

Prevalence of Chronic Liver Diseases Caused by HBV and HCV in Nigeria in Comparison with European Countries

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Abstract

Background: The prevalence of hepatitis B and C is on the increase globally and is a challenge for health care services worldwide. While there is no national program for hepatitis B and C in Nigeria, the prevalence is fast on the increase and there is the need for it be considered as a public health issue by policy makers. Some studies have suggested that hepatitis B prevalence is at 35 million in Nigeria, more so, vaccination against hepatitis B in Nigeria is lower than many sub Saharan African Countries. It was our aim to get detailed information on the prevalence of both hepatitis B and C in both scientific and grey literature.

Methods: A systematic review was performed by searching both scientific and grey literature published between 2000 and 2015. Inclusion and exclusion criteria were defined and the review process followed published recommendation.

Results: The Literature review identified 500 publications; of these 69 scientific reports and 16 grey literatures met the inclusion criteria. Results show a high prevalence of chronic liver disease in Nigeria. Hepatitis B prevalence was within the range of 2 to 20%, hepatitis C prevalence was in the range of 0.5% to 15% depending on the geographical region.

Conclusions: comprehensive and up-to-date data on the prevalence of hepatitis B and C in different parts of Nigeria are presented. They were found both in peer reviewed and grey literature. The grey literature, therefore, is an important source of information. Based on available data there is a need for a national program on hepatitis B and C so as to reduce the incidence rate and the total burden of liver disease in Nigeria.

Keywords: Prevalence; Nigeria; Hepatitis B; Hepatitis C; Epidemiology

Introduction and Background

Diseases of the liver which last more than six months are considered chronic liver diseases [1]. It involves the destruction of the liver parenchyma leading to fibrosis and cirrhosis. Chronic liver disease is an asymptomatic progressive disease and mostly fatal. They can be categorized as: (a) Viral diseases which include: hepatitis B and C, Cytomegalovirus, Epstein Barr. (b) Alcoholic liver disease and drug induced liver disease from Methotrexate, Amiodarone, Nitrofurantoin and others (c) Metabolic diseases which include: non-alcoholic fatty liver disease, Hemochromatosis, Wilson's disease (d) Autoimmune disorders which include: autoimmune hepatitis Primary biliary cholangitis (primary biliary cirrhosis), primary sclerosing cholangitis.

In the European Union approximately 29 million persons suffer from a chronic liver condition. For example, chronic hepatitis B affects 0.5-0.7% of the population and in the last decade the prevalence of chronic hepatitis C was 0.13-3.26% [2].

Nigeria is the most populated African country with a population of about 170 million people, yet, data on the prevalence of chronic liver disease are scarce. Some studies have suggested that the hepatitis B

prevalence rate is at 35 million in Nigeria [3,4]. Moreover, vaccination against hepatitis B in Nigeria is lower than in many sub Saharan African countries and there is no national program on prevention of chronic liver disease in Nigeria [5]. However, it has been reported that hepatitis B is the most common cause of liver disease in Nigeria [6].

Data on the prevalence of chronic liver disease caused by hepatitis B and C in Nigeria would be very important as this could inform the public health authorities responsible for planning and implementing strategies to effectively tackle and prevent hazards to the health of the public in Nigeria; further, these data would be helpful for the development of programs to increase awareness and health literacy among the public regarding the infectious origin and ways of transmission of chronic liver disease in Nigeria. Considering the number of Nigerians who travel around the world on a daily basis, this is not just Nigeria's public health problem but has a global relevance. The prevalence rate also stands to hamper successes recorded by other countries on preventing chronic liver disease [7].

Therefore, it was the aim of this study to learn about the prevalence of chronic liver disease caused by hepatitis B (HBV) and hepatitis C (HCV) in Nigeria and to compare the data available with those from other countries for better understanding.

Methods

Literature search

The literature search was done during the period from December 2015 to February 2016. For the scientific literature the databases and search engines Pub Med, Medline, Embase were used. Search terms with the MeSH (Medical subject Headings) terms “prevalence of hepatitis B or C was combined with the search terms “in Nigeria” in different combinations. In addition, manual searches of references of publications including reviews were done. Pub Med, Scopus, African journal online, Medline were searched for scientific studies published between 2000 to 2015 and publications that meet the CONSORT statement guidelines - which sets standards on how to report the design, conduct, analysis, and interpretation of such studies were selected [8]. There is no review protocol. The search terms used were: Hepatitis B, Hepatitis C, Prevalence, and Nigeria. We carried out a systematic review guided by the criteria of the PRISMA statement, checking electronic medical data banks for, publications and meta-analyses. Grey literature was defined according to third International Conference on Grey Literature [9] and the following sources were checked with the same search terms: 1. Nigerian Institute of Medical Research, 2. West African Infectious Diseases Institute, World Health Organization. Further searches via the search engines Google (<http://www.google.at>) and Google Scholar (<http://scholar.google.at>); For comparison, we looked for existing reviews, studies and other published data from Europe.

The analysis of the scientific literature was a three step process .The first step was the rejection of duplicates, and the second step was exclusion by screening the title and abstract of papers identified; while the third step was exclusion due to poor content by reading the full text of the paper and reviewing the independently. The exclusion criteria for the grey literature was a three step process also which included reading the ‘Google’ title of the link and the short description followed by reading the full text of the literature.

Study selection

Publications which surveyed the prevalence of chronic liver disease among pregnant women, blood donors, children and of people at community level were identified and included. Three inclusion criteria for relevant literature were defined. First; the content has to deal with prevalence of hepatitis B and C. Second; the subject size has to be 200

and above. Third, the publications were graded and only those that score 3 and above in the grading were included. The grading was based on five criteria of the CONSORT- checklist [10] which includes: 1. Description of trial design, 2. Important changes to methods after trial commencement with reasons, 3. Eligibility criteria for participants, 4. Settings and locations where the data were collected, 5. How sample size was determined etc. The grey literature we used the definition of the Luxembourg convention on grey literature.” Grey literature is that which is produced on all levels of government, academics, Business and industry in print and electronic formats but which is not controlled by commercial publishers” [9] Grey literature includes documents that have not been formally published in a peer-reviewed indexed format. There was no age restriction, however, covariates were included in our analyses such as: social status, sex and region All studies identified were collected and saved via the ENDNOTE-program and handled according to the PRISMA criteria [11] and the CONSORT- criteria [10] . The literature search via electronic searches as well as the review process was carried out by two researchers (BM AND MM).

Data extraction

We extracted data on study year, context and setting, population characteristics, sample size, and prevalence of disease. We tabulated our data and separated them into tables according to the different classification of chronic liver disease. In addition, we separated grey literature from peer review literature.

Analysis

Publications included were read in detail and analyzed with spreadsheet to determine prevalence according to sex, age and regions.

Results

Duplicate papers were rejected and potential scientific papers were identified of which 12 were excluded due to year of publication. 112 were excluded after reading the abstract and title. Furthermore, 7 papers were excluded after reading full text due to less than 200 subjects and poor presentation. We were left with a total of 69 scientific publications and 16 grey literatures. Figure 1 shows the result of the systematic search for publications of interest. Finally, we included a total of 85 publications for detailed analyses.

| Author | location | setting | Type of Subject | Method of Testing | Year of Testing | Grading | Age | No of subjects | Prevalence | |
|------------------------|-------------|--------------|--------------------|-------------------|-----------------|---------|-------|----------------|------------|--------|
| | | | | | | | | | % HBV | % HCV |
| Onyekwere, et al. [12] | Nationwide | Urban /Rural | General Population | ELISA | 2010-2012 | 4 | 20-60 | 5 558 | 6,70% | 0,90% |
| Ezechi, et al. [13] | NIMR, Lagos | Urban | pregnant women | ELISA | 2006-2011 | 5 | 20-50 | 2391 | 4,20% | 1,50% |
| Ladep, et al. [14] | JUTH, Jos | Urban | HIV Patients | ELISA | 2004-2010 | 5 | 15-50 | 19408 | 20,70% | 11,70% |
| Tun, et al. [15] | Lagos | Urban | Drug Injectors | ELISA | 2013-2013 | 4 | 18-50 | 328 | 7,80% | 7,70% |
| Ugbebor, et al. [16] | UBTH, Benin | Urban | pregnant women | ELISA | 2009 -2010 | 4 | 17-38 | 5 760 | 12,50% | 3,60% |
| Diwe, 2013 | IUTH, Orlu | Suburban | HIV Patients | ELISA | 2009-2010 | 5 | 28-48 | 404 | 2,20% | 0,70% |

| | | | | | | | | | | |
|------------------------------|--------------------|----------|-----------------------|-------|-----------|---|-------|------|--------|--------|
| Dirisu, et al. [17] | UBTH, Benin | Urban | Blood Donors | ELISA | 2010-2010 | 5 | 20-40 | 427 | 46,83% | 5,71% |
| Ikeako, et al. [18] | UNTH, Enugu | Suburban | pregnant women | ELISA | 2006-2008 | 5 | 28-32 | 1239 | 3,40% | 2,60% |
| Tremeau-Bravard, et al. [19] | GFC, Abuja | Urban | HIV Patients | ELISA | 2004-2004 | 5 | 20-60 | 443 | 7,90% | 2,30% |
| Ishaku, et al. [20] | FMC, Keffi | Suburban | HIV Patients | ELISA | 2012-2012 | 4 | 20-61 | 200 | 11% | 13,50% |
| Ejeliogu, et al. [21] | JUTH, Jos | Urban | HIV Infected Children | ELISA | 2008-2012 | 5 | 2m-15 | 452 | 12,80% | |
| Kolawole, et al. [22] | LAUTECHTH | Suburban | pregnant women | ELISA | 2011 | 4 | 15-40 | 200 | 16,50% | |
| Erhabor, et al. [23] | UPTH, Rivers | Urban | Blood Donors | ELISA | 2012 | 4 | 18-57 | 1481 | | 0,50% |
| Forbi, et al. [24] | Nasarawa state | Rural | General Population | ELISA | 2013 | 4 | | 519 | | 15% |
| Buseri, et al. [25] | FSPC, Yenagoa | Urban | pregnant women | ELISA | 2014 | 4 | 15-44 | 1000 | 5,30% | 0,50% |
| Okonko, et al. [26] | OMCH, Ibadan | Urban | Children | ICTG | 2015 | 3 | 10-17 | 217 | | 0,90% |
| Oje, et al. [27] | Ekiti State | Mixed | General Population | ELISA | 2016 | | | 2000 | 9,80% | 12,80% |
| Anigilaje, et al. [28] | FMC, Makurdi | Urban | Children with HIV | ELISA | 2008-2012 | 4 | 5-15 | 395 | 7,80% | 2,30% |
| Opaleye, et al. [29] | LAUTECHTH | Urban | Blood Donors | ELISA | 2009 | | | 624 | 13,50% | 3,00% |
| Motayo, et al. [30] | FMC, Abeokuta | Urban | Blood Donors | ELISA | 2013 | | | 305 | 9,80% | 1,30% |
| Esan, et al. [31] | FMC, Ado-Ekiti | Urban | pregnant women | ELISA | 2012-2013 | 4 | 15-44 | 649 | 6,78% | 1,39% |
| Buseri, et al. [32] | LAUTECHTH, Osogbo | Urban | Blood Donors | ELISA | | 4 | 22-42 | 1410 | 18,60% | 6,00% |
| Ejeliogu, et al. [33] | JUTH, Jos | Urban | HIV Infected Children | ELISA | 2008-2012 | 5 | 2m-15 | 372 | | 5% |
| Adewole, et al. [34] | NH, Abuja | Urban | HIV Patients | ELISA | 2008 | 4 | 20-60 | 260 | 11,50% | 2,30% |
| Utoo, et al. [35] | Cross Rivers State | Urban | Pregnant Women | ELISA | 2012 | 3 | 18-38 | 836 | 6,60% | |

Table 1: Publications on the prevalence of Hepatitis B and C in different Nigeria cities.

Table 1 presents the peer review studies on the prevalence of hepatitis B and C in Nigeria. Some of the review literature carried out prevalence studies on both hepatitis B and C while others carried out study on either hepatitis B or C. Most of the studies were carried out in teaching hospitals located in urban areas, however, one cohort study was done in a rural area located in the North central state of Nasarawa and the prevalence of Hepatitis C was found to be 15%, [23] the highest compared to the other studies. Further, the review from Jos, also a North Central state indicates a high prevalence of HBV of 25%

and HCV of 11.7%; [14] together, these studies indicate that in both the urban and rural settings of North central Nigeria there is apparently high prevalence of hepatitis B and C. There was a large cohort study carried out in Lagos among pregnant women with about 2391 subjects [13], among consented HIV patients in Jos with about 19408 subjects [23] and a general studies in Benin teaching Hospital with 5760 subjects [16]. There was also a nationwide study through the six geopolitical zones of the country, it was a large cross sectional study with 5,558 subjects [12].

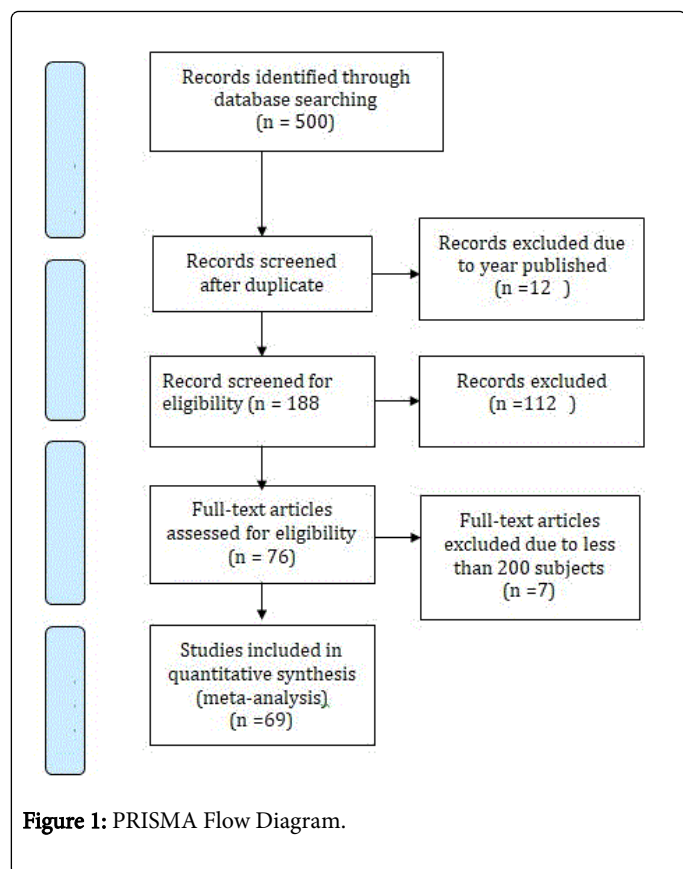
| Author | location | Setting | Type of Subject | Method Testing | Year Testing | Grading | Age | No of subjects | Prevalence | |
|------------------------|--------------------|-------------|-----------------------|----------------|--------------|---------|-------|----------------|------------|-------|
| | | | | | | | | | % HBV | % HCV |
| Adejare, et al. [36] | Private lab ,Lagos | Urban | Blood Donors | ELISA | 2011 | 3 | 21-70 | 315 | 4,80% | 1,50% |
| Hamza, et al. [37] | AKTH, Kano | Urban | HIV Patients | ELISA | 2013 | 5 | 25-50 | 450 | 12,30% | 1,60% |
| Olokoba, et al. [38] | FMC, Yola | Urban | Blood Donors | ELISA | 2007-2008 | 3 | 20-69 | 595 | 2,40% | 2,40% |
| Okwori, et al. [39] | FMC,Keffi | Suburban | HIV Patients | ELISA | 2012 | 3 | 20-61 | 200 | 11% | 2,30% |
| Mbaawuaga, et al. [40] | Benue State | Urban/Rural | General Population | ELISA | 2011-2013 | 2 | 13-60 | 1535 | 12% | |
| Saidu, et al. [41] | UDUTH,Sokoto | Urban | Pregnant Women | ELISA | 2015 | 4 | 16-45 | 384 | 6,51% | |
| Jibrin, et al. [42] | UDUTH, Sokoto | Urban | Sickle Cell Children | ELISA | 2014 | 4 | 1-15 | 300 | 17,30% | |
| Saidu, et al. [43] | Kebbi State | Urban/Rural | HIV Patients | ELISA | 2009 | 3 | | 1950 | 3,40% | |
| Omosigho, et al. [44] | Bida Niger State | Suburban | HIV Patients | ELISA | 2009-2010 | 3 | 20-60 | 250 | 13,20% | |
| Adeleke, et al. [45] | Osogbo, Osun State | Suburban | Pregnant Women | ELISA | 2012 | 3 | 15-35 | 200 | 3% | |
| Isa, et al. [46] | ABUTH, Zaria | Suburban | Students | ELISA | 2013 | 3 | 16-40 | 600 | 9,20% | |
| Isa, et al. [47] | Sokoto Hospital | Urban | General Population | ELISA | 2014 | 3 | 1-50 | 300 | | 2,70% |
| Sheyin, et al. [48] | Kaduna State | Urban | Pregnant Women | ELISA | 2011 | 3 | 20-60 | 200 | | 4,50% |
| Bala, et al. [49] | Hospitals in Kano | Urban | Blood Donors | ELISA | 2010-2011 | 3 | 14-54 | 320 | | 3,40% |
| Akande, et al. [50] | Hospitals in Kano | Urban | Blood Donors/ General | ELISA | 2009 | 3 | 15-45 | 452 | | 1,30% |
| Godwin, et al. [51] | Benue State | Urban/Rural | General Population | ELISA | 2012 | 4 | 15-50 | 388 | | 2,80% |

Table 2: Grey Literature on the prevalence of Hepatitis B and C in different Nigeria cities.

Table 2 shows the results for the grey literature. There were 16 eligible grey literatures mostly from the Northern part of Nigeria and only two publications were large cohorts' studies. Studies among HIV patients in Kebbi had 1950 subjects [43] while a general study in Benue state had 1535 subjects [40]. Four of the grey literatures were studies on pregnant women in different parts of the country, while five of the studies were on blood donors. Three of the grey literatures were Studies on consented HIV patients in Kano, Niger and Abuja. The remaining literatures were general studies though the number of subjects was between 200 and 500.

The flowchart (Figure 1) is showing the search strategies and the exclusion criteria used to locate the relevant scientific articles in this review.

Table 3 shows there are nine publications on prevalence of HBV and HCV among different European countries. Netherlands had a low HBV prevalence of 0.4% [2] while Belgium had a low HCV prevalence of 0.12% [52]. Romania had the highest prevalence of HBV prevalence of 5.6% [56] and also the highest prevalence of HCV of 3.4% [59]. All the studies were general population studies with large numbers of participants and they were carried out by testing the HBs antigen and anti HCV in serum and saliva respectively.



| Author | country | Subject Type | Method of Testing | Prevalence | |
|-------------------------|-------------|----------------------|-----------------------|------------|-------|
| | | | | % HBC | % HCV |
| Quoilin, et al. [52] | Belgium | general population | | 0,66% | 0,12% |
| Meffre, et al. [53] | France | general population | HBs antigen in saliva | 0,65% | 0,65% |
| Baaten 2004 | Netherlands | general population | HBs antigen in saliva | 0,40% | 0,60% |
| Zacharakis, et al. [54] | Greece | general population | HBs antigen in serum | 3,40% | |
| Fabris, et al. [55] | Italy | GP in northern Italy | HBs antigen in serum | 1% | |
| Voiculescu, et al. [56] | Romania | GP in SE Romania | HBs antigen in serum | 5,60% | |
| Salleras, et al. [57] | Spain | GP in Catalonia | HBs antigen in serum | 0,70% | |
| Cozzolongo, et al. [58] | Italy | GP in southern Italy | HBs antigen in serum | | 2,60% |
| Gheorghe, et al. [59] | Romania | general population | HBs antigen in serum | | 3,23% |

Table 3: Prevalence of Hepatitis B and C in different European countries.

Discussions

This report presents the most comprehensive data on the prevalence of hepatitis B and C in Nigeria, based on a systematic search of relevant peer reviewed and grey literature. The results show a high prevalence of hepatitis B and C disease in Nigeria: Hepatitis B prevalence was within the range of 2 to 25%, hepatitis C prevalence was in the range of 7% to 15%.

Situation in Nigeria

Evidence based studies show that the prevalence depends on a range of factors such as cultural practices and traditions. The prevalence of hepatitis B range from 2 to 25%, with the north central part of the country having higher cases. This may be related to some cultural practices such as drinking from same cup, tribal marks or the practice of circumcision. The prevalence of hepatitis c range from 0.7 % to 15%, with the highest prevalence also from the north central state of Nasarawa [61-64].

Comparison to other countries

The prevalence of hepatitis B was high when compared to European countries, with the exception of Greece and Romania which has prevalence rate of 3.4% and 5.6% respectively. Based on data collected the only states in Nigeria with low prevalence were Imo with rate of 2.2% (Table 1) located in the south eastern region, Yola located in the northern part also had a low rate of 2.4% (Table 2).The states of Benue, Nasarawa, Plateau, and Abuja had and alarming high rate when compared to other countries [65-67].

The prevalence of hepatitis also followed a similar trend along the regions, with the north central states of Nasarawa, Plateau showing alarmingly high prevalence. Hepatitis C prevalence among other countries was low with the exception of Italy having a rate of 2.6% (Table 3). The southern states of Imo, Port Harcourt and Bayelsa 0.7%, 0.5% and 0.5% respectively (Table 1), the only states with rate that are close to the European countries on our list [68].

There is an evident healthcare inequity within the North central states because they have a staking high level of prevalence compared to other regions of the country. The south-south zone follows the north central zone except for Rivers and Bayelsa states which have a lower rate within the south-south zone [69].

There is an urgent need for action to curtail the prevalence of rate as seen in our review. A treatment has been developed for hepatitis C though very expensive; there is a need for the government to intervene in providing these drugs at affordable prices to infected victims. More so, more work need to be done to intensify and broaden the scope of vaccination for hepatitis B to include the general population so as to prevent further spread of the disease. Lessons should be learned and adopted by the government on how countries in Europe have successfully tackled and lowered the prevalence within their countries. Education of the public and change of old traditional practices that pose as risk should be introduced at all levels of healthcare [70].

The limitations of this systematic Review are the reliance on already published research papers. More so, the grey literatures were mostly of low grading because they were not written according to consort statement.

Conclusions

There is a high level of prevalence of hepatitis B and C in Nigeria especially among HIV patients, Children, Pregnant women and blood donors. Considering the fact that 80% of hepatocellular carcinoma globally is as a result of hepatitis B and C this may further increase the prevalence of hepatocellular carcinoma.

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Competing Interest

There is no conflicting interest.

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