HDV INFECTION IN HBV INFECTED INDIVIDUALS

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ABSTRACT... Objective: To determine the status of HDV infection in HBV infected individuals at Larkana. **Duration & place of study:** This is a laboratory based retrospective study conducted at Molecular Laboratory HPCP-CMI Central laboratory CMC Hospital City block Larkana from October 2010 to September 2011. **Material & methods:** During the study period all the serum samples in which the HBV DNA was qualitatively detected werefurther processed for HDV RNA detection by the method of Real time PCR. **Result:** During the study period a total of 1564 HBV DNA detected serum samples were processed for HDV RNA detection. The males were 1078 (69.0%) and females 486 (31.0%). The age were ranged between 15 to 73 years. Out of the 1564 HBV DNA detected serum samples, the HDV RNA was detected in 865 (55.31%) and not detected in 699 (44.69%) individuals. **Conclusions:** This study showed 55.3% HDV infection in the HBV infected patient. Hence, to formulate the treatment option and to predict the response of treatment it is necessary that every HBV infected case should be processed for HDV RNA detection.

Key words: Hepatitis D, Delta virus, HDV RNA.

INTRODUCTION

The Hepatitis B virus (HBV) infection is the most common prevalent infection through out the world[1,2]. Specially in the developing countries, it is being considered as one of the most important public health problem, causing the millions of the deaths[3,4]. The hepatitis D virus (HDV) is a defective RNA virus[5-7]. It is dependent on HBV for its replication[8]. The HBV provides the viral coat with the surface antigen for its infection into the hepatocytes and assembly of virion[9,10]. The HDV can cause a co-infection in persons with HBV or a super infection in individuals, who are the chronic carries of HBV infection[11,12]. The persons having HBV / HDV co-infection may developed more serious acute illness and increased risk of fulminant hepatitis[13-15]. The HDV infection also results the increased rate of progression to cirrhosis of liver and hepatocellular carcinoma[16,17]. Though, the HDV infection is present through out the world and it can infect all age groups but its distribution is still in doubt and corresponds only to the prevalence of HBV infection[18]. Since last many years the prevalence of HDV infection has been changed in many geographical areas. The declining trend in many parts of world has been observed, which is due to the HBV vaccination[19-23]. Regarding the HDV infection a state of ignorance has been prevailed in our country due to the lack of actual figures of its epidemiology[24]. This study was carried out to determine the status of HDV in HBV infected patients at the central Laboratory Chandka Medical College Hospital larkana associated with Shaheed Mohtarma Benazir Bhutto Medical University (SMBBMU), Larkana.

MATERIAL AND METHODS

This is a laboratory based retrospective study, conducted at Molecular Laboratory HPCP-CMI, Central Laboratory Chandka Medical College, Hospital City Block Larkana. The study was conducted from the month of October 2010 to September 2011. During the study period all the HBV DNA positive serum samples were processed for the determination of the status of HDV infection. The identification of HBV & HDV in this study was carried out at molecular level by detecting the nucleic acid of the viruses. For nucleic acid detection of both the infectious agents, the molecular based methods such as Real time polymerase chain reaction have been used. After the

processing of all HBV DNA positive serum samples, those were consider as the HDV infected in which the HDV RNA was qualitatively detected and HDV negative, in which HDV RNA was not detected.

RESULTS

During the one year period of study, a total of 1564 HBV DNA positive samples were processed for HDV RNA detection. The males were 1078 (69%) and female 486 (31%). The age were ranged between 15-73 years. The HBV DNA positive cases were processed during all the months study year except January, February, March 2011 due to some unavoidable technical problems. Out of the 1564 HBV DNA positive serum samples, the HDV RNA was detected qualitatively in 865 (55.31%) and not detected in 699 (44.69%) serum samples. Out of the 865 HDV RNA positive cases, the males were 593 (68.56%) and females 272 (31.44%). The variation in detection rate of HDV RNA has been documented in the various months of the study period. Theminimum HDV RNA detection rate of 21.80% was documented in the month of April 2011 and maximum HDV detection RNA rate of 72.20% was detected in the months of September 2011 (Table-I).

Table-I. Moth wise detection of HDV RNA cases

Month	HBV DNA detection	HDV RNA detection	HDV RNA not detective
October 2010	92	56 (60.9%)	36 (39.1%)
November 2010	92	55 (59.8%)	37 (40.2%)
December 2010	276	119 (43.1%)	157 (56.9%)
January 2011	-	-	-
February 2011	-	-	-
March 2011	-	-	-
April 2011	276	60 (21.8%)	216 (78.2%)
May 2011	92	57 (62.0%)	35 (38.0%)
June 2011	92	63 (68.5%)	29 (31.5%)
July 2011	276	193 (69.9%)	83 (30.1%)
August 2011	184	129 (70.1%)	55 (29.9%)
September 2011	184	133 (72.2%)	51 (27.8%)
Total	1564	865 (55.3%)	699 (44.69%)

DISCUSSION

Since many years the world wide change in the epidemiology of HDV infection has been observed. On one hand over a period of decade its incidence in the traditionally prevalent areas of Europe has been decreased from 23% to 8.3%[25-27]. While on the other hand, some developing countries with increased prevalence of HBV infection and decreased preventive strategies including immunization against HBV have become immerged as the most prevalent areas for HDV infection[28]. In this regard, the reported studies of our country also showing the increasing frequency of HDV infection in HBV infected individuals. Mumtaz et al[28] in 2005 reported the 16.16% , DAS et al [29] in 2008 recorded 31.5% and Zaidi et al[30] in 2010 observed 88.8% HDV infection in HBV infected individuals.

The status of HDV infection in HBV infected patient documented in our study was 55.31% , which is in accordance with the study of seetlani et al,[31] who reported the overall 58.6% positivity of HDV infection in HBV infected individuals. The study of Khan et al[32] is also closely co-related with our study, who observed 67% prevalence of HDV infection in the province of Sindh, Pakistan. The another important aspect of our study is an observation that the HDV infection was more documented in males (68.56%), which is also in accordance with the studies of Seetlani et al,[31] and Khan et al[32] who also observed the higher frequency of HDV infection in male individuals, Which looks to be attributed to the high risk behavior of male population.

CONCLUSIONS

Our study showed high frequency of HDV infection in HBV infected individuals, that indicate the importance of further diagnosis HBV infected individuals for the HDV infection. As the males were more infected than females, hence the special attention should be given to the all related risk factors responsible for the spread of this double HBV and HDV infection.

RECOMMENDATIONS

To formulate the treatment option and to predict the response of treatment, it is recommended that every HBV infected case should be further processed for HDV RNA detection. It is also recommended that the proper HBV vaccination and awareness programs for the general public, Health practitioner and health care mangers should be started to make the people free from both HBV and HDV infections.

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REFERENCES

1. Zaki H, Darmstadt GL, Baten A, Ahsan CR, Saha SK. **Seroepidemiology of hepatitis B and delta virus infections in Bangladesh.** J Trop Pediatr.2003; 49(6):371-4.

2. World Health Organization. World Health Organization fact sheet No.204 Hepatitis B. Geneva: The Organization; 2002.

3. Gupta P, Biswas D, Shukla I, Bal A: **Need for Routine Screening of HBV and HDV in Patients with Cirrhosis of the Liver.** Ind J Med Microbiol 2005, 23:141-142.

4. Iqbal MZ, Azeem M, Malik MR. **Hepatitis 'B' and 'C'; prevalence inorthopaedics patients.** Professional Med J Mar 2011;18(1):69-7.

5. Wiwanitkit V. **Predicted binding affinity of candidate HDV epitope: abioinformatics study.** Ann Hepatol 2007; 6:108-10.

6. Koytak ES, Yurdaydin C, Glenn JS. **Hepatitis d.** Curr Treat Options Gastroenterol 2007;10:456-63.

7. Greeve J, Hartwig D, Windler E, Greten H. **Requirements for editing in thegenomic RNA of hepatitis delta virus.** Biochimie 1994; 76:1209-16.

8. Jacobson, I.M and J.L. Dienstag and B.G. werner et al, 1995. **Epidiomiology and clinical impact of hepatitis D virus (delta) infection.** Hepatology, 5:188-191.

9. Ryu WS, Bayer M, Taylor J. **Assembly of hepatitis delta virus particles.** J Virol1992;66:2310-5.

10. Shih HH, Jeng KS, Syu WJ, Huang YH, Su CW, Peng WL, et al. **Hepatitis Bsurface antigen levels and sequences of natural hepatitis B virus variantsinfluence the assembly and secretion of hepatitis d virus.** J Virol 2008;82:2250-64.

11. Fonseca JC. **[Hepatitis D]** Rev Soc Bras Med Trop 2002; 35:181-90.

12. Hsieh TH, Liu CJ, Chen DS, Chen PJ. **Natural course and treatment ofhepatitis D virus infection.** J Formos Med Assoc 2006; 105:869-81.

13. Monjardino JP, Saldanha JA. **Delta hepatitis. The disease and the virus.** BrMed Bull 1990;6:399-407.

14. Rizzetto M. **Hepatitis delta virus (HDV) infection and disease.** Ric Clin Lab1989; 19:11-26.

15. Castelnau C, Le Gal F, Ripault MP, Gordien E, Martinot-Peignoux M,Boyer N, et al. **Efficacy of peginterferon alpha-2b in chronic hepatitisdelta: relevance of quantitative RT-PCR for follow-up.** Hepatology 2006;44:728-35.

16. Rizzetto M, Verme G, Recchia S, Bonino F, Farci P, Arico S, et al. **Chronic hepatitis in carriers of hepatitis B surface antigen, withintrahepatic expression of the delta antigen. An active and progressive disease unresponsive to immuno-suppressive treatment.** Ann Intern Med 1983;98: 437-41.

17. Saracco G, Rosina F, Brunetto MR, Amoroso P, Caredda F, Farci P, et al, **Rapidly progressive HBsAg positive hepatitis in Italy. The role ofhepatitis delta virus infection.** J Hepatol 1987;5: 274-81.

18. World Health Organization. **Department of Communicable Disease Surveillanceand Response.** Hepatitis Delta. http://www.who.int/csr/disease /hepatitis/HepatitisD_whocdscsrncs2001_1.pdf.

19. Deertekin H, Yalçin K, Yakut M: **The prevalence of hepatitis delta virus infection in acute and chronic liver diseases in Turkey: an analysis of clinical studies.** Turk J Gastroenterol 2006, 17:25-34.

20. Chakraborty P, Kailash U, Jain A, Goyal R, Gupta RK, Das BC: **Seroprevalence of hepatitis D virus in patients with hepatitis B virus-related liver diseases.** Indian J Med Res 2005,122:254-7.

21. Gaeta GB, Stroffolini T, Chiaramonte M, Ascione T, Stornaiuolo G,Lobello S, et al. **Chronic hepatitis D: a vanishing disease?** An Italianmulticenter study.Hepatology 2000;32:824-7.

22. Huo TI, Wu JC, Lin RY, Sheng WY, Chang FY, Lee SD. **Decreasing hepatitis D virus infection in Taiwan: an analysis of contributory factors.** J Gastroenterol Hepatol 1997;12:747-51.

23. Abbas Z, Jafri W, Raza S. **Hepatitis D: Scenario in the Asia-Pacific region.** World J Gastroenterol2010 February 7;16(5):554-562.

24. Zuberi BF, Quraishy MS, Afsar S, Kazi LAG, Memon AR et al. **Frequency and comparative analysis of hepatitis D in patients seeking treatment for hepatitis B.** JCPSP 2006, Vol.16 (9): 581-584.

25. Smedile A, Lavarini C, Farci P, Arico S, Marinucci G, Dentico P,et al. **Epidemiologic patterns of infection with the hepatitis Bvirus-associated delta agent in Italy.** Am J Epidemiol 1983;117:223–9.

26. Navascues CA, Rodriguez M, Sotorrio NG, Sala P, Linares A, Suarez A,et al. **Epidemiology of hepatitis D virus infection: changes in the last 14years.** Am J Gastroenterol 1995;90:1981-4.

27. Sagnelli E, Stroffolini T, Ascione A, Chiaramonte M, Craxi A, Giusti G,et al. **Decrease in HDV endemicity in Italy.** J Hepatol 1997; 26:20-4.

28. Mumtaz K, Hamid SS, Adil S, Afaq A, Islam M, Abid S: **Epidemiology andclinical pattern of hepatitis delta virus infection in Pakistan.** JGastroenterolHepatol 2005, 20:1503-7.

29. Das K, Ali H, Mahmood T, Munir SM, Ahmed T, Farooq MU. **Comparative analysis of disease activity in patients of chronic hepatitis B virus, with and without super infection with hepatitis D virus; an experience at tertiary care centre.** J Ayub Med Coll Abbottabad 2008;20(2): 39-42.

30. Zadi G, Idress M, Malik FA, Amin I, Shahid M et al. **Prevalence of hepatitis delta virus infection among hepatitis B virus surface antigen positive patients circulating in the largest province of Pakistan.** Virology Journal 2010,7:283.

31. Seetlani NK, Abbas Z, Raza S, Yakoob J, Jafri W: **Prevalence of Hepatitis Din HbsAg positive patients visiting liver clinics.** JPMA 2009, 59:434.

32. Khan AU, Waqar M, Akram M, Zaib M, Wasim M et al. **True prevalence of twin HDV-HBV infection in Pakistan: a molecular approach.** Virology Journal 2011, 8:420.

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"Friends may come and go,
but enemies accumulate."

Charles de Gaulle (1890-1970)