



## Original Article

## Prevalence of Hepatitis B and C Among Stroke Patients in Khairpur

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## ABSTRACT

Hepatitis C virus (HCV) infection is associated with a high likelihood of ischaemic cerebral stroke. Patients with HCV-related stroke tend to be younger, have fewer traditional risk factors, and have elevated levels of systemic inflammation. **Objective:** To investigate the correlation between hepatitis C virus (HCV) infection, hepatitis B virus (HBV) infection and their functional outcome of stroke. **Methods:** This cross-sectional study included 157 individuals diagnosed with all types of strokes. Every patient underwent meticulous history collection and comprehensive clinical and neurological assessment. HCV infection was diagnosed using a quantitative HCV RNA assay. **Results:** Out of the 157 patients, 15 (29.4 %) had Hepatitis B, and thirty-six (70.6 %) had hepatitis C, with an overall prevalence of 51 (32.5%). Among the male patients, HBV and HCV were present in 8 (27.6%) and 21 (72.4%), respectively, with an overall prevalence of 29 (56.9%)(Table 2). Similarly, among female patients, HBV and HCV were present in 7 (31.8%) and 15 (68.8%) patients, respectively, with an overall prevalence of 22 (43.1%). **Conclusions:** An increased prevalence of Hepatitis C Virus (HCV) and Hepatitis B Virus (HBV) has been noted in patients who have experienced a stroke.

## INTRODUCTION

After cardiovascular ischaemia, cerebrovascular stroke is the second most prevalent cause of mortality globally and the third most common cause of disability [1]. Stroke is associated with several risk factors, some of which may be modified, whereas others cannot. Immutable risk variables included sex, age, ethnicity, genetics, and race. Modifiable risk factors include hypertension, dyslipidemia, diabetes mellitus, atrial fibrillation, smoking, drug misuse, and alcoholic consumption, among others [2]. Almost 120 million individuals have long-term infection with hepatitis C virus (HCV). Twenty to thirty percent of Egyptians tested positive for hepatitis C virus infection before the advent of direct-acting antiviral medications [3]. Ischaemic cerebral

stroke is more common in patients infected with hepatitis C virus (HCV). Stroke survivors with HCV are more likely to be younger, lack conventional risk factors, and have high levels of systemic inflammation [4]. In addition, people who have an HCV infection are more likely to die from cerebrovascular causes; this is especially true for people whose blood has higher amounts of HCV RNA [5]. Carotid atherosclerosis was also more common in stroke patients who tested positive for HCV than in those who tested negative, according to a previous study [6]. Approximately 10 million individuals in Pakistan have HCV infection [7]. It's incidence varies throughout Pakistan's communities and geographical areas and is not consistent throughout the

country [8]. In developed nations, needlestick injuries, haemodialysis, blood transfusions, intravenous drug use, tattooing, sexual activity, and contamination during pregnancy are the most commonly acknowledged mechanisms of transmission. The use of contaminated injections and other unsterilised medical equipment plays a significant role in the spread of approximately 8–16 million HBV and 2.5 million HCV infections in third world nations [9, 10]. Although HCV infections seem to be decreasing in developed nations, the chance of contracting this virus is steadily increasing in many third-world nations [11, 12]. Pakistan has grown significantly over the last 20 years. The first comprehensive nationwide study on the prevalence of HCV and HBV was conducted in 2007–2008 [13]. Remarkably, antiviral medicine significantly reduced the risk of stroke, even after considering known prognostic factors. Particularly intriguing is the beneficial effect of treatment, which provides strong evidence that HCV is a causal factor of cerebrovascular diseases [14].

Assessing the frequency of hepatitis B and C infection in stroke survivors was the primary motivation for the present study.

## METHODS

This cross-sectional study was conducted at Khairpur Medical College Hospital from 5 February 2023 to 28 October 2023. Participation in the experiment was contingent on each patient's informed consent. All stroke types were represented by 157 individuals in the study. If a patient manifested any other systemic or neurological disorder that rendered them severely impaired, including cancer or epilepsy, they were subsequently excluded from the experiment. The study protocol was approved by the Shah Abdul Latif University Khairpur Institutional Review Board (Reg# 457, dated: - 26 - 1- 2023). All patients underwent comprehensive neurological and clinical assessment following meticulous history collection. Carotid and vertebralbasilar duplex scans and computed tomography (CT) scans of the brain were included in the radiological assessment. We measured fasting and postprandial blood sugar levels, evaluated HbA1c levels, analysed lipid profiles, and assessed liver and kidney function as part of the laboratory tests that were performed. Quantitative tests for HBV and HCV RNA were performed to confirm the presence of HCV infection. Echocardiography and electrocardiography (ECG) are among the other tests performed. The data collected from the current study were subjected to statistical analysis using Excel 365 and SPSS version 26.0.

## RESULTS

Out of the 157 patients with stroke, ninety-five (60.5%) were male and sixty-two (39.5%) were female. Out of 157, 15 (29.4

%) had Hepatitis B, and thirty-six (70.6 %) had hepatitis C, with an overall prevalence of fifty-one (32.5%). The mean age of the respondents was  $46.5 \pm 7.0$  years and 29 (56.9%) were male and 22 (43.1%) were female. In total, 23 (45.1%) HBV and HCV patients were aged 45 – 60 years 39 (76.5%) were married (Table 1). No formal education was reported by 40 (78.4%), and 11 (21.6%) had some or all middle school education.

**Table 1:** Demographic information of stroke patients with Hepatitis B and C

Demographic Characteristics	HBV +Ve	HCV +Ve	Total
Mean Age	45.1 ± 14.7	48.3 ± 11.4	46.5 ± 7.0
<b>Age</b>			
> 18 - 30	2 (13.3%)	7 (19.4%)	2 (3.9%)
31 - 45	4 (26.7%)	9 (25%)	13 (25.5%)
45 - 60	7 (46.7%)	16 (44.4%)	23 (45.1%)
60 >	2 (13.3%)	4 (11.1%)	6 (11.8%)
<b>Gender</b>			
Male	8 (53.3%)	21 (58.3%)	29 (56.9%)
Female	7 (46.7%)	15 (41.7%)	22 (43.1%)
<b>Marital Status</b>			
Married	12 (80%)	27 (75%)	39 (76.5%)
Unmarried	3 (20%)	9 (25%)	12 (23.5%)
<b>Socio-Economic Status</b>			
Middle Class	7 (46.7%)	15 (41.7%)	22 (43.1%)
Lower Class	8 (53.3%)	21 (58.3%)	29 (56.9%)
<b>Education</b>			
Some Or All Primary, Middle or Post Middle School	4 (26.7%)	7 (19.4%)	11 (21.6%)
No Formal Education	11 (73.3%)	29 (80.6%)	40 (78.4%)

Out of the 157 patients, 15 (29.4 %) had Hepatitis B, and thirty-six (70.6 %) had hepatitis C, with an overall prevalence of 51 (32.5%). Among the male patients, HBV and HCV were present in 8 (27.6%) and 21 (72.4%) patients, respectively, with an overall prevalence of 29 (56.9%) (Table 2). Similarly, among female patients, HBV and HCV were present in 7 (31.8%) and 15 (68.8%) patients, respectively, with an overall prevalence of 22 (43.1%) (Table 2).

**Table 2:** Prevalence of Hepatitis B and C according to gender

Gender	HBV	HCV	Total
Male	8 (27.6%)	21 (72.4%)	29 (56.9%)
Female	7 (31.8%)	15 (68.8%)	22 (43.1%)

## DISCUSSION

In our study, of the 157 patients, 15 (29.4 %) had Hepatitis B, and thirty-six (70.6 %) had hepatitis C, with an overall prevalence of 51 (32.5%). Among the male patients, HBV and HCV were present in 8 (27.6%) and 21 (72.4%) patients, respectively, with an overall prevalence of 29 (56.9%) (Table 2). Similarly, among female patients, HBV and HCV were present in 7 (31.8%) and 15 (68.8%), respectively, with an

overall prevalence of 22 (43.1%). Hepatitis C infection was found to be 5.5% prevalent in Kech district, Balochistan, with a greater frequency among males, according to a previous study [15]. In contrast to females (29.4%), our study revealed a greater frequency in the male population (70.6%). Another study conducted in Balochistan examined hepatitis B in seven districts with a total of 15,260 participants. Research has identified a prevalence rate of 9.8% across various districts, ranging from 3.3% to 17.0% [16]. Additionally, hepatitis C risk variables were investigated in prior research conducted in the Tando Allahyar area. The survey revealed a larger number of females (64% female and 36% male) than males. In contrast, we found that the Tando Allahyar area has a distinct distribution of hepatitis C prevalence. Our best estimate is that 24.87% of instances are overall, with 27.31% being men and 22.57% being females [17]. Hepatitis B and C are chronic illnesses that are recognised worldwide and may remain inactive for extended periods, even spanning many decades. Approximately 60% of liver malignancies may be attributable to delayed detection and treatment of viral infections. To achieve the worldwide aim of eliminating chronic hepatitis, it is crucial to increase awareness about the monitoring and treatment of these persistently spreading chronic illnesses. The occurrence of viral hepatitis is widespread worldwide, with the prevalence fluctuating on a daily basis. According to the Global Burden of Diseases, Injuries, and Risk Factors 2010, the World Health Organization (WHO) reported a prevalence rate of 1.0% for hepatitis C. They also noted a prior rise from 2.3% to 2.8% between 1990 and 2005 [18, 19]. Multiple studies have shown a rising incidence of hepatitis B among certain high-risk populations such as medical waste handlers, blood donors, and those of reproductive age [20-22].

## CONCLUSIONS

An increased prevalence of Hepatitis C Virus (HCV) and Hepatitis B Virus (HBV) has been noted in patients who have suffered a stroke.

## Authors Contribution

Conceptualization: RAA

Methodology: JA, SL

Formal analysis: YAJ, WMM

Writing-review and editing: YAJ, MH

All authors have read and agreed to the published version of the manuscript.

## Conflicts of Interest

The authors declare no conflict of interest.

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