Original Article

Seroprevalence of Hepatitis B&C and its Association with Stroke in Local Population

Amsal Amjad, Benash Altaf, Farah Amir Ali, Mirza Aroosa Beg

ABSTRACT

Background: Pandemics of viral origin are spreading at alarming rate worldwide. Acquired immune deficiency syndrome (AIDS) caused by human immunodeficiency virus (HIV), hepatitis B and Hepatitis C (HCV) are lethal threats to the human health. HCV remains a serious issue due to long-term consequences of the infection. HCV infection has a role in the development and progression of carotid atherosclerosis and stroke due to altered lipid metabolism. Association of hepatitis with stroke is still hypothesized due to conflicting results documented by various researchers. Aim of this study is to explore association of HBV and HCV with stroke as the prevalence of this issue in Faisalabad is 21% which is higher than other regions of Punjab Pakistan.

Methods: This is a hospital-based retrospective study from July 2018 to September 2018 at a private hospital of Faisalabad. It comprised of 226 subjects. After taking ethical approval from the ethic research committee, data was retrieved from centrally database medical records. Data was transported to SPSS 21 for analysis. Frequency and percentages were obtained for categorical variables. Association between hepatitis and stroke was tested by Chi square and logistic regression to obtained odd ratio. P value≤0.05 was considered as significant.

Results: Mean age of the studied population was 51.2 ± 27.03. 38.5% and 4% of the studied population had hepatitis C and B respectively. HCV was significantly associated with stroke (P=.005*)

Conclusion: HCV is more prevalent viral infection in local population and is the independent risk factor for stroke

Key Words: HBV ,HCV, Stroke, Association, lipid metabolism.

Introduction

Burden of lethal viral infections are continuously increasing at an alarming rate all over the world. World health organization (WHO) executive board estimated that 1 Million mortalities each year are attributed to viral hepatitis which is 2.7% of the total deaths occurring in the world.[1] 11.5% cases of active hepatitis C (HCV) was reported among the general adult Pakistani population which is expected to increase in coming decades mainly due to widespread use of unsafe medical procedures.[2,3] Hepatitis is caused by one of the five known viruses (A,B,C,D,E) which primarily infects the liver. Hepatitis A and E are common in regions where water and sanitation problems exist like Pakistan and Bangladesh.[4] However, HBV and HCV infections are most commonly found in subjects receiving blood transfusions and organ transplantations. It is also prevalent among the health care providers who sustain accidental needle pricks while caring these patients. According to the latest figure, about 170 million people are the victim of this lethal virus and are the leading cause of liver transplantation. 0.85-5.5% of the cases with HCV infection are reported by previous studies.[5] HCV is belongs to a family known as *Flaviviridae* with an approximately 9.6 kb single-stranded, positive sense RNA genome.[6] It can be diagnosed by either checking for viral load through the PCR or by looking for the antibodies been produced against the virus itself. Unfortunately, no vaccine is available for this rapidly spreading virus. Important issue regarding this virus is that it can easily spread from person to person through infected blood and instruments. Perhaps, this is one of the reasons why this bug is based worldwide. It is important to highlight un-documented cases especially in third world countries where still many of the cases are left unnoticed.[7] About 80% of the infected subjects develop chronic infection leading to liver cirrhosis. Hepatitis 'C' virus also has extra hepatic manifestations like type II diabetes, autoimmune thyroiditis, cardiovascular and cerebrovascular diseases most commonly ischemic stroke. Steatosis, and oxidative stress due to inflammation provoking the carotid atherosclerosis and plaques in most of the cerebral vessels are the contributing factors for the ischemic stroke.[8,9] Steatosis leading to plaque formation

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is most probably due to the fact that virus itself require fat for its replication and virion production by altered metabolism, leading to decrease reabsorption of fat and subsequent hyperlipdimia.[8] This altered lipid metabolism by HCV virus is the most probable explanation of pathophysiology for stroke in HCV infected patients.[10] Strong supportive evidences are available showing the association of HCV with stroke but some studies did not find this association. Documentation concerning link of HCV and stroke are still controversial so there is need to explore this relationship.[12] Current study is aimed to focus on the association of HCV and HBV with ischemic stroke. In support of this, recent researches are available showing cerebrovascular and cardiovascular diseases are commonest ailments affecting our community and subsequently leading to morbidity and mortality. Hence, this emerging issue is contributing a great burden on our society.[13] However, it is preventable and 95% of chronic infection can be cured by using the standard protocol and right treatment guidelines.[14]

Material & Methods

This is a hospital-based retrospective study of three months from July 2018 to September 2018 at a private tertiary care hospital in Faisalabad. After taking ethical approval from the ethic research committee of the concerned hospital and permission from head of respective ward, data was requested to retrieve from centrally database medical records with the cooperation of IT department of the hospital. However, informed consent of the patient was not needed as including patient's data was anonymized and decoded.[11] Our inclusion criteria was patients admitted in medical ward in this duration with either stroke or diagnosed HBV and HCV. Subjects with other diseases were excluded. Total of 226 patients were admitted with HBV, HCV and stroke in this duration, which was the targeted population of present study. Data of the subjects of interest concerning age, gender and diagnosis was sorted out on excel and transferred to SPSS 21. It was analyzed for frequency and distribution of Hepatitis and stroke, Chi square test (X^2) was performed to assess the association of HCV and HBV with stroke with 95% confidence interval. To estimate the relative risk, odd ratios were determined by logistic regression analysis. P value $\leq$ 0.05 was considered to be significant.

Results

Current study comprised of 226 subjects from a private tertiary care hospital of Faisalabad. Mean age was found to be 51.2 ± 27.03. Out of 226 subjects 50.4% were males and 49.6% were females, showing that male presentation in medical ward was more than females. Figure 1 is showing the frequencies of HBV, HCV and stroke. 38.5% and 4% of the studied population was hepatitis C and B seropositive respectively. Results reveal that hepatitis C was more prevalent as compared to hepatitis B. Taking into account for stroke, 76.5% of patients were reported. Figure 2 is indicating that the 79.3% of hepatitis C patients were also affected by stroke. X^2 test shows significant association of hepatitis C with stroke. Odd ratio of 1.29 (p value 0.005*, 95% CI) for anti-HCV seropositive patient is showing that these patients have 1.29 times more risk for developing stroke in contrast to seronegative subjects. Figure 3 is showing that the stroke is also found in 66% of the seropositive HBsAg patients; however, this association was not statistically significant, most probably due to smaller number of hepatitis B patients in our study (p value 0.480). This study also revealed that the hepatitis C and B as well as stroke are more prevalent among females in contrast to males. Difference concerning stroke was statistically significant but was not statistically significant in respect to hepatitis among the gender. (Table 1) .

Table 1: Distribution of Hepatitis and Stroke among Gender (N=226)

Gender	Hepatitis C (anti HCV)		Hepatitis B (HBsAg)		Stroke
	Seropositive Frequency N (%)	Seronegative Frequency N (%)	Seropositive Frequency N (%)	Seronegative Frequency N (%)	Frequency N(%)
Male (114)	42(36.8)	72(63.2)	3(2.6)	111(97.4)	79(69.3)
Female (112)	45(40.2)	67(59.8)	6(5.4)	106(94.6)	94(83.9
P values	0.33		0.68		0.012*

Proportions are compared by chi-square test. P value ≤ 0.05 was considered to be significant.

Figure1:Frequencies and Percentages of Hepatitis and Stroke among the hospitalized patients (N=226)

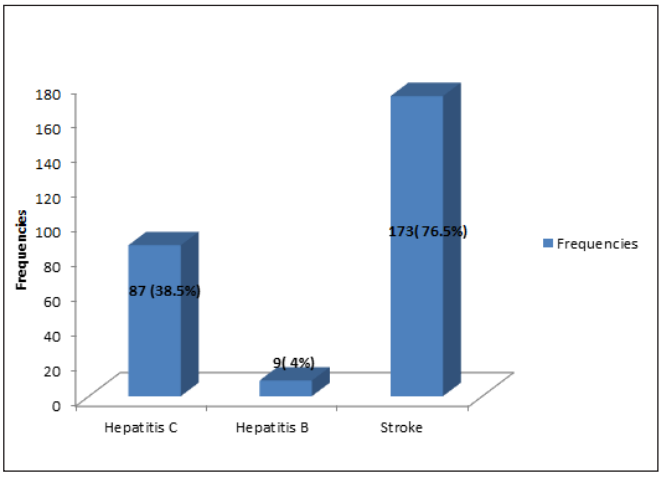


Figure 2: Frequency and Percentages of HCV Patients with and without Stroke. (N=87)

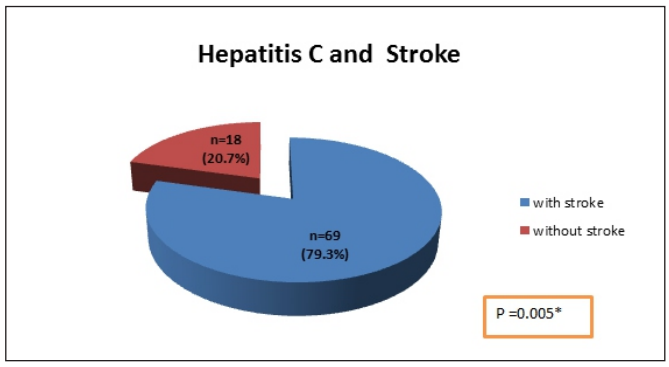
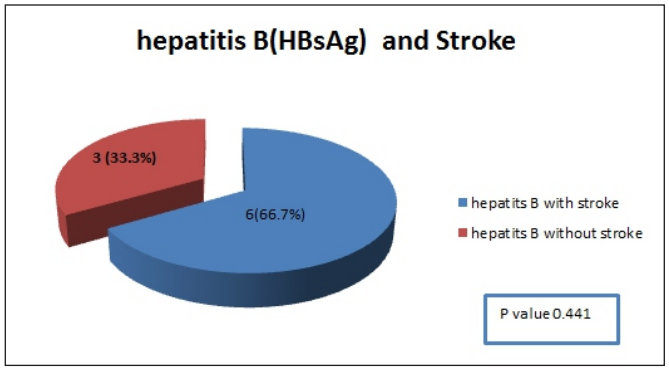


Figure 3: Frequency and Percentages of HBV Patients with and without Stroke. (N= 09)



Discussion

Present retrospective study was conducted to determine the frequency of HCV and HBV in the local population and to high light their association with stroke. Hepatitis is spreading at a break neck pace worldwide. It is continuously increasing in Pakistan involving all the provinces due to increase usage of unsterile syringes, needles, blades, instruments and unchecked blood transfusions while visiting hospitals and barbers[15]. Researches in past also reported high incidence of this issue in Punjab.[16] Very few epidemiological studies are available documenting slightly higher prevalence of HCV in Faisalabad than other regions of Punjab.[17] Data concerning its incidence and risk factors in Faisalabad which is third largest city of Pakistan with population of 5.28 million are still obscure.[18] Lack of awareness and knowledge are highly contributed to its spread and its complications. Proper steps must be taken at government level for the awareness of people to make them enough aware of its complications and to make them know that how they can be safe from contracting this infection by seeking proper precautions. Patients affected with HCV are not only compromising the quality of their lives but also losing courage to live, subsequently putting the burden of the disease on their families and communities.Moreover, affected people are from lower socioeconomic status who even don't bear expenditures of hospital and are also non-compliant to medications. Different studies reported HCV affected patients have complications that affect their quality of life. One of the complications is known to get ischemic stroke.[10,12] However, results regarding this statement are still inconsistent, so taking this into account Liao CC, and his colleagues studied the population at Taiwan and found that HCV patients are at risk for developing stroke.[7] Past researches documented varying etiologies of stroke in HCV subject. Some researchers reported altered cerebral function in the HCV infection which is responsible for cognitive disturbance as well as psycho-neurological issue.[19] Present study focused to determine the frequencies of various viral infections and stroke. It revealed that during three months 38.5% and 4% of the targeted population was seropositive for anti HCV and HBsAg respectively. It is clear from the results that HCV is more prevalent in Faisalabad, Punjab than other viral infections. This documentation of our study is in agreement with Maan MA who in his two year retrospective study at district headquarter (DHQ) hospital, Faisalabad, estimated 21. 99% of prevalence in Faisalabad, Punjab, which is slightly higher than other regions of Pakistan.[17] Highest proportions of HCV serological markers, was found in injection drug users. Preventive strategies on intervention and facilitation of access to healthcare program to safe the local population are required.[17] This study also found the higher seropositivity for anti HCV and HBsAg in females in contrast to males, this finding is in consistent with Ramarokoto CE et al study who reported higher frequency of HCV in females than males (71.42% Vs 28.57%) in his studied population.[5] Result of current study was found that the 79.3% of the HCV patients develop stroke and odd ratio of 1.29 (p value 0.005*) is indicating that these patient poses 1.29 times more risk for stroke than patients with other causes. This finding is suggesting that HCV infection is the independent risk factor for stroke. Current findings are strongly supported by community-based prospective cohort study by Lee MH and his co researches who also labeled the chronic HCV infection as an independent risk predictor of stroke and cerebrovascular deaths with increasing serum HCV RNA level.[20] Our aim of the study was also to analyze the data for association of HBV with stroke and found 66% of the subjects were with stroke but this association was not significant probably due to less number of hepatitis B patients (p value 0.48) in our collected data. More prospective cohort studies will be needed to

confirm this association with underlying biological mechanisms in the future.

Limitation of the study

As this is a retrospective study, so it may also include some subclinical HCV infections associated with stroke, which were left un-diagnosed. Duration of three months is not sufficient, large duration studies on a broader scale are required for monitoring these trends, and further observation regarding spread of this lethal disease.

Conclusion

HCV is more prevalent viral infection in local population and is the independent risk factor for stroke. There is urgent need for policies and preventive strategies at government level. Proper planning is required to eradicate this infection concerning the safety measures, and proper disposal of waste and infective materials in hospitals, as the, most common routes for its spread are the syringes, surgical procedures and blood transfusion.

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Author`s Contribution

Dr. Amsal Amjad: Study design, data collection, Interpretation of results, manuscript writing

Dr. Benash Altaf: Statistical analysis, interpretation of results, formulation of tables, writing the manuscript. Reviewed and approved the manuscript.

Dr. Farah Amir Ali: Acquisition of data, interpretation of results, editing and formatting the manuscript. Reviewed and approved the manuscript.

Dr. Mirza Aroosa Beg: Statistical analysis, interpretation of results, formulation of tables, writing the manuscript. Reviewed and approved the manuscript.