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ORIGINAL ARTICLE

Frequency of chronic Hepatitis B and Hepatitis C seropositivity in haemodialysis patients; A single center study.

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ABSTRACT… Objectives: To study the spectrum of chronic hepatitis in haemodialysis patients. **Study Design:** Cross Sectional study. **Setting:** Kutiyanana Memon Hospital (KMH), A Tertiary Care, Charity Hospital at Karachi, Pakistan. **Period:** Jun 2015 to May 2020. **Material & Methods:** During the study period, 87 patients were followed up on and tested for hepatitis B and C virus infection. The patients were included in the study after calculation of sample size and application of inclusion and exclusion criteria. AxSYM, an enzyme-linked immunosorbent assay (ELISA)-based fast immunochromatographic technology, was used to screen the samples (Abbott Laboratories, Abbot Park, IL, USA). Hepatitis B and C prevalence was established, as well as the frequency of different sequelae such cirrhosis, encephalopathy, and hepatocellular cancer. **Results:** Our sample population was almost evenly split between males and females, with 44 (51%) males and 43 (59%) females. Three of the 43 females tested positive for HBV, whereas 19 (63 %) tested positive for HCV. On the other hand, in males, 11 (37 %) had chronic HCV and 9 (75 %) had Chronic HBV infection, accounting for 34% of the total HBV population. **Conclusion:** In haemodialysis patients, hepatitis B and C are very common. They are adding to morbidity and mortality of already suffering community. This trend is surrogate marker of suboptimal infection control techniques during dialysis in underdeveloped countries like Pakistan. To protect an already afflicted community from a potentially preventable disease, immediate measures are required for prevention and early diagnosis of chronic hepatitis.

Key words: Dialysis, Hepatitis C, Hepatitis B.

INTRODUCTION

Hepatitis C Virus (HCV) is an RNA virus that belongs to the genus Hepacivirus.[1] It is quite common among dialysis patients. In some studies, prevalence rates of up to 28% have been observed in various nations, particularly in developing countries including Pakistan.[2,3] Infection with the hepatitis C virus is a worldwide concern, with just under 4,000,000 cases reported each year. Dialysis is thought to predispose to the transmission of both hepatitis B and C.[4] Infections with hepatitis B and C have been described all over the world.[3] When ALT levels are elevated and hepatitis B surface antigen and/or anti-HCV antibodies are detected, a diagnosis is usually suspected. These tests can detect most clinical infections, though there are a few caveats. Chronic hepatitis is diagnosed when seropositivity and high liver enzymes last longer than six months.[5,6]

In terms of mortality and morbidity, hepatitis B is not far behind hepatitis C in the dialysis community. More than two billion people are estimated to be infected with hepatitis B at some point in their lives, and fifty-three million patients are currently living as active chronic hepatitis B virus cases. According to statistics from WHO, hepatitis B is the tenth leading cause of death in the world population.[6,7]

Haemodialysis patients are particularly susceptible to hepatitis B infection. This vulnerability is not only because they frequently undergo invasive procedures and receive

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repeated blood transfusions, but also because they are immunocompromised. The response to hepatitis B vaccination is suboptimal in these patients.[7] In addition, due to high prevalence and poor education standards in underdeveloped communities, suboptimal cleaning techniques in dialysis units are a common problem that is increasing at an alarming rate.[8] This is a major public health issue on a worldwide scale. In practise, however, the actual frequency of hepatitis B varies widely from one nation to the next and even across different dialysis clinics within the same country. The incidence ranges from one percent to as high as forty percent, and it has been described in a number of works of international literature.[9]

Treatment of hepatitis B is not only costly but also involves a few side effects .These side effects occur in more than 90% of patients, resulting in a lower response to treatment than in the non-dialysis population. Therefore, prevention is the preferred modality to deal with hepatitis B.

There are many common factors between hepatitis B and C. The modes of transmission of hepatitis B and hepatitis C are almost identical, so coinfection with hepatitis Band C is not uncommon. Both hepatitis B and hepatitis C are associated with numerous complications, such as cirrhosis, ascites, portal hypertension and GI bleeding, hemorrhoids, hepatic encephalopathy, and even liver cancer Dialysis patients are particularly exposed to these adverse effects.[10]

The difficulty in diagnosing and slow progress of the cirrhotic process makes epidemiological studies difficult. Infection with the hepatitis C virus (HCV) is the most prevalent cause of chronic liver disease throughout the world. According to recent literature, certain groups, such as patients undergoing maintenance hemodialysis (MHD), have a much greater prevalence of HCV infection, with rates ranging from 5 to 25 percent or even higher in certain instances. This cohort may be an outstanding model for studying the influence of HCV infection on outcomes, particularly given the short-term mortality risk among MHD patients in the United States is exceedingly high, with at least 20% of patients dying each year in the near term.[11] Several studies have demonstrated that HCV infection is related with increased mortality in this population, but the number and selectivity of these studies have been restricted, with the biggest study included only 367 HCV-infected individuals. Given the fact that liver disease that is associated with HCV usually takes decades for its clinical manifestation, this time period is usually longer than the lifespan of majority of dialysis patients where 60 to 70 % have a 5-year survival rate. Hence liver diseases appear to be an unlikely cause of the high death risk associated with dialysis.[12]

Much research has been published at the global and local levels. Yet, we lag far behind industrialized nations in adequately addressing this issue. The main aim of our study was to find out the prevalence of hepatitis B and C in our dialysis community and try to find out various correlations like cirrhosis, encephalopathy and hepatoma etc. This information can help develop preventive strategies to better control transmission of these potentially reversible but life-threatening diseases. Our study will also help estimate the burden of disease in a poor country like Pakistan. Global data indicate that the prevalence of HBV and HCV infections is high among residents of African community and the Middle Eastern countries. According to WHO, HCV infection affects 4.6% of the population in the Eastern Mediterranean and 5.3% of the population in Africa.[7-10] Our statistics are likely to be similar or even higher than those countries .This study will help to bring awareness of this largely overlooked health problem.

MATERIAL & METHODS

This study was organized to determine the frequency of hepatitis B and C seropositivity in patients undergoing dialysisit was a cross sectional study carried out between Jun 2015 - May 2020 at Kutiyana Memon Hospital (KMH) after taking approval of Ethical review committee vide letter no KMH/ADNIN/267-05/2016. Our study was conducted in the dialysis centre of the same hospital. Dialysis facility has 16 machines that are carefully maintained. Infection control measures are strictly followed. Separate

machines are reserved for hepatitis B and C. A sample size of 87 cases was calculated (using open epi website calculator) with 95% confidence level, 5% margin of error while taking expected frequency of Hepatitis B seropositivity to be 9.2% in hemodialysis patients.[11]

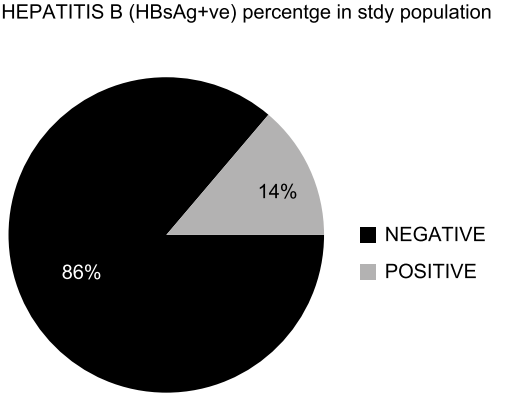
A total of 87 patients undergoing haemodialysis at this centre during that time were included. All age groups and genders were included in this study. All patients were included in the study after applying inclusion and exclusion criteria. We used a nonprobability convenience sampling strategy. Those patients who were on dialysis for shorter period (less than three months) in our centre were excluded. Moreover, those patients who visited more then one dialysis centres during study period were also excluded. Similarly, those who died earlier than six months after seropositivity were also excluded. The blood samples were collected under strictly aseptic conditions. They were sent to the laboratory of our dialysis center. The blood sample was processed by ELISA technique for detection of HBsAg and HCV antibodies and the results were recorded in a prescribed form. All the details of the patients including demographic parameters, metabolic profile, hepatitis profile, blood transfusion history, ultrasound findings and duration of dialysis treatment were noted. The occurrence of various complications like cirrhosis, gastrointestinal bleeding and encephalopathy was noted separately. The data was analyzed using SPSS v28. Frequencies and percentages were calculated.

RESULTS

Our study included 87 patients with kidney disorders who were receiving dialysis as part of their therapy, irrespective of age or gender. Our research population had an average age of 44 years. The demographic was diverse, with the youngest patient being 19 years of age and the oldest being 77 years old. The mean age of the various groups was not considerably different. The mean age of patients with Hepatitis B and C, as well as those without hepatitis was approximately 45 years across all three categories. This was in marked contrast to HCV patients, who had a mean age of 46 years.

Our sample population was virtually evenly split between males and females, with 44 (51%) males and 43 (59%) females. Three of the 43 females (6.9%) tested positive for HBV, whereas 19 (63 %) tested positive for HCV. On the other hand, among males, 11 (37 %) had CHC and 9 (75 %) had Chronic HBV infection, accounting for 34% of the total HBV population. Overall, HBV was more prevalent in males, whereas HCV was more prevalent in females, accounting for 19 (64%) of the HCV population. Chronic HCV infection was more widespread in our study sample, accounting for 35% of patients, while only 14% of patients had chronic HBV infection.

Chronic HCV infection was more widespread in our study sample, accounting for 35% of patients, while only 14% of patients had chronic HBV infection. The average duration on dialysis treatment was four years. However, an increase in dialysis period was associated with an increase in HBV prevalence. The mean duration of dialysis for HBV patients was 5 years, which was greater than the corresponding mean duration of dialysis for HCV patients (3.9 years).



Gender	Total Cases n (%)	Cases Positive for Anti-HCV Antibodies n (%)
Female	43 (49%)	19 (63%)
Male	44(51%)	11 (37%)
Total	100 (100%)	30 (34%)

Table-I. Anti-HCV antibodies Positive cases among dialysis patients

HCV: Hepatitis C Virus

Of the 87 total patients attending the Kutyana

dialysis facility during the study period who were screened, 30 (34%) were positive for anti-HCV antibodies. Females were predominantly affected 19 (63%).

DISCUSSION

Once a patient reaches end-stage renal illness, the sole option is transplantation, which is often not possible, or haemodialysis.[11-13] He would require dialysis twice or three times weekly to maintain a reasonable quality of life. However, due to the potentially invasive nature of dialysis and repeated transfusions, many of these patients are at an increased risk of developing numerous blood bone infections such as chronic hepatitis B, C, and even hepatitis D.[14,15]

Ambreen et al. conducted a comparable study using similar objectives but a different model. They collected data in a random order and used a cross-sectional approach. They documented a male-dominated population with a male-to-female ratio of (2.5:1), with 43 males and 17 females. Males also had a higher seropositivity ratio (3.6:3) for HCV and (2:2.5) for HBsAg. Eleven of the HCV-positive individuals were male, whereas three were female. Similarly, five of the six patients who tested positive for HBsAg were male, whereas only two were female. In comparison to them, our male and female population proportions were about same, with each contributing roughly 50%. However, corresponding to their findings, the male gender was particularly hard hit by chronic hepatitis C. However, in our analysis, males were more likely to contract hepatitis B than females, a striking contrast between the two studies. This might be a result of the dissimilar populations from different places and the dissimilar male-female ratios in the two groups. This evidenced by the fact that 63% of female patients had hepatitis C, compared to 37% of men.[14]

Numerous studies have shown contradictory findings on the association between multiple parameters such as frequency, duration, and mode of dialysis and hepatitis B and C positive ratios. Despite these assertions, no universal agreement on the precise quantity of each factor has been reached. Although it is widely assumed that the introduction of hepatitis B vaccine altered the scenario drastically, we still have two billion people who have been affected by hepatitis C and over 350,000,000 people who have chronic hepatitis B.[10,15] While most patients who begin dialysis are vaccinated, the very high positive rate indicates that there are numerous gaps in the effective protection of this infection. Skender et al. in Kosovo found a correlation between prolonged dialysis and an increased vulnerability to chronic hepatitis, which was also true in our investigation. They did not specify any specific period for dialysis, but our study found that patients with chronic hepatitis underwent dialysis for an average of four years. This was duration was significantly longer for HBV (5 years). Tinrune et al. and other authors also identified dialysis time as a risk factor for chronic hepatitis B and C infection.[15,16] This appears to be result of increased exposure to numerous transfusion and invasive treatments, as well as a longer duration of dialysis.

A few researchers have done very in depth analysis of factors associated with chronic hepatitis during dialysis.One landmark study was published in 2007 in which Kamyaar et al states," According to our findings, HCV infection is more frequent among younger Maintenance Hemodialysis patients, particularly those from minority racial and cultural origins, than among older patients.

However, we did not perform such extensive study because of being charity hospital with multiple financial constraints.

LIMITATIONS

Our study was limited by selection bias, as Kutayana hospital was one of the few hospitals in the country that provided dialysis to patients with hepatitis. While the situation has improved significantly, the factor may have overestimated hepatitis prevalence.

CONCLUSION

The high prevalence of chronic hepatitis in dialysis patients is surrogate marker of suboptimal infection control techniques during dialysis in

underdeveloped countries like Pakistan. To protect an already afflicted community from a potentially preventable disease, immediate measures are required for prevention and early diagnosis of chronic hepatitis.

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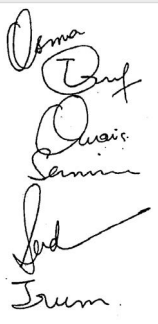
1	Asma Naveed	Main researcher.	
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3	Muhammad Owais Ismail	Supervision of research.	
4	Samina Naseem Khattak	Literature review.	
5	Sadia Rehman	Planning of research, literature review and analysis.	
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