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PREVALENCE OF ALCOHOLIC LIVER DISEASE AMONG FEMALES RESIDENT IN PORT HARCOURT, RIVERS STATE

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ABSTRACT

Introduction: This study was conducted to determine the prevalence of alcoholic liver disease in Port Harcourt. **Methodology:** It was conducted in the University of Port Harcourt Teaching Hospital, among patients that presented at the Out-Patient Department. A total of 160 females participated in the study, employing a purposive, cross-sectional approach and a structured questionnaire, and four research objectives and questions. **Results:** The respondents were mainly aged between 31-45 years, 101(63.13%), mostly married, 96(60.0%) and singles, 61(38.12%). Knowledge of liver disease shows that 138(88.1%) have heard about it, 115(84.1%) heard from health facility and 11(8.7%) from school. Also, 26(18.8%) respondents knew how it is treated, with 14(53.9%) and 8(30.8%) knowing that it can be treated in the hospital and traditionally respectively, it was mostly managed in the hospital, 12(63.2%) and traditionally, 6(31.6%), and 138(88.1%) know the causes, while 102(77.9%) knew the causes as infections, while 4(2.9%) knew that alcoholic liver disease can be caused by certain foods. The observations of this study agree and disagree with other studies in certain aspects. The prevalence of liver disease was 149(93.1%) normal values of aspartate, with 5(3.1%) having low values, 157(99.1%) had normal values for alanine amino transaminase, normal circulating gamma GT was 156(98.7%), while the circulating total protein was normal for 131(81.9%) respondents, followed by 23(22.3%) that was high and similar for creatinine, normal was most frequent, 151(94.3%) and high circulation values was the least, 3(1.9%). Finally, the relationship between gender and age to the liver disease markers revealed age (0.793) and sex (0.591) were not statistically significant for the aspartate, age (0.000) was significant and sex (0.217) non-significant for ALT, and age (0.830) and sex (1.52) not statistically significant for gamma T, while both age (0.993) and sex (0.777) are statistically not significant for ALP, and is similar for total protein (age; 0.793 and sex; 0.639), but age (0.000) is statistically significant for creatinine, but not for sex (0.997). **Conclusion:** The study observed high knowledge of alcoholic liver disease among participants in the study, with most biomarkers for liver diseases being non-statistically significant in relation to age and gender, but for aspartate and total protein which strongly correlated with the age of the respondents. However, the prevalence of liver disease is low (8.1%) of the population and this may be attributed to factors such as poor healthcare-seeking attitude among the residents and effective diagnostic tools to detect the anomaly in the liver, especially, at the earliest stages of the disease condition.

KEYWORDS: knowledge, prevalence, liver disease, enzymes, biomarkers.

INTRODUCTION

Alcoholic liver disease, sometimes called, alcohol-related liver disease, is liver dysfunctions and their clinical manifestations that originate from prolonged, excessive consumption of alcohol. It can be defined as the damages done to the liver and its functions, due to alcohol overconsumption over a prolonged duration (Kong *et al*., 2019). The dysfunctions include; fatty liver, alcoholic hepatitis, chronic hepatitis and liver fibrosis or cirrhosis (O'Shea *et al*., 2010).

Alcohol liver disease (ALD) ranks second as the most cause of deaths among humans globally (Poznyak & Rekve, 2018). In industrialized climes, ALD is the most common cause of liver disease. While fatty liver (steatosis) is a common symptom in individuals that consume large volume of alcohol over a prolonged period of time, the condition is usually transitory and can be reversed (O'Shea *et al*., 2010). Kong *et al*. (2019) posits that approximately 90% of individuals that consume high volume of alcohol over a prolonged time

have the tendency of developing fatty liver, while 25% develop severe alcoholic hepatitis and 15% develop liver cirrhosis in their life time (Basra, 2011). At the moment, a clear understanding of the pathogenesis is unclear, due to combination of manifestations that implicate several cells and systems of the body, such as the immune cells and adipose tissues, in addition to genetic variability, and this is similar for its clinical diagnosis (Kong *et al*., 2019).

Although ALD is a severe disease that affects substantial number of people in different parts of the world, there is a challenge of awareness regarding the diseases, and coupled with poor knowledge of the risk factors to its aetiology, there is tendency of great human-capital decline, which is in addition to other medical conditions, such as HIV, that threatens to decimate the human population. Certain factors, such as infections, environment, lifestyle, genetics and other unknown causes have continued to affect the liver and worked in tandem with increased alcohol consumption to negatively affect the course and function of the liver, thus, resulting in disease conditions over the course of time. However, knowledge of liver physiology brings to understanding that approximately 80% of consumed alcohol is metabolized in the liver for detoxification.

The proposed pathway, according to Longstreth *et al*. (2009) stipulates that chronic consumption of alcohol leads to secretion of pro-inflammatory cytokines such as tumor necrosis factor- alpha, interleukins 6 and 8, oxidative stress, lipid peroxidation and acetaldehyde toxicity. The aetiopathogenesis of ALD implicates induction of stress in the liver, leading to release of reactive oxygen species (ROS) from prolonged alcohol consumption, which further results in the accumulation of these alcohol metabolites (ROS) in the liver (Galicia-Moreno & Gutierrez-Reyes, 2014). These lead to inflammation, apoptosis and subsequent fibrosis of the liver cells, hepatocytes. Furthermore, the reason why ALD occurs less frequently in humans could be attributed to the high capacity of hepatocytes to regenerate and the ability of the liver to sustain its normal function even when up to 75% of hepatocytes are dead. This indicates strong associated between alcohol consumption and the role of the liver in metabolism. Thus, in excessive, prolonged alcohol intake, the liver constantly works to metabolize the substance, and this dangerous precedence affects the hepatocytes, which tends to succumb to the excessive demand by the body to detoxify the substance.

For every disease condition, effective diagnosis is of crucial underlying importance. In this case of alcoholic liver disease, the early stage is devoid of physical findings, and if any, they are subtle. The symptoms usually appear at advanced stages of the liver disease. Usually the manifestations of liver disease could be categorized into early and late stages. The early stage is usually diagnosed during routine medical examination, with the observation of elevated liver enzymes. These can also be group into macroscopic and microscopic observations. Macroscopic observations are associated with steatosis (fatty liver) with associated inflammation in biopsy specimens, while the microscopic observations, which are similar to nonalcoholic fatty liver disease, can be seen in histologic sections. Fatty liver may resolve on its own, with the discontinuation of alcohol use. The laboratory investigation of ALD involves two enzymes; aspartate aminotransferase (AST) and alanine aminotransferase (ALT). Basically, the ratio of the enzymes will be greater than 2:1. Laboratory findings include; macrocytosis of erythrocytes, elevated concentrations of gamma glutamyl transferase (GGT), alkaline phosphatase and bilirubin. The commonly employed laboratory diagnosis is the liver function test, which will reveal five to eight times more aminotransferase in the blood of ALD (Kong *et al*., 2019).

In the earliest stages, the dysfunction presents as jaundice, fever, hepatomegaly, hepatic encephalopathy, variceal and ascites accumulation. In some individuals fatty liver can be asymptomatic (McCollough & O'Connor, 1998). The symptoms, though overlapping for other disease conditions, serve to differentiate a disease condition from others. Clinically, they serve as differentials towards making a definitive diagnosis. For ALD, the symptoms include fatigue, obesity, bloating, loss of appetite, nausea and vomiting (Li *et al*., 2011).

Ladep and Taylor-Robinson (2007) reported that the severity of liver damage is usually mild in children and infants, which could be due to regenerative process at that stage of life, while it is usually severe or progresses to the severe (fulminant) form as the individual advances in age and leads to liver cirrhosis or hepatocellular carcinoma (HCC). In Africa and Asia, HCC due to HBV accounts for approximately 80% of liver disease, the leading cause of deaths from liver disease (Zhu *et al*., 2016), with 5%-10% of adults being chronic carriers, while the disease resolves in other cases (Emechebe *et al*., 2009). Also, about 25% of the chronic carriers of HBV die from liver-associated complications, with a few carrying the infectious agents for a lifetime and clearing the virus from their system at varying intervals (Idris & Adejumo, 2020). The increased prolonged consumption of alcohol is attributed to other ailments that are associated with the liver, but equally fatal, as when it affects the liver. For instance, it causes cancers of the oropharynx, colon, oesophagus, rectum and female breasts (Seitz & Stickel, 2007), cardiovascular diseases (Fernandez-Sola, 2005) and neuropsychiatric disorders (Foulds *et al*., 2015).

It has been observed that hepatocellular carcinoma (HCC) accounts for 42.5% while those of liver cirrhosis accounted for 21.1% of the liver-disease associated mortality in Nigeria and is the commonest cause of mortality associated with the liver among the middle-

aged and elderly (Ndububa *et al*., 2001). It is observed that most studies regarding HCV in Nigeria are not community based (Koate *et al*., 2005; Halim & Ajayi, 2000), thus, making it difficult to ascertain the exact prevalence of the disease. Available reports have it that the prevalence of HCV is 2.9%-10.3% (Ejele *et al*., 2006; Koate *et al*., 2005; Lesi & Kehinde, 2003; Halim & Ajayi, 2000).

The global mortality of liver disease continues to grow steadily, with approximately 1 million in 2010, which is about 2% of the total mortality of the disease (Mokdad *et al*., 2014). It is the same for liver-related disorders of other organs in the human body, which outscores its previous number over time (WHO, 2012), with 60%-80% of liver associated deaths in the European Union linked to excessive consumption of alcohol (Sheron, 2016), while 87% of deaths in Finland are associated to disorders of the liver that arise from excessive alcohol consumption over time (Stickel *et al*., 2017).

Hepatitis B virus is one of the prominent diseases of the human race. Globally, the virus has infected over 2 billion people, with more than 350 million chronic infections and posing a risk of death from its progression to cirrhosis or carcinoma, while about 1 million succumb to death occasioned by it annually (WHO, 2000). In endemic areas, where there are about 5% of carriers, the infection is mainly transmitted either perinatally or via vertical transmission (Wright, 2006).

To this end, it is important to mention that there are certain factors that elicit the development of ALD in humans. Some of the factors, according to O'Shea *et al*. (2010), Mandayam *et al*. (2004) and Menon *et al*. (2001) include; the quantity of alcohol consumed, pattern of alcohol consumption, gender, Hepatitis C virus infection, genetic, Iron overload and kind of diet. Also worrisome, is the poor record-keeping nature in some climes, which has hampered the possibility of ascertaining the exact magnitude of the menace, which has resulted in deaths that are usually attributed to other causes. It is thus, important to determine the prevalence of alcoholic liver disease among female residents of Port Harcourt, Rivers State, Nigeria, to provide a picture of the incidence, as well as, aiding the diagnosis and management of the disease and distinguish it from other forms of liver impairment among females.

METHODOLOGY

The study was conducted in the University of Port Harcourt Teaching Hospital (UPTH), a tertiary health facility serving treatment of patients, teaching of medical students and other allied medical professions, medical, biomedical and public health research, and a referral hospital for both primary and secondary health care facilities within Rivers State and other neighbouring states. It is a descriptive, cross-sectional study among females that present at the Endocrine unit of the Medical Out-patient Clinic, MOPC, of the UPT from January 4 to February 10, 2021. A structured, self-administered questionnaire with four sections was employed in this study. The sections are socio-demographic, knowledge, prevalence and attitude towards management of liver disease, while the sample size is 160, obtained from a previous study Nimat and Adedayo (2020) and Ethical approval obtained from the Legal Department of the UPTH and the Department of Internal Medicine of the same facility, consent of the participants.

RESULTS

Table 1: Socio-demographic characteristics of the respondents.

Variables	Frequency (n)	Percent (%)
Age (years)		
18-30	34	21.25
31-45	101	63.13
46-60	23	14.37
61-75	2	1.25
Marital status		
Married	96	60.0
Single	61	38.12
Widowed	3	1.88

Table 1 above shows that the respondents were mostly aged between 31-45 years, 101(63.13%), followed by 18-30 years, 34(21.25%) and 46-60 years, 23(14.37%), while the least were aged 61-75 years, 2(1.25%) and were mostly married, 96(60.0%), while the singles were 61(38.12%) and widowed were 3(1.88%).

Table 2: Respondent's knowledge of alcoholic liver disease.

Variables	Frequency (n)	Percent (%)
Have you heard of liver disease?		
Yes	138	86.25
No	18	13.75
If yes, how did you hear about it (n=138)		
Social media	4	2.9
Health facility	115	83.2
Church/mosque	3	2.2
School	11	8.0
Friends	3	2.2

Others	2	1.5
Do you know how liver disease is treated? (n=138)		
Yes	26	18.8
No	112	81.2
If yes to question above, how is it treated?		
In the hospital	14	53.9
Traditional	8	30.8
Prayer/spiritual	3	11.5
Others	1	3.9
Have you had/known anyone that had liver disease?		
Yes	19	11.9
No	141	88.1
If yes, how was it managed? (19)		
Hospital	12	63.2
Traditional	6	31.6
Prayers	1	5.3
Others	-	
Do you know the causes of liver disease(s)?		
Yes	138	86.1
No	22	13.9
If yes to question above, what are the causes? (138)		
Infections	102	73.9
Foods	4	2.9
It just occurs	23	16.7
Do not know	9	6.5

Table 2 above is the respondents' knowledge of alcoholic liver disease. It shows that 138(86.25%) have heard about it, majority, 115(83.2%) heard from a health facility, 11(8.0%) from school and 3(8.0%) from friends. However, only 26(18.8%) knew how to treat the disease, with 14(53.9%) and 8(30.8%) knowing that it can be treated in the hospital and traditionally respectively, while 19(11.9%) either know someone that had had the disease or had been affected themselves, and it was mostly managed in the hospital, 12(63.2%) and traditionally, 6(31.6%), just as 138(86.1%) know the causes of alcoholic liver disease, with 102(73.9%) and 23(16.7%) knowing that the causes are infections and it just occurs respectively, while 4(2.9%) knew that it can be caused by certain foods.

Table 3: Some liver parameters among the respondents.

Variables	Frequency (n)	Percent (%)
Aspartate (8-42U/L)		
Low	5	3.1
Normal	149	93.1
High	6	3.8
Alanine amino transaminase (7-49U/L)		
Low	2	1.3
Normal	157	99.1
High	1	0.6
Alanine phosphatase (40-129U/L)		
Low	1	0.6
Normal	128	80.0
High	31	19.4
Gamma T (5-78U/L)		
Low	-	
Normal	156	98.7
High	2	1.3
Total protein (g/dl)		
Low	6	3.8
Normal	131	81.9
High	23	23.3
Creatinine (59-112U/L)		

Low	6	3.8
Normal	151	94.3
High	3	1.9

Table 3 above shows that 149(93.1%) respondents had normal values of aspartate, being the highest, with 5(3.1%) having low values, less than 8U/L, while 157(99.1%) had normal values for alanine amino transaminase, with the least being 1(0.6%). For alanine phosphatase, the most was normal, 128(80.0%), followed by high, 31(21.4%), just as gamma T had normal circulating value as the most occurring, 156(98.7%), with none for low circulating value. The study also observed that the circulating total protein was mostly normal, 131(81.9%), followed by high, 23(22.3%), which is similar for creatinine in which normal was the most frequent, 151(94.3%), while the least was high circulation, 3(1.9%).

Table 4: Relationship between age/sex and hepatic parameters.

Variables		Df	Chi-square
Aspartate	Age	84	0,793
	Sex	2	0.591
Alanine amino transaminase	Age	84	0.000
	Sex	2	0.217
Gamma GT	Age	42	0.830
	Sex	1	1.52
Alanine phosphatase	Age	84	0.993
	Sex	2	0.777
Total protein	Age	84	0.793
	Sex	2	0.639
Creatinine	Age	84	0.000
	Sex	2	0.997

The relationship between gender and age to the assayed parameters were investigated and presented in table 4 above. The result shows that age (0.793) and sex (0.591) were not statistically significant for the circulating level of aspartate, with age (0.000) significant and sex (0.217) non-significant for alanine amino transaminase, while age (0.830) and sex (1.52) were not statistically significant for gamma T. The study also reports that both age (0.993) and sex (0.777) are non-statistically significant for alanine phosphatase, and is similar to that of total protein (age; 0.793 and sex; 0.639), but age (0.000) is statistically significant for creatinine, while it is not for sex (0.997).

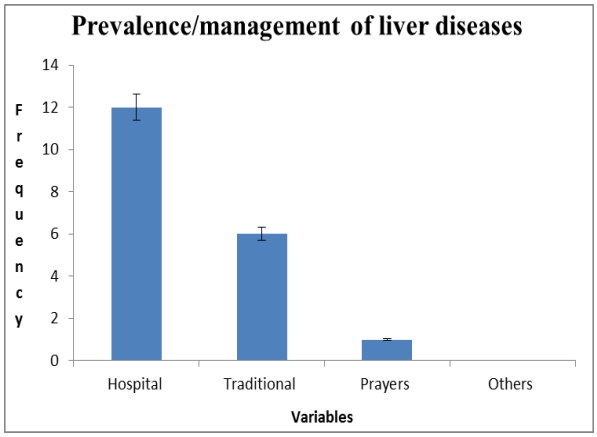

Figure 1: Statistical significance of prevalence to management of liver disease.

The tabulated value was 2.5, while the calculated value is 3.3. Since the calculated is higher than the tabulated value, there is no statistical significance between the prevalence of alcoholic liver disease and its management in the study area. This observation is indicative of delayed presentation for cases of liver diseases by patients, and this in turn leads to poor management.

DISCUSSION

Knowledge of alcoholic liver disease

The knowledge of liver disease in this study shows that 138(88.1%) have heard about it, majority, 115(84.1%) heard from a health facility, 11(8.7%) from school and 2(1.0%) each from friends and other sources respectively. This finding agrees with the finding of Kong *et al.* (2019), but does not agree with that of Menon *et al.* (2001) who reported poor knowledge of liver disease among their respondents, 39%. This study reports that only 26(18.8%) knew how to treat the disease, with 14(53.9%) and 8(30.8%) knowing that it can be treated in the hospital and traditionally respectively, while 19(11.9%) either know someone that had had the disease or had been affected themselves, and it was mostly managed in the hospital, 12(63.2%) and traditionally, 6(31.6%), just as 138(88.1%) know the causes of alcoholic liver disease, with 102(77.9%) and 23(15.9%) knowing that the causes are infections and it just occurs respectively, while 4(2.9%) knew that alcoholic liver disease can be caused by certain foods. The observations of this study agree and disagree with other studies in certain aspects. For instance, the aspect that deals with the knowledge of the causes of alcoholic liver diseases agree with the findings of Kong *et al.* (2019), Longstreth *et al.* (2009) and Mandayam *et al.* (2004) but disagrees with those of Miller *et al.* (2011), Breitkodf *et al.* (2009) and Rao (2009) The findings that concurred could be as a result of similarity in environment and level of awareness among the participants. The level of awareness among the

participants could also be due to their willingness to be informed, the role played by government and other health institutions and individuals towards their health, as well as, wellbeing.

Prevalence of alcoholic liver disease

The prevalence of an incidence can be associated with how often parameters that are related with occurrence are observed. Typically, for alcoholic liver disease, the frequency at which its indicating parameters are high in the circulation or the causative organism is present in samples is a pointer to how frequently the disease condition occurs. The prevalence of liver disease in this study was investigated on the basis of some liver enzymes, that serves as markers and showed that 149(93.1%) respondents had normal values of aspartate, being the highest, with 5(3.1%) having low values, less than 8U/L, while 157(99.1%) had normal values for alanine amino transaminase, with the least being 1(0.6%), which had higher circulating value of the enzyme. These findings are in concordance with findings of Gao and Bataller (2011), but not with that of Breitkodf *et al*. (2009) in a related study. The difference in the findings could be attributed to difference in culture, environment and lifestyle among the participants of the respective studies. The result for alanine phosphatase shows that the most was normal, 128(80.0%), followed by high, 31(21.4%), just as gamma-GT had normal circulating value as the most occurring, 156(98.7%), with none for low circulating value. These observations also agree with the findings by Breitkodf *et al*. (2009) on the individual liver disease markers. It was also observed that circulating total protein was mostly normal, 131(81.9%), followed by high, 23(22.3%), which is similar for creatinine in which normal was the most frequent, 151(94.3%), while the least was high circulation, 3(1.9%) and the findings corresponding with the findings of Kong *et al*. (2019) and Breitkodf *et al*. (2009) in two distinct studies from different climes, and pointing to the fact that where ever a study is conducted, it is only the existence of similar risk factors that can enthrone the occurrence of a particular disease condition, but for cases of deviation in the genetic and racial composition among individuals.

Relationship between age and sex to liver parameters

The relationship between gender and age to the liver disease markers reveals that age (0.793) and sex (0.591) were not statistically significant for the aspartate biomarker, with age (0.000) being significant and sex (0.217) non-significant for alanine amino transaminase, while age (0.830) and sex (1.52) were not statistically significant for gamma GT. The finding of statistical significance with respect to ALT in this study is in agreement with the findings of Seth *et al*. (2011) and Parola and Robino (2001). A possible explanation to this association can be attributed to the fact that as individuals grow older, they tend to be more conscious about their health and avoid things that will jeopardize it, thus majority of the respondents, being adults and ageing population are better enlightened and cautious of good health. It could also be due to the fact that lifestyle and environment plays a role towards their health consciousness. It was further observed in this study that both age (0.993) and sex (0.777) are non-statistically significant for alanine phosphatase, and is similar to that of total protein (age; 0.793 and sex; 0.639), but age (0.000) is statistically significant for creatinine, while it is not for sex (0.997). The observation of statistical significance in this study is in tandem with the report of Stickel *et al*. (2017) and Abdelmegeed *et al*. (2013) for age and could have emanated from the fact earlier mentioned. However, the findings from this study contradict those of Teschke (2018), Chacko and Reinus (2016) and Torruellas *et al*. (2014).

SUMMARY

This study was conducted to determine the prevalence of alcoholic liver disease in Port Harcourt. It was conducted in the University of Port Harcourt Teaching Hospital, among patients that presented at the Out-Patient Department. A total of 160 females participated in the study, employing a purposive, cross-sectional approach and a structured questionnaire, and four research objectives and questions. The respondents were mainly aged between 31-45 years, 101(63.13%), mostly married, 96(60.0%) and singles, 61(38.12%). Knowledge of liver disease shows that 138(88.1%) have heard about it, 115(84.1%) heard from health facility and 11(8.7%) from school. Also, 26(18.8%) respondents knew how it is treated, with 14(53.9%) and 8(30.8%) knowing that it can be treated in the hospital and traditionally respectively, it was mostly managed in the hospital, 12(63.2%) and traditionally, 6(31.6%), and 138(88.1%) know the causes, while 102(77.9%) knew the causes as infections, while 4(2.9%) knew that alcoholic liver disease can be caused by certain foods. The observations of this study agree and disagree with other studies in certain aspects.

The prevalence of liver disease was 149(93.1%) normal values of aspartate, with 5(3.1%) having low values, 157(99.1%) had normal values for alanine amino transaminase, normal circulating gamma T was 156(98.7%), while the circulating total protein was normal for 131(81.9%) respondents, followed by 23(22.3%) that was high and similar for creatinine, normal was most frequent, 151(94.3%) and high circulation values was the least, 3(1.9%). Finally, the relationship between gender and age to the liver disease markers revealed age (0.793) and sex (0.591) were not statistically significant for the aspartate, age (0.000) was significant and sex (0.217) non-significant for ALT, and age (0.830) and sex (1.52) not statistically significant for gamma GT, while both age (0.993) and sex (0.777) are statistically not significant for ALP, and is similar for total protein (age; 0.793 and sex; 0.639), but age (0.000) is statistically significant for creatinine, but not for sex (0.997).

CONCLUSION

The study observed high knowledge of alcoholic liver disease among participants in the study, with most biomarkers for liver diseases being non-statistically significant in relation to age and gender, but for aspartate and total protein which strongly correlated with the age of the respondents. However, the prevalence of liver disease is low (8.1%) of the population and this may be attributed to factors such as poor healthcare-seeking attitude among the residents and effective diagnostic tools to detect the anomaly in the liver, especially, at the earliest stages of the disease condition.

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