

## THE PREVALENCE STUDY OF HEPATITIS D AMONG HBSAG POSITIVE SUBJECTS

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### Abstract

Serological markers of Delta virus in relation to hepatitis B virus (HBV) infection were studied from January 2002 to December 2003 in 280 patient's sera in comparison with 2500 health blood donors and with HBsAg positive patients with or without hepatitis D virus (HDV) infection in Al-Qadisiya Governorate. Enzyme Linked Immunosorbent Assay (ELISA) was used for the determination of serological markers. The Seroprevalence study showed that apparently healthy blood donors may have HDV and that various potential risk factors for the transmission of HBV enhance HDV transmission in Al-Qadisiya, apparently health HBsAg positive blood donors showed a relatively lower HDV rate (0.96%) when compared to HBsAg positive (1.32%), when the prevalence of HDV in patients was 10.7%(30/280) and HBsAg positive was 12.5%(36/280).

### Introduction

The hepatitis D virus (also called delta virus) is a small circular RNA virus (Rizzetto, M; Canses, 1977). The hepatitis D virus is replication defective and therefore cannot propagate in the absence of another. In humans, hepatitis D virus infection only occurs in the presence of hepatitis B infection (Caredda, 1985; Farci, 2003). Hepatitis D virus (HDV) is defective virus that requires the helper function of the hepatitis B virus (HBV) Bozdayi 2002). HDV develops only in patients with hepatitis surface antigen (HBsAg) (Buti, 1986). The diagnosis of HDV is made on the basis of serological tests to detect both the HDV only encoded antigen (HDAg) as well as specific antibodies against HDAg (anti - HD) of both IgG and IgM classes which can be done by enzyme- Linked Immunosorbent assay (ELISA) (Al-salami, 1987; Farci, 1986; Purcell 1989). Seroprevalence studies of anti - HD in HBsAg positive individuals have shown a worldwide no uniform distribution (Buti, 1986). Five percent or more of 300 million HBV cases worldwide are infected with HDV as well, due to the fact that HDV depends on HBV (Dimitrakakis, 2001). The epidemiology's of the two agents are generally parallel, but with important regional variations (Alter, 2002). The present study was either planned or designed to delineate the prevalence rate of HDV markers among HBsAg positive blood donors and HBsAg hepatopathies (Dimitrakakis, 2001; Farci 2003). Also one of the aims of this study was to assess the risk factors associated with the presence of HDV markers in comparison with those associated with HBV infection alone (Marcus, 1989; Mohammed, 1996)

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## Subjects

A total of 2780 blood samples were collected from January 2002 to December 2003. These included HBsAg positive sera obtained from voluntary blood donor to in the Central Blood Bank in Al-Qadisiya Governorate sera were obtained from donors aged ( 15 – 50 ) years old , while sera obtained from individuals attending the virology department at Al-Qadisiya Governorate were with an age range of ( 5 – 70 ) years. A questionnaire was used to record information from HBsAg positive patients who were found to have HDV markers.

## Methods

Any individual to be enrolled in this study should be reactive to HBsAg tested by ELISA for HBsAg a direct immunoenzymatic method of the "Sandwich" type in kits of Bioelisa HBsAg of Biokit, Spain. The confirmed HBsAg positive specimens were kept at - 30 C until the time of processing.

HBsAg positive serum sample from 280 patients from the Diwaniya Teaching Hospital and 2500 health voluntary blood donors to the Laboratory Department Blood Bank in Al-Qadisiya Governorate were tested for makers of Delta virus infection : delta antigen ( HDAg ) , antibodies to delta antigen ( anti - HD IgM and anti - HD IgG ) .

In this study used HDV Ag ELISA component Enzyme immunoassay kits (International Immune-Diagnostics, USA) for the detection HD Ag. Hepatostike HDV micrelisa system for the detection of antibody to hepatitis delta antigen (anti - IID) and / or hepatitis delta antigen (HDAg) in human serum (Oregano Teknika, Belgium). Bioelisa (ELISA) test for the detection of IgM antibodies to HDV in human serum.

## Statistical Analysis

Analysis of the data obtained was made by the use of a computer using the SPSS statistical package. By simple frequency distribution table , each variable in the present study had been classified .Regarding quantitative data , the test of significance used was the Chi - square (  $\chi^2$  ) test and the limit of the p-value accepted was  $< 0.05$  .

## Results

The prevalence of HDV markers among patient sera from Diwaniya Teaching Hospital was higher than that of blood donors 10.7 % ( 30/ 280); this is illustrated in Table (1). The prevalence of HBsAg was 12.5% (36/280); obtained from Diwaniya Teaching Hospital, this is illustrated in Table (2). Distribution of HDV markers varied between the two different HBsAg positive groups studied. The most prevalent marker in healthy blood donor was HDAg 0.96% (24/2500) while HBV marker prevalence was 1.3 (33/2500) among healthy blood donor HBsAg positive patients obtained from Diwaniya Teaching Hospital.

Table- 1 the prevalence of IIDAg among patients who were infected with liver disease according to age and sex in Al-Qadisiya Governorate.

Age group year	Males			Females			Total		
	No. Tested	IIDAg		No. Tested	IIDAg		No. Tested	IIDAg	
		N0	%		No	%		N o.	%
5-10	5	0	0	5	0	0	10	0	0
11-20	50	5	10	15	1	6.6	65	6	9.2
21-30	60	6	10	20	2	10	80	8	10
31-40	55	7	12.7	25	2	10	80	9	11.25
>50	30	5	16.6	15	2	20	45	8	17.8
Total	200	23	11.5	80	7	8.75	280	30	10.7

Table -2 the prevalence of HBsAg among patients who were infected with liver disease according to age and sex in Al-Qadisiya Governorate.

Age group year	Males			Females			Total		
	No. Tested	HBsAg		No. Tested	HBsAg		No. Tested	HBsAg	
		N0.	%		No.	%		No.	%
5-10	5	0	0	5	0	0	10	0	0
11-20	50	4	8	15	1	6.6	65	5	7.7
21-30	60	8	13	20	2	10	80	10	12.5
31-40	55	8	14	25	4	16	80	12	15
>50	30	6	20	15	3	20	45	9	20
Total	200	26	13	80	10	12.5	280	36	12.5

The positivity rate of HDV markers tended to increase with age up to 50 years. In adaptation table (2) shows that chronicity rate was found to increase with age. Tables (1, 2) show that there was predominance of males or females among the different HBsAg positive groups who were investigated for IIDV markers in my study. Moreover IIDV prevalence was found to be variable between males vs. females among the different HBsAg positive groups (11.5 vs. 8.75 %), (1.35 vs.1 %) in Diwaniya Teaching Hospital and Central Blood Bank in Al-Qadisiya Governorate respectively statistical analysis revealed that there were no significant difference between males and females in studied HBsAg positive groups.

Table- 3 the prevalence of HDAg among healthy blood donor according to age and sex in Al-Qadisiya Governorate.

Age group year	Males			Females			Total		
	No. Tested	HDAG		No. Tested	HDAG		No. Tested	HDAG	
		No.	%		No.	%		No.	%
15-20	267	2	0.37	22	0	0	289	2	0.7
21-30	1130	10	0.79	137	1	0.72	1267	11	0.86
31-40	693	8	1.1	32	0	0	725	8	1.1
>50	210	3	1.4	9	0	0	219	3	1.3
Total	2300	23	1	200	1	0.5	2500	24	0.96

Table -4 the prevalence of HBsAg among healthy blood donor according to age and sex in Al-Qadisiya Governorate.

Age group year	Males			Females			Total		
	No. Tested	HBsAg		No. Tested	HBsAg		No. Tested	HBsAg	
		No.	%		No.	%		No.	%
15-20	267	2	0.75	22	0	0	289	0	0
21-30	1130	11	0.97	137	1	0.7	1267	5	7.7
31-40	693	11	1.59	32	1	3.1	725	10	12.5
>50	210	7	3.3	9	0	0	219	12	15
Total	2300	31	1.35	200	2	1	2500	33	1.32

Comparison between HBV with and without delta infection according to history of exposure to some risk factors. The study showed that there was no illustrated in significant difference in risk factors between HDV infection and those among HBV infected people, however, frequent paraenteral drug administration risk factor was significantly higher in HBV with delta infection than those without.

### Discussion

The prevalence is not simply a function of the prevalence of HBV, but HDV has an epidemiology of its own. Apparently healthy blood donors showed a relatively lower HDV rate (0, 96 %) than the HBsAg positive hepatopathies (1.32 %) when the prevalence of HDV in patients was 10.7 % (30/280) and 12.5 % (36/280) the age prevalence of HDV parallels that of HBV. Although it has been reported in an Al-Qadisiya Governorate. The study that anti-HDV was found 10.7% of HBsAg carriers among hospital personnel (Mohammed, 1987). However when studying anti - delta in Iraqi blood donors by (Daher, 1985); Al - Salami, 1987; Rassam, 1988 and Mohammed, 1996), they found a prevalence of 5.5%, 8.9%,

- histological features of delta infection in chronic hepatitis B virus carriers. *J. Clin.pathol.*; 38:530-533.
14. Marcus, S. (1989): Virological and immunological studies in-disease's thesis submitted to the College of Medicine, Baghdad University.
  15. McCrudden, E.; and Follett, E. (1988): Delta virus co infection with acute hepatitis B in the West Scotland, 1985-86. In: Zuckerman, A. (Ed.). *Viral Hepatitis and Liver Disease*, Alan R. Less Inc.; New York, pp.427-429
  16. Mohammed, D. (1996): Current situation and plan of prevention. Conference of viral hepatitis, Baghdad, 14<sup>th</sup> may. Cited by Hassan, A. M., A seroepidemiological survey on HBsAg and anti-HCV in Babylon Governorate. M.Sc. Thesis submitted to College of Science, University of Babylon.
  17. Mohammed, H. (1987): prevalence of hepatitis B and delta viral infection among hospital in Mosul. M.Sc. Thesis, College of Science, University of Mosul.
  18. Ockner, R. (1996): Acute viral hepatitis. In Bennett, J. and Plum, F. (Eds.). *Cecil textbook of Medicine*. 20<sup>th</sup> ed., W.B. Saunders Company. (Vol. 1), pp.762-772.
  19. Ponzetta a, Forzani E, Shafi SM: Delta agent infection in Saudi Arabia: a general populat New York, NY: Grune and Stratton; 1984:634.
  20. Purcell, R. Hand Gerin, J.L. (1996): Hepatitis Delta virus. In B. M. Knipe; P.M. Hawley; et al. (Eds.). *Field's Virology*. 3<sup>rd</sup> ed., Lippincott-Raven Publishers, Philadelphia, pp. 2819-2829.
  21. Purcell, R. H.; Hoofnagle, J. H.; Ticehurst, J.; and Gerin, J. L. (1989): Viral hepatitis. In: Schmidt, N. and Emmons, R. W. (Eds.). *Diagnostic procedures for viral, rickettsial*
  22. Rassam, S. W.; Omer, A. R.; and Nazis, M.M. (1988): Delta virus infection in asymptomatic HBV carriers and in-patients with chronic liver disease in Iraq. In: Zuckerman, A.J. (Ed.) *Viral Hepatitis and Liver Disease*, Alan R. Less Inc.; New York, pp. 421-424.
  23. Rizzetto, M, M Macanese MG, Arico S: Immunofluorescence detection of new antigen-antibody associated to hepatitis B virus in liver and in serum of HBsAg carriers. *Gut* 1977 Dec ; 18 present status's Hepatology
  24. Rassam, S. W.; Omer, A.R.; and Niazi, M.M. (1988): Delta virus infection in asymptomatic carriers and in-patients with chronic liver disease in Iraq.
  25. Sagnelli, E.; Stroffolini, T.; Ascione, A.; and et al. (1992): The epidemiology of hepatitis delta infection in Italy. *Promoting Group.J.Hepatol.* 15(1-2):211-5.
  26. Smedil a, Casey JL cotes PJ, et al: hepatitis D, viremia following orthotropic liver transp. HDV virion with an HBsAg, 1998.
  27. Soubiran, G.; Le-Bras, M.; Marini, P; et al. (Africans living on the campus of the University of Niger. *Trans. R. Soc. Trop. Med* 1987): High HBsAg and anti-delta carrier's rate among asymptomatic. *Hyg.* 81 (6):998-1000.