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# Presence of acute hepatitis D infection in HBsAg positive cancer patients: A preliminary study from west Gujarat

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*Background & objectives*: Hepatitis delta virus (HDV) and hepatitis B virus (HBV) co-infection is well known to induce a spectrum of acute and chronic liver diseases. There has been global decline in the prevalence of hepatitis D infection. The aim of the present study was to know the presence of acute HDV infection among hepatitis B surface antigen (HBsAg) positive cancer patients.

*Methods*: A total of 5043 samples were subjected for routine testing of HBV, HIV and HCV by ELISA method. Further, 150 HbsAg positive samples were tested for HDV IgM detection by ELISA method.

*Results*: Of the 5043 blood samples tested in the laboratory, 150 (2.97%) were positive for HBsAg. HDV IgM was negative in all HbsAg positive samples.

*Interpretation & conclusions*: Acute infection by HDV (IgM detection) was not present in HBsAg positive cancer patients. Further studies on a large number of patients in different regions are required to confirm our preliminary findings.

Key words Hepatitis B virus - hepatitis D virus - hepatocellular carcinoma - seroprevalence

Hepatitis delta virus (HDV) and hepatitis B virus (HBV) co-infection induces a spectrum of acute and chronic liver diseases which further advance to cirrhosis, fulminant hepatitis and hepatocellular carcinoma (HCC). Prevalence of HDV differs widely from 0 to 19 per cent depending on two major factors: the target population and the geographic area evaluated<sup>1</sup>. HDV infections occur epidemically or endemically in countries where hepatitis B is endemic. A decline in the prevalence of hepatitis D infection has been noted world wide. India shows low prevalence and also decreasing trend towards HDV infection<sup>2</sup>.

The particle size of HDV is about 36 nm<sup>3</sup>. The HDV genome is a circular, negative sense, singlestrand RNA, which is approximately 1700 nucleotide in length<sup>4</sup>. HDV is a delta agent that is deformed and incomplete RNA virus whose replication and expression are dependent on the presence of hepatitis B surface antigen (HbsAg)<sup>3,4</sup>. HDV is considered to be a sub-viral satellite because it can propagate only in the presence of HBV. The dual infection of HBV and HDV may be either co-infection or super infection. In association with HBV, HDV produces significantly more severe illness than HBV alone<sup>4</sup>. It is observed that most of the individuals infected with HDV develop chronic form of the disease and in approximately 80 per cent of these individuals, chronic hepatitis D infection progresses to cirrhosis within 5-10 years<sup>5</sup>.

No information available on the characteristics and impact of HDV on HBsAg positive cancer patients from Gujarat. Therefore, the aim of the present study was to know the presence of acute HDV infection among HBsAg positive cancer patients.

## Material & Methods

This study was carried out in the Microbiology laboratory of the Gujarat Cancer and Research Institute, Ahmedabad, India, from Feburary to April 2013. A total of 5043 blood samples from the cancer patients received for serological testing of HBsAg, HIV and hepatitis C virus (HCV) from different units of hospitals were included in the study. Demographic data were recorded, and history of blood transfusion was also noted. The study was approved by the Institute Review and Ethics Board.

Samples were tested for HBsAg by ELISA method (Hepanostika HBsAg, bioMerieux SA, France). Blood samples which were HbsAg positive (n=150) were tested for the detection of HDV IgM by capture ELISA method using DSI SRL kit supplied by Diapro, Italy. All samples were tested on fully automated ELISA system (Dynex, DAVINCI QUATTRO, Germany).

## **Results & Discussion**

Of the 5043 blood samples tested, 150 (2.97%) were positive for HBsAg, 32 (0.63%) were positive for HIV and 22 (0.43%) were HCV positive. Of the 150 HBsAg positive patients, 102 (68%) were males and 48 (32%) females; 90 (60%) were located in rural area, and 60 (40%) from urban area; and 105 (70%) patients had taken blood transfusion. Forty five (30%) patients were suffering from hepato cellular carcinoma (HCC), followed by leukaemia (35, 23%), head and neck cancer (23, 15.33%), solid tumours (17, 11.33%), lymphoma (12, 8%), carcinoma of ovary (10, 6.66%), carcinoma of cervix (8, 5.33%). All 150 patients were negative for HDV IgM.

It is seen that coexistent infection with hepatitis B aggravates the course of liver diseases. Though HBsAg was positive in different disease groups like HCC, leukaemia, lymphoma, head and neck cancers, solid tumours, lymphoma, carcinoma of ovary and cervix, the detection of HDV IgM was absolutely nil.

Our study focused on detection of IgM HDV antibodies in cancer patients to detect acute infection. Most other studies detected HDV IgG antibodies.

Mulla and Shah<sup>6</sup> from west Gujarat, showed 8.5 per cent prevalence of HDV amongst HBsAg positive patients. In a study from north India<sup>7</sup> of the 40 cirrohosis patients tested, 10 per cent were reactive for anti-delta antibodies. A study conducted in Pakistan<sup>8</sup> showed a high prevalence (28%) in HbsAg positive patients with chronic liver diseases. The incidence of HDV in the Italian population was estimated by a specific surveillance system for acute viral hepatitis over the period 1987-1992 in a multi-centre Italian study. The HDV incidence rate declined from 3.1/1,000,000 inhabitant in 1987 to 1.2/1,000,000 in 1992. The authors estimated that from 1987 to 1992, the rate of decrease in the proportion of HBsAg carriers with anti-HDV was about 1.5 per cent per year<sup>9</sup>.

A similar decrease (from 15.1% in 1983 to 7.1% in 1992) has also been reported from Spain<sup>10</sup>. From Taiwan, Huo *et al*<sup>11</sup>, have reported a decrease in HDV endemicity from 23.7 per cent in 1983 to 4.2 per cent in 1995.

In conclusion, acute HDV infection was not present in HBsAg positive cancer patients in our study.

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# Conflicts of Interest: None.

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