

## Source and Response of Antibody to Hepatitis B Vaccine in Hemodialysis Patients

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**Background and Aims:** All chronic hemodialysis patients for hepatitis B infection have to be tested and vaccinated against HBV infection routinely.

**Methods:** A descriptive study was designed in 47 hemodialysis patients. After a blood sample was taken for serologic status, three doses (0, 1, 6 month) of hepatitis B vaccine were administered. Repeated titers were obtained one month after the last vaccination and analyzed by ELISA.

**Results:** 39 patients (83%) became immune with protective levels of HBs antibody. There was not a significant correlation between sex, age, smoking, underlying diseases, weight, duration of dialysis and positive HBs antibody after vaccination.

**Conclusions:** Hemodialysis patients need follow-up testing.

**Keywords:** Hemodialysis, Hepatitis B Vaccination

### Introduction

HBV infection in chronic hemodialysis center was seen in patients who had not been vaccinated against hepatitis B <sup>(1)</sup>. Use of the recommended hepatitis B immunization results in seroconversion rates of 90%-99% in immunocompetent individuals <sup>(2, 3)</sup>, but the antibody response is lower in hemodialysis patients [50%-60% <sup>(1)</sup>, 60%-70% <sup>(4)</sup>]. Levels of anti-HBs above 10 mIU/ml provide virtually complete protection against HBV <sup>(5)</sup>.

### Materials and Methods

A descriptive study was designed in 47 hemodialysis patients (between 2004 and 2006) who had been on dialysis for at least 3 months, three times a week. They did not have a history of hepatitis B vaccination or hepatitis B infection. There was a negative HBV serologic status (HBsAg, total anti-HBc, IgM anti-HBc, anti-HBs). Five ml blood sample was analyzed by ELISA, (Dia-pro kit, Italy). Forty micrograms HB vaccine (Herberbiovac HB, Herber Biotec, Havana, Cuba) was administered intramuscularly into the deltoid muscle at 0, 1, 6 months. Repeated serologic status was determined 1 month after vaccination.

Statistical analysis was performed by SPSS software (significance P values < 0.05).

### Results

Forty-seven patients (28 female, 19 male) were evaluated. After vaccination, 39 (83%) patients (95% CI: 69.5%-96.5%) became immune with protective HBs antibody (>10 mIU/ml). Before vaccination, the mean of age was 52.4±15.5 years and after vaccination, it was 52.9±12.1 years. There was not a significant difference between age and protective HBs antibody level using Mann-Whitney test. The mean duration of dialysis was 3±1.6 months in patients (n=39) with protective HBsAb

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and it was 2.7+1.5 months in the patients (n=8) with unprotective HBsAb after vaccination. The mean weight was 62.6+11.3 kg in the patients with protective HBsAb and 63.1+10.5 kg in the unprotective patients. (Not significance with Mann-Whitney test).

Six patients with protective HBsAb were smoker and 2 patients failed to have a protective immune response after vaccination. There were two patients with a history of hepatitis C and chronic ambulatory peritoneal dialysis. (Not significance with Fisher test).

There was not a significant correlation between underlying disease and protective HBsAb (Chi-square test).

There was positive HBcAb titer in one patient after vaccination. But there was HBcAb (IgM) < 5 IU/ml in all patients.

## Discussion

Results showed that 83% of the hemodialysis patients had protective HBsAb (>10 mIU/ml) after vaccination. This is in disagreement with the results of Elwell (3), Lewis- Ximene (6), Duchini (7) as the rate of responsiveness has been 58%, 53%, 50% and 60%, respectively in those studies.

In our study, there was not difference between age and protective HBsAb level. This is in agreement with Ramzani (8), but it is less than Peces' finding (9). Peces and colleagues reported the rate of protective HBsAb 100%, 75%, 74% among < 40 years, 40-60 years and old adults >60 years in hemodialysis patients after four doses of hepatitis B vaccine (40 µg), respectively. This could be in part explained by higher age patients in our study.

The results suggest there was not a significant difference between HBsAb titers with duration of dialysis, so it seems that longer duration of dialysis is not more immunosuppressive.

In this research, there was not a significant correlation between sex and protective HBsAb level.

This is in agreement with Peces' (9) and Ramzani's (8) researches.

After complete vaccination, there was positive HBsAb in only one patient, but HBcAb-IgM was less than 5 IU/ml. This suggests that source of HBsAb was due to hepatitis B vaccine in all of the patients, not due to infection.

## Conclusion

The results showed the efficacy of hepatitis B vaccination in hemodialysis patients, but these patients need follow-up testing.

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