



Spreading Status of Hepatitis B Virus in Patients Attending Shone Primary Hospital from 2013-2015 E.C, Hadiya Zone, Central Ethiopia

Denebo Sebaro Wanore ^a, Emebet Melese Haile ^b,
Abulfeta Bilal Assefa ^c, Redait Demissie Lakwe ^d,
Molito Horamo Katore ^c, Mekuriaw Kassie Ademe ^e
and Solomon Demeke Ofole ^{f*}

^a Department of Biology, College of Natural and Computational Sciences, Wachemo University,
P.O. Box.667, Hossana, Ethiopia.

^b Department of Medical Laboratory Science, College of Medicine and Health Science, Wachemo
University, P.O.Box.667, Hossana, Ethiopia.

^c Department of Information Technology, College of Engineering and Technology, Wachemo
University, Ethiopia, P.O.Box.667, Hossana, Ethiopia.

^d Department of Information Systems, College of engineering and Technology, Wachemo
University, P.O.Box.667, Hossana, Ethiopia.

^e Department of Software Engineering, College of Engineering and Technology, Wachemo University,
Ethiopia, P.O.Box.667, Hossana, Ethiopia.

^f Department of Computer Science, College of Engineering and Technology, Wachemo University,
Ethiopia, P.O.Box.667, Hossana, Ethiopia.

Authors' contributions

This work was carried out in collaboration between all authors. Author DSW designing study, performing analysis, writing the first draft of the manuscript, reading and approving the final manuscript. Author SDO follow up the research, managing the analysis and searching all possible literatures, reading and approving the final manuscript. Authors EMH, ABA, RDL, MHK and MKA collect, feed, filter and analyze the data in computer using software during the research study. All authors read and approved the final manuscript.

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*Corresponding author: Email: demekesol@gmail.com;

ABSTRACT

Hepatitis virus is an inflammation of liver grouped among a member of hepadnavirus family with partially double stranded circular DNA genome, whose envelope contains protein called surface antigen. Due to existence of transmission methods within day to day activity, due to lack of knowledge, misuse of drugs of HBV and carelessness of health professionals we committed assessment of spreading status of HBV in Shone primary Hospital, to imprint knowledge among society, to recommend health professionals and concerning bodies too. This study was based on stratified and purposeful sampling. It proceeded with sex (male and female) and age group (<5, 6-15, 16-25, 26-35 and >36) as variables. During this study secondary data from 2013-2015 E.C was used from the Hospital's record office and laboratory registration books. As a result, age groups of <5, 6-15, 16-25, 26-35 and >36 were founded with 9.65%, 14.9%, 31.6 %, 24.44% and 18.41% among 114 positive patients in 2013 E.C, 9.4%, 12.75%, 41.6%, 27.5% and 8.75% among 149 positive patients in 2014 E.C and 8.5%, 16.33%, 34%, 23.53% and 17.64% among 153 positive patients in 2015 E.C respectively. And over all of 18.96% among patients examined for HBV were positive. 2.53% average increment for successive years and 5.52% and 2.2% annual increments was seen among females. Generally, lack of knowledge, unsafe blood transfusion, sexual intercourse, misuse of drugs and others were present among dwellers. So, knowledge imprinting, planning, wise use of drugs, punishing illegal, traditional peoples working with blood and contact without permission was needed to eradicate spread of disease.

Keywords: Age group; blood transfusion; hepatitis B Virus; patients; surface antigen.

1. INTRODUCTION

Worldwide, about 2 billion people are infected with hepatitis B virus (HBV). Hepatitis B is a viral infection that attacks the liver and can cause both acute and chronic disease. It is estimated that 350 million people globally are chronic carriers of whom 170 million reside in Africa. It is the leading cause of chronic hepatitis, cirrhosis, and hepato-cellular carcinoma. The virus is transmitted through contact with the blood or other body fluids of an infected person. Hepatitis B Virus is transmitted between people by direct blood-to-blood contact or semen and vaginal fluid of an infected person [1].

Modes of transmission are the same as those for the human immunodeficiency Virus (HIV), but the hepatitis B virus is 50 to 100 times more infectious. Unlike HIV, the hepatitis B virus can survive outside the body for at least seven days. During this time, the virus can still cause infection if it enters the body of a person who is not protected by the vaccine. In developing countries, common modes of transmission are: perinatal (from mother to baby at birth) early childhood infections (in apparent infection through close

interpersonal contact with infected household contacts) unsafe injection practices unsafe blood transfusions unprotected sexual contact [1].

Chronic infection with HBV is dynamic and progresses through. Four major phases which are: immune-tolerant, immune-reactive, inactive phase and HBeAg-negative chronic HBV infection. However, these phases are not necessarily sequential and are important to determine those that require treatment, as well to predict prognosis. HBV has a complex serology and natural history as a result of multiple serological markers which include HBsAg, anti HBs, anti HBc, HBeAg, anti HBe and HBV DNA quantification (Akere et al., 2015).

The existence of inactive hepatitis B carriers with normal liver histology and function suggests that the virus is not directly cytopathic. The fact that patients with defects in cellular immune competence are more likely to remain chronically infected rather than to clear HBV supports the role of cellular immune responses in the pathogenesis of hepatitis B related liver injury. The model that has the most experimental support involves cytolytic T cells sensitized

specifically to recognize host and hepatitis B viral antigens on the liver cell surface (Kasper, 2015).

HBV is a member of the hepadnavirus family. It is 42-nm enveloped virions, with an icosahedral nucleocapsid core containing a partially double-stranded circular DNA genome. The envelope contains a protein called the surface antigen (HBsAg), which is important for laboratory diagnosis and immunization. Within the core is a DNA-dependent DNA polymerase. HBx is an activator of viral RNA transcription and may be involved in oncogenesis because it can inactivate the p53 tumor suppressor protein. The DNA polymerase has both RNA-dependent (reverse transcriptase) and DNA dependent activity (Warren, 2014).

The prodromal symptoms of acute viral hepatitis are systemic and quite variable. Constitutional symptoms of anorexia, nausea and vomiting, fatigue, malaise, arthralgias, myalgias, headache, photophobia, pharyngitis, cough, and coryza may precede the onset of jaundice by 1–2 weeks. The nausea, vomiting, and anorexia are frequently associated with alterations in olfaction and taste. A low-grade fever between 38° and 39°C (100°–102°F) is more often present in hepatitis A and E than in hepatitis B or C, except when hepatitis B is heralded by a serum sickness–like syndrome; rarely, a fever of 39.5°–40°C (103°–104°F) may accompany the constitutional symptoms. Dark urine and clay-colored stools may be noticed by the patient from 1–5 days before the onset of clinical jaundice (WHO, 2002).

1.1 Statement of the Problem

Hepatitis is an inflammation of liver and obviously liver plays crucial roles in digestion of lipids and the site where anaerobic respiration also held. In Shone town due to lack of education regarding Hepatitis viruses and others with in society the dwellers are without knowledge of transmission methods, effects behind diseases and alike. Due to these problems Shone peoples knowledge and attitude towards Hepatitis virus is less. So, peoples are exposed to HBV disease.

Misuse of drugs given by health professionals expose the disease to stay within the people rather than overthrowing the spread and replications of viruses. According to Shone primary Hospital health professionals, users do not use given drugs wisely and procedurally. Even though drugs are given after disease

obtained as HBV, they directly enter to despair themselves.

The transmission methods like unsafe injection practices, close interpersonal contact, Mother to baby, blood transfusion and sexual intercourse (Burnett R. et al., 2005) are efficient in day to day activities of people. So, the problem exposition to HBV disease seems increasing because people do not realized diseases status and people do not undertook prevention mechanisms.

Additional problem obtained behind this disease is that people exposed to HBV stay more time in bed and due to this the social, political and economic impacts emanated as the result of the disease. The economic crises occurred among specific group of people or individuals. So, the increment of this disease will ca use socio-economic defects to the growth of individual as well as the whole country's economy.

1.2 Objectives

1.2.1 General objectives

- To assess the spreading status of HBV as either increasing or decreasing among Hospital patients.

1.2.2 Specific objectives

- To evaluate the effects of disease on socio-economic status of society.
- To demonstrate HBV virus's prevalence in Hospital users.
- To identify the possible causes of spread of HBV disease.

1.3 Significance of the Study

The study provided basic pre-disease prevention and post-disease prevention techniques as well as drug usage procedures based on required extent of time and other requirements via leaflet noticed. It also provided recommendations to dwellers, blood transfusing agents like health professionals; youth aged group of people and a like concerning body.

In addition to above the study also demonstrated the prevalence of disease and pointed the age group that is highly exposed to disease. It also directed the transmission methods of disease to imprint the people with the knowledge regarding HBV and enhanced the attitude of people towards disease by pointing its effects on human

body as well as socio-economic effects and status of expositions to death too.

The study also invested prepared tract notes with a content of transmission, prevention, status, and socio-economic impacts of HBV on individuals as well as the whole society. During distribution of tract notes the people were provided with explanations up on points which were unclear for dwellers. Especially in Arencha kebele dwellers actually provided with such knowledge enhancement technique.

2. MATERIALS AND METHODS

2.1 Description of Study Area

The study was conducted at Shone Hospital, which was founded in Hadiya zone, Central Ethiopia. Shone is 273KM far of Addis Ababa, the capital city of Ethiopia. Shone is 1549m high above sea level and it is geographically located at 7.144421° to 7°8'39" north latitude and 37.95558" to 37°57'20" east longitude (HZPEDD, 2001). The total population of the city is 41,900 (Census, 2002).

2.2 Methods of Data Collection

The study data focused on secondary data of Shone primary Hospital from 2013 -2015 E.C, which was obtained from Hospital information and data record office and recorded laboratory documents. The data collection technique relayed on secondary data collection method, means it had used methods like counting the recorded data. The data collected accuracy was measured by focusing on our group members' participation during data collection which has been held non-simultaneously during collection of data and counting of records.

2.3 Sample Size and Sampling Techniques

2.3.1 Sample size

The sample size of the study was encountered all patients recorded as Hepatitis B virus patients from 2013 E.C – 2015E.C on Shone primary Hospital examination registration books.

2.3.2 Sampling techniques

This assessment had used stratified sampling techniques in which age group was considered as specific group or strata. According to our

study ≤ 5 years, 6-15 years, 16-25 years, 26-35 years and above 35 years had been our strata. The data had also differentiated to sex groups as male and female, adults, youth, elders, and children because our study also interested in identifying age groups highly exposed to disease.

2.4 Data Analysis Techniques

The data obtained had been analyzed using different statistical analyzing techniques like mean, mode and quantitative analysis of numerical data obtained. It also focused on the descriptions provided by professional during collection and other analyzing methods from different sources and applications were used.

2.5 Data Presentation

The presentation of data collected had been presented by different tabular presentation techniques and percentage as well as pie chart presentation techniques to summarize the more accurate data.

3. RESULTS

According to data from the study area, 2391 patients were examined for HBV disease and in between these patients 613 patients were founded with positive result of test. The data encounter provided that 149 were infected by HBV among 677 examined patients in 2013 E.C, 202 were infected among 843 examined patients in 2014 E.C and 262 patients were recorded as HBV positive among 871 examined patients in 2015 E.C.

In the above result 198 patients among positive tested were neglected from analysis because the data was lacking either age group or sex group, to which we would arrange in order to obtain required result. According to data from Shone primary Hospital the three successive year's data summary had summarized in tabular presentation technique as in the following Table 1.

4. DISCUSSION

While the overall prevalence was calculated 416/2193 examined patients positive, means 18.96% were positive from patients from 2013 E.C- 2015 E.C. from which 2.53% average increment, 5.52% and 2.2% annual increment was seen among female sex group.

4.1 Status of HBV Based on Sex Group

From above tabular analysis of data Hepatitis B virus infection was highly prevalent among female rather than males because within data obtained females encounter 66.3% among 416 Of infected patients from 2013 E.C – 2014 E.C. this in turn indicates that males are less affected by HBV infections because they encountered 33.7% among 416 patients from 2013 E.C – 2014 E.C.

In addition to this HBV infection was also increasing while we compare data of each year among females rather than males. According to this in 2013 E.C – 2014 E.C females encountered 62.28%, 67.8% and 70% respectively for three successive years. This shows that HBV disease increases among female sex groups in contrast decreasing among males.

In SNNPRs in Arbaminch city study among blood donors reported that prevalence of HBV among study participant was 4.7% while HCV was not detected but our study shown 2.53% of average increment. From 17 participants tested positive for HBV, 8 (47%) were males. The test positivity

among male was 8/197 (4.1%) while among females 9/162 (5.6%) and more than three fourth participants tested positive were age less than 25 age [2]. Even though our increment percentage is high compared to our study this actually confirm to our result description because the above study showed increment among females than males.

In contrast to our study, most studies suggested that prevalence of HBV infection was more among males than females. But studies for identification of specific sex group suggested that the prevalence of HBsAg in hemodialysis patients is not due to sex difference in response to HBV infection because mostly males are highly exposed to HBV infection [3].

4.2 Status of HBV Based on Age Group

Among the age groups that had been used as variables for our study HBV infection most wisely focused up on age group which was in between ages of 16 and 35 mostly. This age group was youth and most working age group, due to this result it is preferable to judge that HBV infection as it attacks productive age groups rather than disabled.

Table 1. Result of HBV patients from 2013 E.C – 2015 E.C

Year	Total examined	Total positive resulted (%)	Variables	Sub-variable	Positive Number	Percentage among positives(%)
2013 E.C.	642	114 (17.75%)	Sex group	Male	43	37.72%
				Female	71	62.28%
			Age group	<5	11	9.65%
				6-15	17	14.9%
				16-25	36	31.6%
26-35	29	24.44%				
>36	21	18.41%				
2014 E.C.	789	149 (18.9%)	Sex group	Male	48	32.2%
				Female	101	67.8%
			Age group	<5	14	9.4%
				6-15	19	12.75%
				16-25	62	41.6%
26-35	41	27.5%				
>36	13	8.75%				
2015 E.C.	762	153 (20.1%)	Sex group	Male	49	30%
				Female	104	70%
			Age group	<5	13	8.5%
				6-15	25	16.33%
				16-25	52	34%
26-35	36	23.53%				
>36	27	17.64%				

According to Fisseha Wale et al., [4], 16-22 age group females and 23-28 aged groups were highly exposed to HBsAg and their study showed majority of participant were in between 16-28 aged groups with percentage value of 68.5% of screened patients, most of which were pregnant women, this study suggested that this age group was highly productive age group and females which was pregnant women was exposed due to less immunity. And others were may be due to HBsAg transmission methods.

Based on data analysis result 61.55% of infected people founded in between 16-35 aged people and 38.45% of infected peoples founded among 0-15 and above 36 aged patients collectively. From further analysis patients within 16-25 were founded 36.05% of patients from 2013E.C – 2014E.C data and those of 26-35 aged were founded 25.5% of above three years patients. This result provided as with high spreading status of HBV infection among these age groups of people because other age groups of patients like <5, 6-15, and >36 attained the percentage status of 9.13%, 14.66% and 14.66% respectively from three successive years data from 2013 -2014 E.C. This result can also provide us with a clue about infections less prevalent among 0-15 and above 36 aged patients.

Even though HBV infection seems less among 0-15 and above 36 within Shone primary Hospital user patients the status of this disease is increasing annually while data obtained was compared for those three successive years from 2013 -2014 E.C., according to this in 2013 E.C HBV infection was 9.65%, 14.9%, 31.6%, 24.44% and 18.41% among 114 patients, sequentially for <5, 6-15, 16-25, 26-35 and >36 aged patients, in 2014 E.C HBV infection was 9.4%, 12.75%, 41.6%, 27.5% and 8.75% among 149 patients, sequentially for <5, 6-15, 16-25, 26-35 and >36 aged patients and in 2015 E.C HBV infection was 8.5%, 16.33%, 34%, 23.53% and 17.64% among 153 patients, sequentially for <5, 6-15, 16-25, 26-35 and >36 aged patients.

According to previous studies in Ethiopia among blood donors 5.3% positive patients were in age group of 26-35 and 6.3% were in age group of 36-45 [5]. This may be due to the study focus only based among blood donors and because most higher aged groups donate blood. In addition to this Abate et al.,[6] founded 5.9% among 36-45 age groups and 8.3% among 45 and above years. However, age distribution and

serio-prevalence showed insignificance association during their study but even though their study variables fit their study encounters only blood donors as study group.

The overall prevalence of this study showed 2.53% increment of disease from 2013-2015 E.C. this points the existence of major health problem in female sex group and 16-35 age groups of society. This finding was lower as compared 3.73% finding of study held among blood donors at Dire Dawa blood bank service [7].

4.3 Pie Chart Description of 2013 E.C Data

As a result this pie chart description provides us with clear data presentation. From the description pie chart the 2013 E.C data obviously tells us the status of disease spread of HBV infection is more in 16-25 aged groups (31.6%) of people of study area. And this group is the working group and behind this it is appropriate to judge what effect will emanate behind this spread. Not only this age group but also 26-35 aged groups (24.44%) are highly exposed compared to others. Generally from above figure 16-25 aged and 26-35 aged groups were leading in spreading status of HBV [8].

4.4 Pie Chart Description of 2014 E.C Data

From the description pie chart the 2014 E.C data obviously tells us the status of disease spread of HBV infection is more in 16-25 aged groups (41.60%) of people of study area. And this group is the working group and behind this it is appropriate to judge what effect will emanate behind this spread. Not only this age group but also 26-35 aged groups (27.50%) are highly exposed compared to others. Generally from above figure 16-25 aged and 26-35 aged groups were leading in spreading status of HBV.

4.5 Pie Chart Description of 2015 E.C Data

From the above pie chart it is easy to know the spreading status of HBV obviously among age group, from the description pie chart the 2015 E.C data obviously tells us the status of disease spread of HBV infection is more in 16-25 aged groups (34%) of people of study area. And this group is the working group and behind this it is

appropriate to judge what effect will emanate behind this spread. Not only this age group but also 26-35 aged groups (23.53%) are highly exposed compared

to others. Generally from above figure 16-25 aged and 26-35 aged groups were leading in spreading status of HBV [9,10].

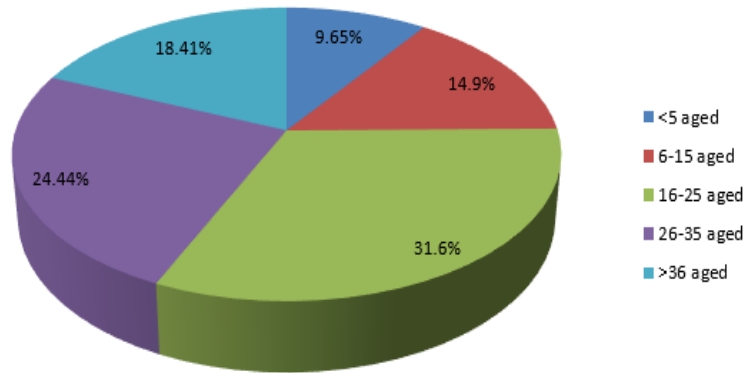


Fig. 1. 2013 E.C HBV positive patients' data via pie chart analysis

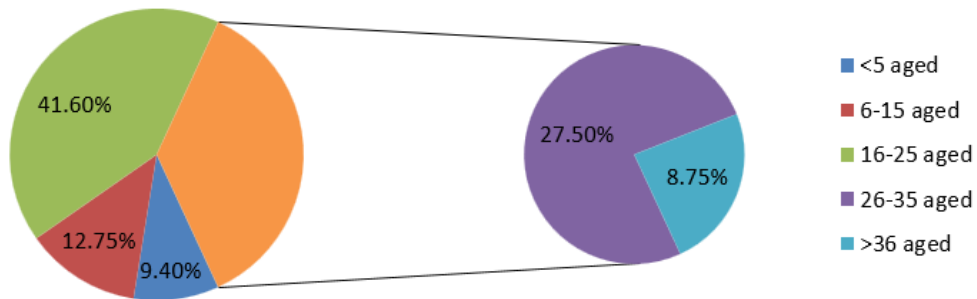


Fig. 2. 2014 E.C HBV positive patients' data via pie chart analysis

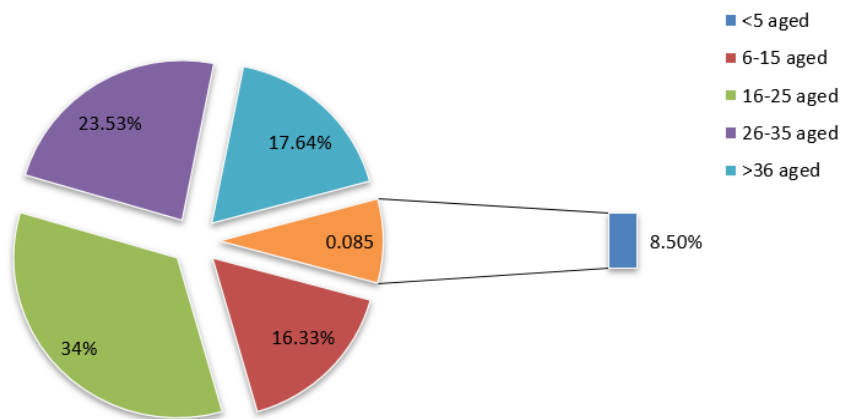


Fig. 3. 2015 E.C HBV positive patients' data via pie chart analysis

5. CONCLUSION

From this study it was obvious to conclude that the spreading status of HBV infection was increasing. Because the study data provided that the status of increment encountered 17.75% among 642 examined patients in 2013 E.C, 18.9% among examined 789 patients in 2014 E.C and 20.1% among 762 examined patients in 2015 E.C were positive with HBsAg. This indicated that both the number of examinations and result obtained were increasing in both with age group and sex group too. The total percentage of data reflected that 18.96% of patients examined were founded HBsAg positive. And total of 2. 53% average increment was seen from 2013 E.C. – 2015 E.C.

As our study revolved to create awareness among people, it was founded with problem minimization via leaflet notes or tract notes within Arencha kebele, which was among the users of Shone primary Hospital. During revolution by our members to create awareness 126 tract note papers were prepared to be spread within society and for people who are unable to read would be invested with issues provided by our members with oral discussion. As 16-35 aged groups and female sex groups were among highly affected groups, they would be highly targeted during revolution at Arencha and Licha kebele.

Generally, the spreading status of HBV disease was highly increasing for previous three successive years (2013 – 2015 E.C). This could be due to lack of knowledge within dwellers of Shone town and other Hospital users, existence of transmission methods like unsafe sexual intercourse, unsafe blood injection (by careless health professionals and other illegal practices), mother to baby (due practices like home deliverance), misuse of drugs after exposition to disease and other causative agents for disease are efficient among Shone town dwellers and other Shone Hospital users and elevated the status of disease. So, the socio-economic development of society would come to decline as the status of this disease had gone on, means it had effect for both individual and social welfare.

6. RECOMMENDATION

Based on the result and data of Shone primary Hospital study we are glad to provide the following recommendations for society groups like health professionals, teachers, Kebele

managers, and other concerning bodies. Even though the problem includes everyone in to its set towards solving social problem of HBV infections, it is prior to head managers, teachers, and professionals as well as students to imprint knowledge with in society because not only specific groups but also the whole society should arise a battle to eradicate HBV infection together. According to the above concerns our study recommends all society groups as follows:

- ❖ Illegal traditional midwives, illegal traditional bone setters, illegal traditional dentists and other illegal agents working with blood and alike activities that can contact blood within individuals should be exposed to government and concerning bodies, aware not to commit without permission, if not exposing them to punishment must be better.
- ❖ Health professionals should use vaccines like Recombivax and antibody like Hepatitis B immune globuline (HBIG) effectively. Because according to Warren, L., (2014) if someone (health professional) are exposed to HBs Ag positive blood injury by accidental needle stick injury, as these drugs are agents that were recommended to medical students, surgeons, dentists and other professional working in contact with blood and sharpen materials.
- ❖ According to Our study also recommends other researchers and concerning bodies to should study further on HBV infection to judge actual result to society.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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