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Original Research Paper

Clinical Microbiology

"PREVALENCE OF HIV, HEPATITIS B AND C IN ONCOLOGY PATIENTS."

Dr. Vijeta Bajpai*	MD, DNB Microbiology Associate Professor, Department Of Microbiology, Homi Bhabha Cancer Hospital & Mahamana Pandit Madan Mohan Malviya Cancer Centre Varanasi, Uttar Pradesh Unit Of Tata Memorial Centre, Mumbai *Corresponding Author
Dr. Ankita Chaurasia	MD, DNB Microbiology Assistant Professor Department Of Microbiology, Homi Bhabha Cancer Hospital & Mahamana Pandit Madan Mohan Malviya Cancer Centre, Varanasi , Uttar Pradesh Unit Of Tata Memorial Centre, Mumbai
Dr. Anwita Mishra	MD, DNB Microbiology Assistant Professor, Department Of Microbiology Homi Bhabha Cancer Hospital & Mahamana Pandit Madan Mohan Malviya Cancer Centre, Varanasi, Uttar Pradesh Unit Of Tata Memorial Centre, Mumbai
Dr. Rahul Sarode	MD, DNB Microbiology Associate Professor, Department Of Microbiology, Homi Bhabha Cancer Hospital& Mahamana Pandit Madan Mohan Malviya Cancer Centre, Varanasi, Uttar Pradesh Unit Of Tata Memorial Centre, Mumbai
Dr. Sujit Bharti	MD, DNB Microbiology Associate Professor, Department Of Microbiology, Homi Bhabha Cancer Hospital & Mahamana Pandit Madan Mohan Malviya Cancer Centre, Varanasi , Uttar Pradesh Unit Of Tata Memorial Centre, Mumbai

ABSTRACT

Background: India has the third largest HIV epidemic in the world. India is classified as an intermediate in the Hepatitis B Virus (HBV) endemic (HBsAg carriage 2-7%) zone with the second largest global pool of chronic HBV infections. Understanding the prevalence of HIV, Hepatitis B, and Hepatitis C in oncology patients is crucial for developing comprehensive care plans that address the unique challenges posed by these infections. **Materials & Methods:** This retrospective study was conducted in the Department of Microbiology of a tertiary care centre. All registered patients whose blood sample which were sent to microbiology laboratory for viral markers i.e. HBsAg, anti-HCV and anti-HIV were included in the study. 3-5ml of blood sample were collected in plain vacutainer. All samples are processed after successful completion of calibration and quality control in VITROS ECiQ immunodiagnostic system. **Results:** Out of total 16341 oncology patients 366 (2.24%), 275 (1.68%) and 59 (0.36%) were Hepatitis B, Hepatitis C and HIV reactive respectively. Prevalence of infection was highest in patients with carcinoma oropharynx, .leukaemia followed by carcinoma cervix and breast. **Conclusion:** Understanding the prevalence of HIV, Hepatitis B, and Hepatitis C in oncology patients is crucial for developing comprehensive care plans that address the unique challenges posed by these infections. Ongoing research and region-specific data collection are essential to tailor prevention, screening, and treatment strategies effectively.

KEYWORDS :

INTRODUCTION

India has the third largest HIV epidemic in the world. India is classified as an intermediate in the Hepatitis B Virus (HBV) endemic (HBsAg carriage 2-7%) zone with the second largest global pool of chronic HBV infections (1). Viral hepatitis due to hepatitis B and C is a global public health problem affecting millions of people worldwide, causing an estimated 1.3 million deaths each year from acute infection and hepatitis-related liver cancer and cirrhosis (2). Chronic hepatitis B virus (HBV) infection is a major global cause of hepatocellular carcinoma (HCC). Individuals who are chronic carriers have a greater than 100-fold increased relative risk of developing the tumour (3). Oncology patients receiving packed red blood cell suspensions and other blood products usually are in the high-risk group for infections due to these viruses (4). Hepatitis B virus (HBV) and hepatitis C virus (HCV) coinfection is a complex clinical entity that has an estimated worldwide prevalence of 1–15%. Most clinical studies have shown that progression of disease is faster in HBV-HCV coinfected patients compared to those with coinfection (5). The main objective of this study is to determine the hepatitis B surface antigen (HBsAg), anti-HCV antibody (anti-HCV) and anti-HIV antibody (anti-HIV) seroprevalences in oncology patients.

MATERIAL AND METHODS

This retrospective study was conducted in the Department of Microbiology of a tertiary care centre.

Inclusion Criteria:

1. Cancer patients coming to emergency and in-patient department.
2. All samples which are received in microbiology laboratory for viral marker serological testing.

Exclusion Criteria:

1. Pregnant females and paediatric patients will be excluded
2. Nursing women, mentally challenged/mentally differently abled group, participants with reduced autonomy, mental illness or any other vulnerable group.

Methodology:

A total of 16000 patients were included in the study. All registered patients whose blood sample which were sent to microbiology laboratory for viral markers i.e. HBsAg, anti-HCV and anti-HIV were included in the study. 3-5ml of blood sample were collected in plain vacutainer. All samples are processed after successful completion of calibration and

quality control in VITROS ECiQ immunodiagnostic system. Vitros ECiQ Immunodiagnostic System performs immunodiagnostic assays on human serum samples. The system uses chemiluminescence detection technology to provide accurate and reliable results for heterogenous assays. All reactions for a single quantitative, semi-quantitative, and qualitative measurement take place within a coated well. Patients clinical and demographic details were recorded by Hospital EMR system.

Specimen collection

Specimen collection was done by phlebotomist. 4ml whole blood sample was collected in one plain vacutainer for all three viral markers.

Sample Processing

The patient identification over requisition form and sample vacutainer are verified and then specimen is processed. Centrifuge blood sample at 4000 rpm for 10 min. Place container containing specimen in universal sample tray. Now all further steps of processing in VITROS ECiQ were performed automatically by the machine. Results are calculated automatically by the VITROS ECiQ Immunodiagnostic system. Any sample found borderline or reactive in the VITROS were retested in duplicate to verify its status. For HIV antibodies after duplicate testing , sample is also tested by HIV tri-dot and Retroscreen for HIV antibodies.

RESULTS

Out of total 16341 oncology patients 366 (2.24%), 275 (1.68%) and 59 (0.36%) were Hepatitis B , Hepatitis C and HIV reactive respectively as shown in Table 1. Also 4 (0.02%) and 25 (0.15%) showed borderline result for Hepatitis B and C. Two were indeterminate for HIV.

In all 3 viral infections HBV, HCV and HIV reactivity was higher in males 66.12%, 52.73% and 57.63% respectively as compared to females.

Hepatitis B infection was maximum seen in leukaemia (15.85%) followed by carcinoma oropharynx (14.75%) patients as shown in Table 2.

In hepatitis C and HIV infection was maximum seen in carcinoma oropharynx patients 16.23% and 32.2% respectively.

Statistic analysis

Continuous and non-parametric will be analysed. All variables will be compared and correlation by calculating their odd ratio and CI interval by using SPSS software system number 21.

DISCUSSION

In this retrospective study patients with newly diagnosed cancer in North India, we observed 2.24% Hepatitis B, 1.68% Hepatitis C and 0.36% HIV infection in oncology patients. However as per Ramsey et al prevalence of hepatitis B was 6.5%, Hepatitis C 2.4% and HIV 1.1% (6). Prevalence of infection was highest in patients with carcinoma oropharynx, .leukaemia followed by carcinoma cervix and breast.

As per El-serag et al. prevalence of HBsAg in HCC patients varies from 3%-70% in different regions of world (7). In our study prevalence of HBsAg 12.03% which is concordant with El-serag et al. Table 3 shows prevalence of Hepatitis and HIV in different studies among oncology patients.

Serology testing is important in newly diagnosed cancer patients. Treatment of various cancers causes immuno suppression which may increases the risk of HBV reactivation (8). Also HBV reactivation may require modification in cancer treatment which may lead to less effective treatment (9). HB surface antigen (HBsAg) seroprevalence among persons with HCC varies widely: it is 3% in Sweden, 10% in the United States, 10%–15% in Japan, 19% in Italy, 55% in Greece, and 70% in South Korea.

HCV screening in cancer patients is important as HCV infection requires liver function tests monitoring during chemotherapy (10). Treatment of HCV infection in patients with NHL and other B cell lymphoproliferative disorders can sometimes leads to remission of cancer (11). As per Robert el al (12) Kaposi sarcoma is most common cancer in HIV infected patients, however in our study HIV prevalence was most common in patients with carcinoma of oropharynx. HIV associated cancers are increasing and these cancers.

CONCLUSION

Blood borne viruses play major role in the cancer risk profile. Diagnosis and treatment of these infections are one of the major causes of chronic liver disease. Understanding the prevalence of HIV, Hepatitis B, and Hepatitis C in oncology patients is crucial for developing comprehensive care plans that address the unique challenges posed by these infections. Ongoing research and region-specific data collection are essential to tailor prevention, screening, and treatment strategies effectively.

Table 1. Prevalence of Hepatitis B, C and HIV in Oncology patients.

n=16341	HBsAg	HCV Ab	HIV Ab
Reactive	366 (2.24%)	275(1.68%)	59(0.36%)
Non-Reactive	15971 (97.74%)	16041 (98.16%)	16280 (99.63%)
Borderline/Indeterminate	4 (0.02%)	25 (0.15%)	2 (0.01%)

Table 2. Demographic Profile of Reactive Oncology patients

Variables	HBsAg (n=366)	HCV Ab(n=275)	HIV Ab(n=59)
Age Mean ±SD	53±14	55±14	46±11
Male %	66.12	52.73	57.63
Female %	33.88	47.27	42.37
Aetiology %			
Breast Carcinoma	8.47	9.09	3.39
Carcinoma Cervix	4.10	10.91	11.86
Carcinoma Ovary	1.09	3.64	-
Carcinoma endometrium	0.27	0.36	5.08
Carcinoma Oropharynx	14.75	16.73	32.20
Leukaemia	15.85	5.82	10.17
Carcinoma colon	1.91	2.55	-
Hepatocellular Carcinoma	12.02	11.64	3.39
Carcinoma Gall bladder	4.64	11.27	6.78
Carcinoma Rectum	1.64	2.18	3.39
Carcinoma oesophagus	0.55	2.55	-
Carcinoma lung	3.01	3.27	-
Carcinoma Prostate	1.09	1.09	-
Renal Cell Carcinoma	2.46	0.00	-
Multiple Myeloma	5.74	2.55	1.69
CA Stomach	0.82	3.64	-
Hodgkin's Lymphoma	2.46	1.09	3.39
Carcinoma Bladder	-	2.18	5.08
Carcinoma of Bone Soft Tissue	-	1.09	1.69
Rhabdosarcoma	-	0.36	-
Carcinoma Larynx	-	1.82	-
Carcinoma Thyroid	-	0.36	-
Carcinoma Pancreas	-	1.09	6.78
Carcinoma Parotid	-	0.36	-
Carcinoma Penis	-	0.36	-

Carcinoma Scrotum	-	0.36	-
Ewing's Sarcoma	-	0.73	-
Non-Hodgkin's Lymphoma	-	0.36	5.08
Others	19.13	2.55	-

Table 3: Seroprevalance of Hepatitis and HIV in various studies in Oncology patients

Sr no.	Study	Type of cancer	Seroprevalance	Seroprevalance In our study
1	Hussein et al (2021)(13)	Breast cancer	13.4% Anti-HCV	9.09% Anti-HCV
2	Ramsey et al(6)	All type of Cancer	6.5% HBsAg 2.4% Anti-HCV 1.1% HIV Antibody	2.24% HBsAg 1.68% Anti-HCV 0.36% HIV Antibody
3	Chen et al (2021) (14)	All type of Cancer	7.78% HBsAg	2.24% HBsAg
4	Mahmoudv and et al (2021)(15)	Rectal Carcinoma	3.33% HBsAg	1.64% HBsAg
		Breast Cancer	2.22% HBsAg	8.47% HBsAg
		Prostate cancer	1.11% HBsAg	1.09% HBsAg
5	Kocoglu et al (2018) (16)	Head Neck Cancer	5.88% HBsAg	14.75% HBsAg
		Rectal Carcinoma	5.6% HBsAg	8.47% HBsAg
		Oesophageal Carcinoma	5.88% HBsAg	0.55% HBsAg
		Lung Cancer	2.5% Anti-HCV	3.27% Anti HCV
6	Sinha et al (2018) (17)	All type of Cancer	0.9% HIV Antibody	0.36% HIV Antibody
7	Traore et al (2015) (18)	All type of Cancer	2.1% HIV Antibody	0.36% HIV Antibody
8	Yang et al (2019) (19)	All type of Cancer	7.7% HIV Antibody	0.36% HIV Antibody

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