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HAEMODIALYSIS;

AWARENESS AND CARE NEEDED TO PREVENT HEPATITIS C INFECTION IN HAEMODIALYSIS PATIENTS.

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ABSTRACT… Background: Hepatitis C is an important health issue in chronic kidney disease patients especially those on regular hemodialysis. The cause of this high prevalence remains multi-factorial. Despite of various infection control measures adopted worldwide, hepatitis c high seroconversion rates among dialysis patients remain a major health concern. **Objectives:** The objective of this study was to determine the frequency of seroconversion of hepatitis C in patients on maintenance hemodialysis in our set-up and also to find the various risk factors attributing to it. **Study Design:** Retrospective study. **Place and duration of study:** Hemodialysis unit of LAHORE GENERAL HOSPITAL since August, 2016. **Methods:** Forty seven patients on routine hemodialysis who were initially sero negative for hepatitis C at the time of registration in Lahore general hospital dialysis centre and frequency of seroconversion to positive for anti HCV was calculated using SPSS 20. The various variables were analyzed on basis of p-value (significant <0.05). **Results:** Out of total 47 patients, 6 patients (12.80%) were found to be sero converted to hepatitis C during the dialysis treatment in our centre. History of surgical procedure (major/minor) (83.3%, p value:0.006) and presence of hepatitis C in spouse (66.7%, p value :0.0001) were found to be statistically significant risk factors. **Conclusion:** The current study indicates the high rates of hepatitis C seroconversion in hemodialysis patients and the various contributing risk factors for it. Because of the immunodeficiency in these patients, intense education to medical staff as well as patients themselves will be beneficial in controlling the spread.

Key words: Hepatitis C, chronic hemodialysis

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INTRODUCTION

Hepatitis C is becoming a global health problem.[1] HCV is responsible for large number of deaths from cirrhosis and liver cancer every year.[2] About 2.2% of world's population is suffering from hepatitis C.[3] The disease is becoming a major health problem of developing countries like Pakistan.[4] Pakistan has the second highest prevalence rate of hepatitis C ranging from 4.5 to 8 % with new cases reported every year in increasing numbers.[5]

The prevalence of HCV in chronic hemodialysis patients is much higher than in general population.[6] The higher risk of HCV in patients undergoing hemodialysis is due to underlying impaired cellular immunity which increases their susceptibility to infections.[7] In addition, the process of hemodialysis requires blood exposure to infectious material through the extracorporeal circulation for prolonged periods. Also hemodialysis patients require frequent blood transfusions, frequent hospitalization and surgeries which increase the HCV transmission risk.[8]

HCV infection is related to higher morbidity and mortality in hemodialysis patients even after they have received renal transplant.[9] Despite of various quality control measures adopted to reduce the risk of HCV transmission in End stage renal disease population, HCV prevalence in end stage renal disease patients remains a concern. In this study, we tried to investigate HCV seroconversion

rates among the patients on regular maintenance hemodialysis registered in the dialysis department of Lahore general hospital since August, 2016 and the various factors responsible for this seroconversion.

MATERIALS & METHODS

A retrospective analysis was performed on forty seven patients routinely visiting the hemodialysis unit of LAHORE GENERAL HOSPITAL since August, 2016.

All patients of end stage renal disease on maintenance hemodialysis visiting dialysis centre of Lahore general hospital who tested negative for hepatitis C since beginning along with those who were Hepatitis C negative initially but later sero-converted to hepatitis C positive, were included in the study while patients who were hepatitis C positive since beginning of regular hemodialysis were excluded from the survey. Socioeconomic data were collected by the trained nursing staff of dialysis unit.

CLASSIFICATION OF HCV STATUS

All patients had both a baseline and a follow-up HCV serology. Both baseline and follow up data were gathered from their medical records. The diagnosis of hepatitis C was verified on the basis of the presence of ANTI-HCV antibodies in the sera detected by ELISA(enzyme linked immunosorbent assay). Seroconversion was defined as change of anti HCV negative in initial reports to anti HCV positive in latest report.

STATISTICAL ANALYSIS

Statistical analysis was performed by SPSS v22.0. Qualitative data were expressed by frequency (percentage) and quantitative data by mean ± standard deviation or median ± quartiles. The variables included were: demographics (age and sex), the Re-use of dialysate, Infection control measures adopted during dialysis, Separate protocol for Hepatitis C patients adopted in dialysis centre, Isolate Hepatitis C positive patients in the centre, Isolate Hepatitis B positive patients in the centre, Screening for Hepatitis C at least yearly.

RESULTS

In this study, we analyzed 47 patients with the mean age of 41.95±15.51 years and were undergoing regular hemodialysis. Among them, 32 (~68.1%) and 15 (31.9%) were males and females, respectively. Furthermore, the average duration of the dialysis was 2.02±0.84 years.

By the end of the study, 6 (~12.80%) patients were reported to be reactive to anti-HCV Elisa test. Among these 6 patients, 5 (~83.3%) patients were sero-converted and underwent either major or minor surgical procedure while on maintenance dialysis. Therefore, the p-value came out to be 0.006.

Whereas, significant associations with Hepatitis-C (4 out of 6 patients, ~ 66.7%) were reported in spouses, giving the p-value less than 0.0001 (Figure-1). In addition to it, significant associations were also observed between the change in dialysis center and sero-conversion of Hepatitis-C. According to our study, since the start of hemodialysis, 88.3% of sero-converted patients had at least once changed their dialysis centers as compared to 48.8% of the non-converted patients (p-value:0.44).

Furthermore, 66.7% of those patients who used to regularly visit the barber were reported to be sero-converted to Hepatitis-C (p-value: 0.78) lastly, all the sero-converted patients reported change of nursing staff for each dialysis session.

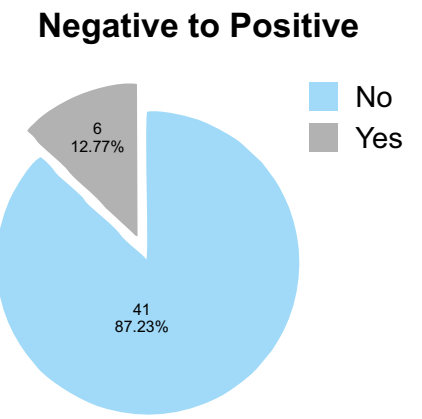

Figure-1

No association was observed between sero-conversion and other factors such as the reuse of Dialysate, adaption of infection control measures, routine administration of Hepatitis-B vaccine to patients undergoing hemodialysis, and provision of emergency dialysis services to the patients in the same center. (Table-I)

Variables		Frequency	Percentage (%)
Re-use of dialysate	Yes	3	6.40
	No	44	93.60
Infection control measures adopted during dialysis	Yes	41	87.20
	No	6	12.80
Separate protocol for Hepatitis C patients adopted in dialysis centre	Yes	45	95.70
	No	2	4.30
Isolate Hepatitis C positive patients in the centre	Yes	47	100.0
	No	0	0
Isolate Hepatitis B positive patients in the centre	Yes	47	100.0
	No	0	0
Screening for Hepatitis C at least yearly	Yes	42	89.4
	No	5	10.6

DISCUSSION

Sero-conversion of Hepatitis C in patients on chronic hemodialysis is an extremely common phenomenon in countries like Pakistan where hepatitis C is becoming a major epidemic. The seroconversion rate for Hepatitis C is multiple times higher in patients undergoing Hemodialysis than in normal healthy people.[10] Patients with end stage renal disease undergoing hemodialysis require a series of precautionary measures in order to prevent hepatitis C.

The retrospective study was conducted in Hemodialysis unit of Lahore General Hospital, Lahore on a sample size of 46 patients over a period of 8 to 12 weeks. Usually, after an acute insult HCV RNA gets detectable in blood within 1 to 3 weeks.[11] As the study indicates, a ratio of 12% seroconversion is alarming and needs to be urgently controlled. Furthermore, it is very important to ascertain and address the risk factors that hold responsibility for this critically high seroconversion rate.

The most significant i.e. 83% of seroconverted patients while on maintenance hemodialysis underwent a major or minor surgical procedure. Studies have shown significant associations between seroconversion and history of renal transplantation or surgical intervention.[12] Considering the mentioned risk factor as modifiable, steps and major preventive measures while operating (pre-op and post-op both) should be taken to reduce the elevated risk.

This includes infection control and prompt diagnosis. Studies show that early diagnosis not only enables appropriate treatment to those who require but also plays a major role in infection control.[13] Pre-Op and Post-Op measures thereby also include Isolation of HCV positive patients in High dependency units to protect them from transmission before and after surgery.[14] It also includes multiple Blood transfusions which is already a common practice in patients on Chronic end stage renal disease.

These blood transfusions pose a major risk for Hepatitis seroconversion and transmission.[15] Another statistically significant association i.e. 66% conversion rate was found in the spouses of seroconverted patients, hence requiring patient education regarding sexually transmitted infections and calls for hepatitis C annual screening programs of couples.

Studies already indicate moderately significant association of sexual transmission of Hepatitis C in patients on maintenance hemodialysis.[16] As it is practically modifiable, any step taken in this regard can significantly lower the hepatitis C seroconversion risk in cases of end stage renal disease on maintenance hemodialysis. Another modifiable risk factor i.e. change of dialysis center was found to be positive in 83% of seroconverted patients.

Majority of our patients had referral record and were previously treated at various centers within different cities of Punjab, Pakistan. It clearly

indicates dire need of patient education regarding their follow up with only one dialysis center during and throughout the course of treatment. Increased risk for HCV with multiple hemodialysis centers suggests differences in infection control precautions occur between units.[17] Studies also suggest associations between staffing practice patterns at the various different hemodialysis centers and Hepatitis C seroconversion rates.

Our research therefore sets up our intent to support building of hemodialysis centers across the country where we have increased number of highly trained staff that can significantly lower hepatitis seroconversion rates in patients on chronic hemodialysis. Furthermore, increased risk for seroconversion is directly linked with treatment given at multiple dialysis centers and inexperienced patient care staff.[18] Certain duty staff needs should also be reviewed to ensure they are not a barrier to implementing best practices.[19]

Visits to barbers was another significant modifiable risk factors found in the patients who were reported to have seroconverted. Used razors and unhygienic conditions already are major risk factors in Hepatitis C seroconversion. The practice is common in Pakistan since decades and needs to be ceased. Reuse of dialysate brought no significant finding in our study. Provision of Emergency dialysis services to the patients in the same center was also considered but had shown no alteration in the findings. Similarly, provision of hepatitis B vaccination to the patients on hemodialysis showed no association with the rate of seroconversion.

LIMITATIONS

Our study had many limitations amongst which shrunken sample size was the most significant. Study was conducted over a period of 8 to 12 weeks and was based on data collected from a single dialysis center of Lahore.

Principally, Study suggests that there is alarmingly high prevalence rate of hepatitis C seroconversion in patients on chronic hemodialysis. Strict infection control measures taken during surgical procedures and patient self-education if emphasized, would greatly reduce the seroconversion rate in patients on hemodialysis.

CONCLUSION

Frequency of seroconversion among patients on maintenance hemodialysis is unexpectedly high and is multifactorial. Factors like poor infection control protocols during surgical procedures as well as hemodialysis directly contribute to it.

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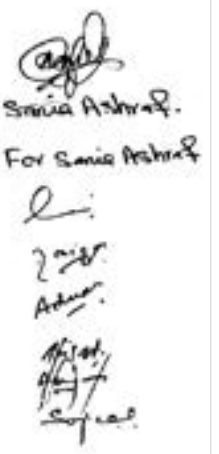
1	Aurangzeb Afzal	1st Author	
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