Antibody level after hepatitis b vaccination in hemodialysis

ABSTRACT

OBJECTIVE

The objective of this study was to determine the antibody level after Hepatitis B vaccination in chronic hemodialysis patients.

METHOD:

All patients undergoing chronic hemodialysis (HD) at the dialysis unit of Liaquat National Hospital, fulfilling the inclusion and exclusion criteria were enrolled between April 2013 and September 2013, after taking informed consent. AntiHbs (Hepatitis B surface antibody) titers were measured. Patients were differentiated as Immune and nonimmune based on antibody titers, with levels of > 10 IU/l being considered as immune and levels of <10 IU/l as non immune . AntiHbs titer was measured by ELISA (Enzyme Linked Immunosorbant Assay). Data was analyzed using SPSS version 14. 0 for windows. Chi square test were used to ascertain the statistical significance. P value <0. 05 was taken as statistically significant. In addition, the effect of age, gender and duration of Hemodialysis on antibody titer was also observed.

RESULTS:

Out of 118 patients enrolled, 103 (87. 3%) had an adequate antibody response and were considered immune while only 15 patients (12. 7%) had an inadequate antibody response rendering them non immune.

AntiHbs titers showed no significant co-relation with gender and duration of Hemodialysis therapy (p> 0. 05), while age was found to have significant correlation as younger age group (<60years) had more immune response (p <0. 001).

CONCLUSION:

Our study showed a very good Antibody response to Hepatitis B vaccination among hemodialysis patients that correlated with age with younger age group having a better response but no correlation to gender and duration of dialysis.

KEYWORDS:

Hepatitis B virus, Anti-HBs antibody, Hemodialysis, Prevalence, Vaccination.

INTRODUCTION

Hepatitis B virus (HBV) infection is a common but avoidable disease. Hepatitis B virus (HBV) is a DNA virus that can be communicated via saliva, body fluids, semen, vaginal fluids, blood products, sexual contacts or prenatally influencing 350-400 million persons round the globe (1-3). In contrast to general population, hemodialysis patients are at higher risk of acquiring Hepatitis B Virus because of direct exposure to blood products, shared hemodialysis devices, needle pricks and hemodialysis process which involve access to blood circulation.(4) Hence, Hemodialysis patients are vulnerable to infections with Hepatitis B Virus and hepatitis C virus (HCV). The prevalence of Hepatitis B Virus in hemodialysis (HD) patients varies significantly between countries, ranging from minimal in developed countries

to very high in some developing countries. Despite the fact that many steps have been taken for the prevention of HBV infection like mass vaccination programs, implementation of thorough blood donor screening, awareness & encouragement programs of erythropoietin use and generalize availability in hemodialysis centers, Hepatitis B Virus infection remains a major concern in Hemodialysis centers majorly in developing countries (5). Patients who are on maintenance hemodialysis are considered as high-risk group, resulting in high incidence and mortality. Therefore, to vaccinate them against the virus is mandatory. Compared to a response rate of over 90% in the normal population, only 50 to 60% of those with end-stage renal disease achieve adequate antibody levels following immunization (6, 7). Various tactics have been employed to overcome the low seroconversion rate like co-administering zinc, gamma-interferon, thymopentin, interleukin-2, and levamisole as immunostimulants or adjuvants as well as changing the injection mode (intradermal versus intramuscular) or doubling the vaccine dose (7, 8).

Low immune response to hepatitis B vaccination in patients on HD is noticed in several studies but has never been studied in our population. Therefore our aim is to conduct a study in our population to determine the serum Anti-Hbs levels in these patients following vaccination.

MATERIAL & METHODS

From April 2013 to September 2013, 118 patients undergoing HD in Liaquat National Hospital and Medical College were screened for anti-HBs. A questionnaire was used to collect the demographic data and duration of HD.

All patients were included in HD unit who underwent primary vaccination within last one year (four doses: recombinant HB vaccine; 40 ug, i. m, at 0, 1, 2 and 6 months). Exclusion criteria included patients on immunosuppressive drugs, malignancy or HIV positive patients. Enzyme linked immunosorbent assay (ELISA, Biokit, Spain) was used to measure Anti-HBs antibodies titers. The data was analyzed by SPSS ® for windows® (version 14. 0 Chicago, IL, USA). A p value <0. 05 was considered statistically significant.

RESULTS

We enrolled total of 118 patients on Hemodialysis who were recently vaccinated. Demographics are shown in Figure 1. Patient's age ranged from 20-71 years. 46. 6 %(N= 55) wereMalewith mean age 53. 2 ±10. 02 yrs and 53. 1 %(N= 63) wereFemaleswith mean Age of 51. 59 ±10. 63 yrs. Age was found to have significant impact on Hepatitis B surface antibody titer with patients <60 years of age being more immune(p <0. 05). Correlation between gender and anti-HBs antibody titer was not statistically significant (p> 0. 05). Out of 118 patients, 15 (12. 7%) were found to have Inadequate response or Non-immune, where as, 104 (87. 3%) had an Adequate response and responded well to the immunization. Duration on Hemodialysis ranges from 1-4 yr with mean duration of 1. 97±0. 77 years, most of the patients had less than 3 years of Hemodialysis 97. 5% (N= 115/118) and only 3 patients (2. 5%) were in year 4. Duration of Hemodialysis failed to show any significant impact on Hepatitis B vaccination response rate (p> 0. 05).

DISCUSSION:

An increased risk of exposure to HBV infection is observed in patients on maintenance hemodialysis (9) It has been observed that after vaccination for Hepatitis B, hemodialysis patients develop lower antibody titers compared to healthy individuals, and even if they are immunized, their antibody titers falls shortly within a year(10).

The present study showed a very high response to hepatitis-B vaccination among hemodialysis patients. One hundred and four (87. 6%) patients showed good antibody response after vaccination. Previous studies in hemodialysis patients have shown a variable hepatitis-B vaccination response rate, ranging from 47%-73%.(11-13). Comparable good results to hepatitis-B vaccination in hemodialysis patients had also been observed in areas with intermediate endemicity (2-8%) prevalence of Hepatitis B Virus , such as in Brazil , which approached 89. 5% in one study.(14)

A recent meta-analysis of 17 clinical trials showed decreased response to hepatitis-B vaccination among older dialysis patients(15) which might be attributed to age associated changes to immune status, where “ older” was defined at age 50 yrs. Our patients mean age were 52. 3±10. 04 yrs correlating with Meta analysis age group, and our results are similar with older patients having less immune response.(11, 16, 17)

In the present study, gender and duration of hemodialysis therapy did not have any correlation to hepatitis-B vaccination. These results are in agreement with those reported by Peces et al .(18). Dacko et al.(16) and Tele et al(14). Similarly, Roozbeh et al(19) also confirmed the same results and

showed that gender did not differ between responders (immune) and non-responders (non-immune) to hepatitis-B vaccination.

CONCLUSION:

We report a very good response to hepatitis-B vaccination among hemodialysis patients that is neither co-relating with gender or duration of hemodialysis. This was a preliminary study in our population which only estimated the response rate against vaccination. Future studies are needed to determine the impact of nutrional status and adequacy of hemodialysis on the response rate of vaccination as previous studies has shown their influences over titer levels.