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Original Research Article

A Study of Hepatitis B Cases (Detecting the Scenario of Viral Hepatitis B) in North East Costal Region of Andhra Pradesh by Using Screening Test (HbsAg) - Hepa Card Test and Confirmatory Test – Elisa Along with Viral Load by Real Time PCR in that Area

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Abstract

Introduction: More than two billion people have been infected worldwide, and of these, more than 350 million suffer from chronic Hepatitis B virus infection . Its incidence and patterns of transmission vary throughout the world in different population subgroups. In Western countries, chronic HBV infection is relatively rare and acquired primarily in adulthood, whereas in Asia and Africa, it occurs from infected mother to child, from child-to-child contact in household settings, and from reuse of unsterilized needles and syringes. Due to the often silent nature of the disease, its testing is imperative for public health, particularly for blood screening. Chronic carriers with undetected acute infection and low levels of viremia are vulnerable to HBV transmission. The majority of laboratories still use hepatitis B surface antigen (HBsAg)-based tests. WHO's elimination plan is at risk of derailment due to phases like the window period, immune control, and occult HBV infection (OBI) not being detected by standard tests. In the present study we are focusing on three diagnostic approaches for the better diagnosis of HBV. (1). Hepacard for qualitative detection of HBsAg in human serum or plasma. (2). HBsAg ELISA (cortezdiagnostics, inc) which is a confirmatory test, to avoid false positives and false negatives from Hepacard test. (3). HBV quantitative test for viral load by Real Time PCR in blood which helps to assess disease progression, treatment monitoring, disease outcome prediction and prevent transmission.

Aim: To detect the Prevalence of Hepatitis B in North east coast region of Andhra Pradesh by using rapid screening test and its confirmation by ELISA technique for the diagnosis of Hepatitis B Surface Antigen (HBsAg) along with Viral load by Real time PCR which plays a vital role in ensuring care and effective management of patients.

Materials and Methods: The present cross sectional study was conducted at Government Medical College, Srikakulam and Rangaraya Medical College Kakinada by collecting secondary data from laboratory registers of patients tested for HBsAg from September 2023 to September 2025 (Two years duration). At First the patient's serum was subjected to Detection of HBsAg by HEPA Card, a rapid immunochromatographic assay (ICA) Alere Trueline TM (Alere Medical Pvt. Ltd) kit, then all Seropositive and indetermined cases were subjected to Detection of HBsAg by ELISA. [cortezdiagnostics, inc], then all seropositive cases confirmed by ELISA were subjected to Real-Time Quantitative PCR for HBV DNA for detection of viral load in blood to take decision to patient treatment . Statistical analysis was done using Microsoft Office Excel 2010.

Results: A total of 24000 patients (12000 from males and 12000 from females) were included , out of which 167 (0.69%) were positive for HBsAg and 6 (0.025%) were indetermined cases. Out of 12000 males 102 (0.85%) were positive and 4 (0.033%) were indetermined cases. Out of 12000 females 65(0.54%) were positive and 2 (0.016%)were indetermined cases. Positivity is more in 50 – 60 yrs age group 46 (0.95%) and higher number of cases were from Surgery department 48 (0.61%) and more indeterminate cases were from surgery (2) and OBGY (2). More positives were from HIV patients 80 (5.47%). By ELISA all 167 positive cases were confirmed positive (100%). Out of 6 indetermined cases 4 (66.6%) were confirmed positive and 2 (33.3%) were confirmed negative showed that the total number of positive cases were 171 (0.71%). Out of 167 positive samples, on viral load testing 54 (32.33%) samples were showed viral load negative (NOT DETECTED) and 113 (67.66%) were VIRAL LOAD DETECTED cases according to Real Time micro PCR Analyzers. The Real Time PCR enables decentralization and near patient diagnosis and treatment monitoring of Hepatitis B infection by making it rapid, simple, robust and user friendly and offering 'sample to result' capability even at resource limited settings. The assay was used to assess the virological response to antiviral treatment.

Conclusion: Over last two decades there was a significant improvement in control of HBV infection due to screening and diagnosis, and implementation of vaccination programs and recent advances in pharmaceutical field in development of effective antiviral therapies that inhibit viral replication for long duration.
Our study showed that HBV is Endemic in North east coastal region of Andhra Pradesh. It emphasizes the need for universal vaccination to all children and establishment of strategies to prevent mother to child transmission. Our research is helpful for development of national control strategies to fight against Hepatitis B infection and the present study showed that rapid test kits are inferior to some extent which are associated with in determined results when compared to ELISA confirmatory test. HBV DNA test is a crucial tool in diagnosis and management and viral load guides treatment decisions and monitor disease progression.
Keywords: Hepatitis B Prevalence, HBsAg, Rapid diagnostic test, ELISA, Real time quantitative PCR.
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Introduction

More than two billion people have been infected worldwide, and of these, more than 350 million suffer from chronic Hepatitis B viral infection. The incidence of Hepatitis B infection and modes of transmission vary greatly throughout the world in different population subgroups [1]. In Western countries, chronic HBV infection is relatively rare and acquired primarily in adulthood, whereas in Asia and Africa, most infections occur from infected mother to child, from child-to-child contact in household settings, and from the reuse of unsterilized needles and syringes.

Due to the often silent nature of the disease, testing for HBV is imperative for public health, particularly for blood screening. Seroprevalance of HbsAg in blood donors is also very high and so intensifying the screening and vaccination of the population for Hepatitis B is crucial [2].

Chronic carriers with undetected acute infection and low levels of viremia are vulnerable to HBV transmission and also with a high risk of cirrhosis and hepatocellular carcinoma [3]. Studies also show that early diagnosis and treatment can reduce the risk of the development of long-term complications and prevent further transmission.

The most common methods of diagnosing Hepatitis B are serology based assays and molecular tests and HBV DNA is detectable about 3 weeks before the serological markers appears. The majority of diagnostic laboratories still use hepatitis B surface antigen (HBsAg)-based tests. WHO's elimination plan is at risk of derailment due to phases like the window period, immune control, and occult HBV infection (OBI) not being detected by standard tests. Here, in this research article, we are focusing on THREE diagnostic approaches for the better diagnosis of HBV.

Hepacard is a visual, rapid, sensitive and accurate one step immunoassay for the qualitative detection of Hepatitis B surface antigen (HBsAg) in Human serum or plasma [4]. The assay is intended to be used as an aid in the recognition and diagnosis of acute infections and chronic infectious carriers of the Hepatitis B Virus (HBV). It has silent features like it detects all the 11 subtype of HBsAg, Antigen Sensitivity- 0.5 ng/ml, No sample preparation required, See through Device for easy result interpretation, Shelf life-30 months at 2-30°C.

WHO Evaluated with 100% Sensitivity. But detection of hepatitis B surface antigen by immunochromatographic essay is only a screening test there may be so many false positives or false negatives will be present and the estimation of seroprevalence of hepatitis B infection will be misguided, so in our study we included ELISA test which is a confirmatory test. The HBsAg ELISA [cortezdiagnostics, inc] is a solid-phase enzyme-linked Immunosorbent Assay based on the principle of the Antibody sandwich technique.

This test is intended for qualitative detection of HBsAg at a sensitivity level of 0.10 IU/mL in Human serum or plasma. It is intended to be used by professionals as an aid in the diagnosis of an infection with HBV. HbsAg ELISA and Rapid antigen test (HEPACARD) were used to detect the surface antigen of hepatitis B [5].

HBV Quantitative testing is performed to determine the viral load in a patient's blood. It is essential to assess the viral load because it helps doctors to monitor the progression of the hepatitis B infection and can make informed decisions regarding treatment and evaluate the effectiveness of antiviral medications.

Here is why HBV quantitative testing is important:

- **Assessing Disease Progression:** By measuring the quantity of HBV DNA in the blood, healthcare professionals can determine the extent of viral replication and assess the disease progression. Higher viral loads often

indicate more active infections and an increased risk of liver damage.

- **Monitoring Treatment Efficacy**: HBV quantitative testing is essential in monitoring the effectiveness of Antiviral therapy. Regularly checking the viral load allows doctors to evaluate the response to treatment and make adjustments if necessary. Decreasing viral load levels indicate that the treatment is effectively suppressing viral replication.
- **Predicting Disease Outcomes:** Research has shown that higher baseline viral loads are associated with an increased risk of developing Liver cirrhosis and Hepatocellular carcinoma (HCC). Monitoring viral load levels over time can help predict disease outcomes and guide healthcare providers in developing appropriate management strategies.
- **Guiding Treatment Decisions:** The results of HBV quantitative testing help healthcare providers make informed decisions about when to start or stop antiviral therapy, adjust medication dosages or switch to alternative treatment options.
- **Preventing Transmission:** Individuals with high viral loads are more likely to transmit HBV to others. Regular monitoring through HBV quantitative testing allows healthcare professionals to identify individuals with high infectious potential and take steps to prevent transmission, such as providing education on safe practices and recommending vaccination for close contacts.

The normal range for the HBV DNA test, which measures the quantity of Hepatitis B Virus (HBV) DNA in the blood, can vary slightly between different laboratories and assays. However, it typically falls within a range of 10 to 1,000,000,000 International Units per millilitre (IU/mL). This range is expressed in logarithmic units, spanning from 1.00 log IU/mL to 9.00 log IU/mL.

An HBV DNA test, which measures the presence of Hepatitis B Virus DNA in the blood, offers crucial insights into the status of a Hepatitis B infection. The possible HBV DNA test interpretations include:

- **Active Infection:** Detectable HBV DNA in the blood indicates an active Hepatitis B infection. The HBV DNA viral load can vary, with higher levels often correlating with increased infectivity.
- **Chronic Infection**: Elevated and sustained HBV DNA levels over 6 months typically signify a chronic Hepatitis B infection. This is an indication that the virus has persisted in the body.
- **Acute Infection**: A sudden rise in HBV DNA levels, accompanied by other serological markers, may suggest an acute Hepatitis B infection. This is an early phase of the disease.
- **Viral Replication:** The quantity of HBV DNA can indicate the rate of viral replication. Higher levels may necessitate antiviral therapy to reduce viral activity.
- **Undetected:** An 'Undetected' result means that HBV DNA is not present in significant quantities, indicating a lack of active viral replication.

Materials and Methods

A cross sectional study was conducted at Government General Hospital, Srikakulam and Government General Hospital, Kakinada by collecting secondary data from laboratory registers of patients tested for HBsAg from September 2023 to September 2025 (two years duration). Prior permission for the study was obtained from concerned authorities. Demographic details like age, gender, clinical details and HBsAg test results of the patients were collected.

Detection of HBsAg by HEPA Card: A venous blood sample of 5 ml was collected with standard precautions from patients. The blood was allowed to clot for 45 minutes at room temperature and the serum was separated after centrifugation.

The serum was then subjected to one step rapid immunochromatographic assay (ICA) AlereTrueline TM (Alere Medical Pvt. Ltd) kitfor detection of HBsAg following manufacturer instructions.

Detection of HBsAg by ELISA. [cortezdiagnostics, inc]: Principle of HBsAg ELISA Assay Kit: The HBsAg ELISA Test kit employs an antibody sandwich ELISA technique where monoclonal antibodies unique to HBsAg, are pre-coated on polystyrene microwell strips.

The serum or plasma sample is added together with a second antibody, the HRP Conjugate, (horseradish peroxidase) and directed against a different epitope of HBsAg. Throughout the time of incubation, specific immunocomplex that may have formed (indicating presence of HBsAg) is captured on the solid phase. After washing, to eliminate serum proteins and unbound HRP-conjugate, chromogen solutions containing tetramethyl-benzidine (TMB) and urea peroxide are added to the wells. Next, the colorless chromogens are hydrolyzed by the bound HRP-conjugate to a blue-colored product while in the presence of the antibody-antigen-antibody (HRP) sandwich immunocomplex. Halting the reaction with sulfuric acid, the blue color then turns yellow. The color intensity can be gauged proportionally to the amount of antigen captured in the wells, and to the

amount in the sample, respectively. The wells remain colorless if the HBsAg result is negative.

Interpretations of HBsAg ELISA Test Results: (S = the individual optical density (OD) of each specimen),

Negative Results (S/C.O. <1): Samples giving an optical density less than the Cut-off value are considered as negative, which indicates that no HbsAg has been detected with this HBsAg ELISA, so the patient is probably not infected with the hepatitis B virus.

Positive Results (S/C.O. >1): Samples giving an optical density greater than or equal to the Cut-off value are considered initially reactive, which indicates that HBV surfaces antigen has probably been detected with this HBsAg ELISA. HBsAg ELISA Assay Performance Characteristics

Analytical Specificity

1. No cross reactivity observed with samples from patients infected with HAV, HCV, CMV, HIV, and TP
2. No interference from rheumatoid factors up to 2000U/ml observed
3. No high dose hook effect up to HBsAg concentrations of 200000ng/ml observed during clinical testing.

Real-time quantitative PCR for HBV DNA: HBV viral load can help in treatment decisions [6]. DNA was extracted from 200 µL of serum using the QIAamp DNA Mini Kit (Qiagen, Hilden, Germany) according to the manufacturer's instructions. DNA was eluted into 100 µL nuclease-free water and 5 µl added to a 25 µl PCR reaction mixture.

The reaction was carried out using a commercial SYBR-Green reaction mix (Qiagen, Hilden, Germany). The kit contains HotStarTaq polymerase which is included to avoid false positives in the quantitative PCR. The primer sequences were 5'-GTG TCT GCG GCG TTT TAT CA (sense) and 5' GAC AAA CGG GCA ACA TAC CTT (antisense) designed to amplify a 98 base pair product from positions 379 to 476 of the HBV genome. Thermal cycling was performed in an ABi 5700 sequence detection system (PE Applied Biosystems, Warrington, UK). Reaction conditions were: 95°C for 15 minutes followed by 40 cycles of 94°C for 15 seconds, 55°C for 30 seconds and 72°C for 30 seconds. A four point standard curve (1.5×10^8copies per millilitre (cpm), 1.5×10^6cpm, 1.5×10^4cpm, 1.5×10^2cpm) was generated from a high titre plasma donation quantified by end point dilution PCR. The calibration of this standard was confirmed by comparison with an International HBV DNA standard, (97/746) (NIBSC, Potters Bar, UK). Test samples falling above the top of the standard curve were re-assayed at a dilution of 1:100. Each test run included positive and negative controls. The performance of the assay was evaluated by comparison with a commercial assay (HBV Monitor, Roche Molecular Systems, Inc., Branchburg, NJ 08876 USA) performed according to the manufacturer's instructions.

Data management: The data obtained in the ABi real time machine after the PCR amplification and quantification of DNA was exported as an Excel spreadsheet into an Access database designed for the study. The viral results were merged with HBV serological results prior to data analysis.

Statistical Analysis: Statistical analysis was done using Microsoft Office Excel 2010.

Results

Among 24000 patients of total study group 167 were positive for hepatitis B surface antigen accounting for 0.69%.

Table 1: Gender wise distribution of total study group (n= 24000)

Gender	Total cases	Percentage
Males	12000	50%
Female s	12000	50%
Total	24000	100%

Table -1 Showed that out of 24000 study group, 12000 (50%) were males and 12000(50%) were females.

Table 2: Gender wise distribution of seropositive cases

Gender	Total study group	Seropositive cases	In determined Cases	Percentage of seropositive cases	Percentage of in determined cases
Males	12000	102	4	**0.85%**	**0.033%**
Females	12000	65	2	0.54%	0.016%
Total	24000	**167**	**6**	0.69%	0.025%

Table 2 Showed that Out of 12000 male cases, 102 were positives [0.85 %] and 4 results were indetermined due to weak bands accounting for 0.033% and out of 12000 female cases, 65 were positives [0.54%] and 2 were indetermined cases accounting for 0.016% showing that sero positivity is more in males.

Table 3: Age wise distribution of Seropositive cases (n=167)

Age in years	Total study group	Seropositive cases	In determined cases	Percentage of seropositive cases	Percentage of in determined cases
0-10	400	0	0	0%	0%
11-20	950	4	0	0.42%	0%
21-30	2010	10	0	0.49%	0%
31-40	3010	20	3	0.66%	0.099%
41-50	3920	37	1	0.94%	0.025%
51-60	4800	46	2	**0.95%**	0.041%
61-70	3120	26	0	0.83%	0%
71-80	3900	20	0	0.51%	0%
81-90	1890	4	0	0.21%	0%
Total	24000	167	6	**0.71%**	0.027%

Table 3 showed the sero positivity is more in age group 50-60 [0.95%] followed by 40-50 [0.94%]. In determined cases are more in age group 40-50 [0.099%] followed by 50-60[0.041%]

Table 4: Department wise distribution of Seropositive cases (n=167)

Department	Total cases	Sero positive cases	Percentage of seropositive cases	In determined cases	Percentage of in determined cases
Medicine	5300	35	0.66%	1	0.018%
Surgery	7800	48	0.67%	2	0.025%
OBG	1400	21	1.5%	2	0.14%
Ortho	1900	6	0.31%	0	0
ENT	1500	5	0.33%	0	0
Ophthalmology	4900	27	0.5%	1	0.02%
Causality	1200	35	0.51%	0	0
Total	24000	167	0.69%	6	0.027%

Table 4 showed out of 167 seropositive cases highest number were from surgery department [0.67%] followed by Medicine department [0.66%]. Maximum indetermined results are from surgery [0.025%] and OBG [0.14%]

Table 5: Distribution of seropositives based on Clinical symptoms (n=167):

Clinical diagnosis	Total	Sero positive cases	Indetermined cases
HIV	1462	**80[5.47%]**	2[0.13]
Jaundice	1243	20[1.6%]	
Gastrointestinal symptoms	2963	34[1.14%]	2[0.2]
Routine screening for patients posted for different surgeries	18332	33[0.18%]	2[0.16]
Total	24000	167[0.69%]	6[0.027%]

Table 5 showed out of 167 seropositive cases highest number were from HIV patients 80 [5.47%].

Table 6: Percentage of seropositive cases confirmed by ELISA

Number of seropositive cases	Number of cases confirmed by ELISA	Percentage of confirmed cases
167	167	100%

Table – 6 showed When 167 seropositive cases kept for ELISA all showed positive cutoff value accounting for 100%.

Table 7: Percentage of in determined cases confirmed by ELISA (n=6)

Total no of in determined cases	No of cases positive by ELISA	Percentage of cases positive by ELISA	No of cases negative by ELISA	Percentage of cases negative by ELISA
6	4	66.6%	2	33.3%

Table – 7 showed that out of 6 indetermined cases 4 cases were confirmed by ELISA and 2 cases were not confirmed. So the total number of seropositive cases are 171 (167=4) accounting for 0.71%.

Table 8: Viral load DETECTED in relation to age group of HBsAg status (n=167)

Age Group In Years	Dna Positive	HBV DNA Result in IU/Ml (Viral Load Detected If >55 IU /Ml)	Percentage Of Viral Load Detected , n =167
0-10	0/0 (100%)	-	-
11-20	4/4(100%)	2- <55 IU/ML 1- 1900 IU/ML 1- 7400 IU/ML	1.19%
21-30	10/10(100%)	3-<55 IU/ML 2- 100-1000 IU/ML 4- 1000-10,000 IU/ML 1- 1,900,000 IU/ML	4.19%
31-40	20/20(100%)	8< 55 IU/ML 3-100-1000IU/ML 4-1000-10,000 IU/ML 1- 38,000 IU/ML 2- 50,000-100,000 IU/ML 1- >1,00,000IU/ ML 1-9X 10 to the power of 7 IU/ML	7.18%
41-50	37/37(100%)	11< 55 IU/ML 6-100-1000IU/ML 7-1000-10,000 IU/ML 3- 11000-100,000 IU/ML 4- 100,000-10,00,000 IU/ML 2- >10,00,000IU/ ML 4-1X 10 to the power of 7 IU/ML	15.56%
51-60	46/46(100%)	13< 55 IU/ML 6-100-1000IU/ML 3-1000-10,000 IU/ML 7-11000-100,000 IU/ML 4-100,000-10,00,000 IU/ML 7->10,00,000IU/ ML 6-1X 10 to the power of 7 IU/ML	19.76%
61-70	26/26(100%)	7< 55 IU/ML 3-100-1000IU/ML 2-1000-10,000 IU/ML 5-11000-100,000 IU/ML 2-100,000-10,00,000 IU/ML 3->10,00,000IU/ ML 4-1X 10 to the power of 7 IU/ML	11.37%
71-80	20/20(100%)	6< 55 IU/ML 3-100-1000IU/ML 1-1000-10,000 IU/ML 3-11000-100,000 IU/ML 3-100,000-10,00,000 IU/ML 2->10,00,000IU/ ML 2-1X1,00,000,000 IU/ML	8.3%
81-90	4/4(100%)	4<55 IU/ML	-
TOTAL	167	-	67.66%

Table 8 showed that the highest percentage of viral load was seen in 51 – 60 yrs (19.71%) followed by 41- 50 yrs (15.56%).

Table 9: Distribution of Percentage of Detection of Viral Load (N=167)

Viral Load In Iu/Ml	Percentage
<55	54(32.33%)
100-1000	23(13.77%)
1000-10,000	23(13.77%)
10,000-100,000	21(12.57%)
100,000-10,00,000	15(8.98%)
>10,00,000	31(18.56%)
TOTAL	167(100%)

Table 9 Showed that out of 167 seropositives, the HBV viral load DETECTED case were 113 (67.66%) and Not Detected cases were 54 (32.33%).

Discussion

The present study targeted towards patients who were posted for Surgeries (routine screening tests), Patients with jaundice and gastrointestinal symptoms and HIV patients with an objective of screening for Hepatitis B virus infection by detecting HBsAg using HEPA card and confirming it by ELISA. As it was the earliest antigen to appear in the infected person's serum/blood and last parameter to disappear which is more sensitive test than antibody detection. To rule out the false positive results we confirmed it by ELISA which is highly sensitive and specific.

Similar findings were seen in the study of Bhuvan nagpal et al [7] where higher accuracy of ELISA technique than more popular RAPID screening kits used. When we discuss about the Gender wise incidence of the present study, more positivity was seen in male population and It is correlated with the study of Manoj kumar et al (50.2%) [8]. This might be due high risk sexual behavior, and increased chance of blood transfusions due to road traffic accidents and occupational exposure. Age wise distribution of the present study, more incidences were seen between 50-60years followed by 40-50years. It is correlated with the study of Bingyu yam et al [9] (High prevalence in 40-49yrs), It could be due to injudicious use of unsterile needles, unsafe sexual practices and due to unscreened blood transfusions. When we observed the study group no one have the infection between 0-10years age group indicating that there was 0% vertical transmission which might be due proper antenatal screening.

When we studied various groups for the prevalence of the infection, we found more seropositives in HIV patients indicating that increased co – association of HIV infection with Hepatitis B infection. By ELISA all 167 positive cases were confirmed positive (100%). Out of 6 indetermined cases 4 (66.6%) were confirmed positive and 2 (33.3%) were confirmed negative showed that the total number of positive cases were 171 (0.71%).

Out of 167 positive samples, on viral load testing 54 (32.33%) samples were showed viral load negative (not detected) and 113 (67.66%) were viral load detected cases according to Real Time micro PCR Analyzers. The assay was used to assess the virological response to antiviral treatment.

Keeping all these facts in mind there is a need for intense IEC activities regarding Hepatitis B virus, its modes of transmission and about the measures which prevents transmission from person to person. As the saying 'prevention is better than cure' it is better to prevent Hepatitis B infection than to treat with anti - viral drugs which are associated with many side effects and have low curative value.

Table 10: Comparative Study of Seroprevalance of Hepatitis B Infection in Different Studies

Author	Year of study	No of samples tested	No of positive cases	Prevalence rate
Trupthi et.al[10]	2016-17	6905	39	0.56%
Bulle et.al[11]	2015	4649	73	1.57%
Patil et.al[12]	2010	767	23	2.99%
Quadri et.al[13]	2010	4283	70	1.63%
Narayanaswami et.al[14]	-	3182	105	3.3%
Sood et.al[15]	2007-08	3196	28	0.87%
Vedanti B et al[16]	2019- 2021	20676	135	0.65%
Present study	**2023-25**	**24000**	**171**	**0.71%**

The prevalence rate of hepatitis B infection of present study [0.71%] was correlating to prevalence rates of vedanti B et al [0.65%].

In the present study the significant HBV viral load was seen in the age group of 51-60 yrs and it is correlating with the study of Ashis Negri et al.

In general real-time PCR methodology is robust and easy to perform and avoids many of the potential contamination pitfalls that are associated with gel-based and hybridization-based post-PCR detection methods.

The assay was used to assess the virological response to short-term treatment with anti-viral medication. The lack of total clearance of HBV DNA is most likely due to short-term treatment.

Conclusion

Over last two decades there was a significant improvement in control of HBV infection due to considerable progress of virology tools for screening and diagnosis, in implementation of vaccination programs and due to recent advances in pharmaceutical field in development of effective antiviral therapies that inhibit viral replication for long duration.

Our study showed that Hepatitis B Virus is endemic in North East Coastal region of Andhra Pradesh. It emphasizes the need for universal vaccination to all children and establishment of strategies to prevent mother to child transmission.

Our research is helpful for development of National control strategies to fight against Hepatitis B infection and provides basis for managing hepatitis B national prevalence surveys and control measures and there by reduces hepatitis B endemicity in north east coastal region of Andhra Pradesh in near future.

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