis B virus (HBV) has a significant impact on the pathophysiology of the infection and each patient's unique clinical history. Unlike those infected with the hepatitis C virus (HCV), the majority of hepatitis B patients appear to recover from their viral infection. (2)

It has recently been shown that T lymphocytes reactive with hepatitis B core protein (HBc) mostly belong to the Th1 subset and produce interferon-gamma (IFN-γ) in individuals with self-limited acute hepatitis B. (3)

Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are still common in Iraq, a developing nation with a 2%–5% HBV carrier prevalence. Even though Iraq's Expanded Program on Immunization covers HBV immunization, less than 80% of people are receiving the shots. (4)

Infections with HBV and HCV acquired in hospitals still happen, even though medical professionals are becoming more aware of the issue. (5)

The three most prevalent infections among people with liver disease are urinary tract infections, bacteremia, and pneumonia. (6)

The hepatitis B virus does not have a cytopathic impact by itself. Some of the early symptoms of chronic hepatitis, such as arthralgias, arthritis, and urticaria, as well as some of its consequences, such as glomerulonephritis, cryoglobulinemia, and vasculitis, are brought on by antigen-antibody complexes. (7)

The primary target of the hepatitis C virus infection is hepatocytes; nevertheless, there is no proof that the virus has cytopathic effects on liver cells. Rather, the immunological onslaught by cytotoxic T cells is most likely what killed the hepatocytes. (8)

Bacteriological Profile Isolated from Patients with Viral Hepatitis Diseases

A potentially fatal disease known as liver failure arises when there is significant damage to the hepatocytes. Increasing host vulnerability to bacterial infections is one of the most common effects of liver failure. (9)

AIM OF THE STUDY

The aim of this study was shown the bacterial profile in viral hepatitis patients as a preliminary investigation at Diyala province.

METHODOLOGY

Subjective and patients

Cross-sectional study Included (40) patients with clinically diagnosed viral hepatitis with age ranged between (14-61) years old from both genders (23 males and 17 females) with in a period of 1st November 2023 to 30th March 2024. Those subjects were inpatients at Baaquba Teaching Hospital in Diyala province, Blood and urine samples were collected from each subject.

Bacterial Identification

The isolates were identified by vitek instrument according to the manufacture company (Biomerieux / Franch) identification using Vitek 2 System. A pure culture of the bacteria sample grown on nutrient agar plates at 37ºC for 24 h suspended in a sterile saline solution to a McFarland standard of 0.5-1.0. The sample is then loaded into the instrument, along with an identification card specific to the type of microorganism being identified. The instrument incubates the sample for a specified period, usually 2-12 hours, and then reads the results to provide an identification. In accordance with industry guidelines (Biomerieux), the VITEK 2 system evaluates the data obtained and uses colorimetric tests (biochemical reactions) to identify the tested bacteria (10).

Statistical analysis

Statistical analysis was performed using Statistical Package for Social Science Software (SPSS, version 22). Variables were described using frequency distribution and percentage for the subjects according to their characteristics and mean; standard deviation (SD) for continuous variable. Independent sample t-test was used. The p-value of < 0.05 was statistically significant.

Ethical approval

The necessary ethical approval from ethical committee in Merjan Teaching Hospital was obtained. Moreover, all subjects involved in this work were informed and the agreement required for doing the experiments and publication of this work was obtained from each one prior the collection of samples.

RESULTS

All blood and urine samples obtained from individuals with viral hepatitis yielded positive findings at percentage 26 (65%) when subjected to bacterial culture. Regarding blood culture, 19 cases were positive bacterial culture. The predominant bacterium of Gram positive was Staphylococcus haemolyticus, and for Gram-negative was Pseudomonas aeroginosa as shown in table 1.

Table (1): Distribution of Gram-positive and Gram- negative bacteria in blood isolates.

Bacterial isolates from blood	No. of isolates	Percentage
Staph. haemolyticus	1	5.3%
Kocuria kristinae	1	5.3%
Pseudomonas aeruginosa	16	84.2%
Pseudomonas luteala	1	5.3%

Table 2 show that bacterial cultures were detected in 26 cases for urine culture Also, *Staphylococcus haemolyticus* was the predominant Gram-positive bacterial type in urine samples of viral hepatitis patients and *E. coli* was the predominant type for Gram negative bacteria.

Table (2) Distribution of Gram-positive and Gram- negative bacteria in urine isolates.

Bacterial isolates from urine	No. of isolates	Percentage
Staph. Haemolyticus	8	30.8%
Staph. Epidermidis	1	3.8%
Staph. Epidermidis	2	7.7%
Rothiadentocariosa	1	3.8%
Lactobacillus spp.	2	7.7%
Escherichia coli	6	23.1%
Klebsiella Pneumoniae	3	11.5%
Proteus mirabilis	1	3.8%
Citrobacterfarmeri	1	3.8%
Enterobacter cloacae	1	3.8%

DISCUSSION

These findings corroborated those of byother *et al*. (10) who discovered that 64% of all samples from hospitalized patients were positive for bacterial growth, with half of those cases being dangerous. In the rare instances where there is a prognosis of subacute hepatic necrosis or fullminant hepatic failure, bacterial infection may account for as much as 20% of mortality. (11) Additionally, the findings of this investigation align with those reported by Campillo *et al.* (12), who reported that urinary tract infections, pneumonia, and blood stream infections were the causes of positive cultures for blood and urine samples in hepatitis patients. Patients with liver illness are most commonly infected with urinary tract infections, bacteremia, and pneumonia. When fever, rigors, hypotension, and leukocytosis—the typical clinical features of infection—are absent, it can sometimes be more difficult to diagnose an infection. (13) Even though broad spectrum antibiotics are used extensively, up to 25% of liver disease patients die from bacterial infections. It is challenging to determine from published studies if individuals with various forms of liver disease have bacterial infections. (13) Pseudomonas aeroginosa and Staphylococcus haemolyticus were the most common bacteria. The findings of this investigation corroborate those of Barros *et al*. (14), who noted that *S. haemolyticus* is a prominent Gram-positive bacterium that can be isolated from hospitalized patients and is linked to bacteremia in hepatitis patients. The Kocuria kristinae case, which involved bacteremia in hepatitis patients. Micrococcus infections are rare but recognized, particularly in individuals with underlying diseases who are immunocompromised. (15) Additionally, the current study's findings aligned with those presented by Kang *et al.* (6), who suggested that *P. aeroginosa* is the primary pathogen implicated in hepatitis patients' bloodstreams. These microorganisms are a significant pathogen linked to several diseases, particularly in those with impaired immune systems. Many different types of bacteria can cause urinary tract infections (UTIs). In both men and females, coagulase-negative staphylococci are the most prevalent organisms to colonize the urethra and periurethra, whereas E. coli is the most common etiological agent of UTI in hospital and community patients. (17)

CONCLUSION

Bacterial infections were detected in viral hepatitis patients. Bacterial infections were detected in viral hepatitis patients. Bacterial cultures were detected in 26 cases for urine culture Also, *Staphylococcus haemolyticus* was the predominant Gram-positive bacterial type in urine samples of viral hepatitis patients and *E. coli* was the predominant type for Gram negative bacteria.

REFERENCES

1) Arnold, F.; Sciortino, C.; Riede, K. (2004). New Associations with Pseudomonas Luteola Bacteremia: A Veteran with a History of Tick Bites anda Trauma Patient with Pneumonia. Int.J. Infec. Dis. 4: 2.
2) Penna, A.; Prete, G.; Cavalli, A. bertoletti, A.; D'Elios, M.; Sorrentino, R.; D'Amato, M.; Boni, C.; Pilli, M.; Fiaccadori, F.; and Ferrari, C. (1997). Predominant T-helper 1 Cytokine Profile of Hepatitis B Virus Nucleocapsid-Specific T Cells in Acute Selflimited Hepatitis B. Hepatology. 25:1022–7.
3) World Health Organization (WHO). (2008). Hepatitis B.
4) World Health Organization (WHO). (2009). Immunization Service Delivery. Hepatitis B. Countries Using Hepatitis B Vaccine.
5) Dumpis U et al., (2003). An Outbreak of HBV and HCV Infection in a Paediatric Oncology Ward: Epidemiological Investigations and Prevention of Further Spread. J. Med. Virol., 69:331–338.
6) Rimola, A.; Soto, R.; Bory, F.; Arroyo, V.; Piera, C.; Rodes, J. (1984). Reticuloendothelial System Phagocytic Activity in Cirrhosis and Its Relation to Bacterial Infections and Prognosis.Hepatology. 4: 53-8.
7) Levinson, W. (2014). Review of Medical Microbiology and Immunology 331-340.
8) Natravis, R.; Cox, M. M.; Smruti, R.; Mohanty, M. M. (2009). Acute Liver Failure.Residentgr and Rounds.7-15.
9) Levinson, W. (2014). Review of Medical Microbiology and Immunology 331-340.
10) Espinar, M. J.; Rocha, R.; Ribeiro, M.; Rodrigues, A. G.and Pina-Vaz, C. (2011). Extended-spectrum β-lactamases of Escherichia coli and Klebsiella pneumoniae screened by the VITEK 2 system. J Med Microbiol .60(Pt 6):756-760.
11) Sloth K.; Juhi, E.; Tygstrup, N. (2001). The Causes of Death in Prednisone Treated and Control Patients with Cirrhosis. Scand. J. Gastroenterol. 7:189- 93.
12) Powell- Jackson, P.; Melia, W.; Canalese, J.; Pickford, RB.; Portman, B. (1982). Clinical Patterns and Therapy.J.Med. 51: 79- 88.
13) Campillo, B.; Philippe, J.; Tuan, K. (2002). Nosocomial Spontaneous Bacterial Peritonitis and Bacteremia in Cirrhotic Patients: Impact of Isolate Type on Prognosis and Characteristics of Infection. Clinical Infections Disease. 35: 1-10.
14) Wyke, RJ. (2004). Studies of the Susceptibility to Bacterial Infection of Patients with Liver Disease. Med. Clin. 81: 53- 6.
15) Barros, E.; Ceotto, H.; Bastos, M.; Santos, K.; and Giambiagi-demarval, M. (2012). Staphylococcus haemolyticus as an Important Hospital Pathogen and Carrier of Methicillin Resistance Genes. J. Clin. Microbiol. 50:166-168.
16) Edmond, S.; Chris, L.; Kristi, T.; Edmond, C.; WC, Y.; and Angus, C. (2005). Kocuria kristinae Infection Associated with Acute Cholecystitis. BMC Infect. Dis. 5: 60.

17) Kang, C.; Kim, S.; Park, W.; Lee, K.; Kim, H.; Kim, E.; and Choe, K. (2005). Bloodstream Infections Caused by Antibiotic-Resistant Gram-Negative Bacilli: Risk Factors for Mortality and Impact of Inappropriate Initial Antimicrobial Therapy on Outcome. Antimicrob Agents Chemother. 49: 760–766.
18) Latham, R.; Running, K.; and Stamm, W. (1983). Urinary Tract Infections in Young Adult Women Caused by Staphylococcus saprophyticus. J. Am. Med. Assoc. 250:3063-3066.
19) Al-Sweih, N.; Jamal,W.; Rotimi, V. (2005). Spectrum and Antibiotic Resistance of Uropathogens Isolated from Hospital and Community Patients with Urinary Tract Infections in Two Large Hospitals in Kuwait. Med. Princ. Pract. 14: 401-407.