

SEROCONVERSION AND IMMUNOGENICITY AFTER HEPATITIS B VACCINATION IN HEMODIALYSIS PATIENTS

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OBJECTIVES

HBV infection is actually a worldwide disease among chronic hemodialysis patients, as a result of a cross-reaction contamination and high HBV-DNA serum prevalence in HBsAg+ patients.

As long as all the primary prevention programs have been carried out, vaccination becomes the leading treatment in order to decrease HBV-morbidity, so frequent in this group of patients.

Clinical trials regarding uremic patients undergoing HBV vaccination, have shown, comparing to general population, lower seroconversion rates (50-74% vs 90%).

This delayed and weak response could be caused by malnutrition, anemia, uremic syndrome and immunological disorders, so that we can consider these patients as immunosuppressed.

The aim of the study was to evaluate the seroconversion among two groups of hemodialysis patients exposed to two different HBV-vaccine schedules and to investigate if there were differences between patients who had and had not an effective response.

METHODS

We observed a group of 141 patients (pts) who start haemodialysis (HD) from 2003 to 2010. The first group of 95 pts (group A), mean age 56 ± 17 a, 63 M and 36 F, were vaccinated for the first time with HBVAXPRO® 20 mg in 3 doses (0-1-6 months) intramuscularly (IM) during the dialysis.

The second group of 46 pts (group B) who started HD in 2010 (mean age 68 ± 10 a.) 24 M and 12 F, were vaccinated with 3 doses of HBVAXPRO® with the same timing of the group A but with a double dose (40 mg) by intradermal (ID) injection at the end of the dialysis.

None of the patients was vaccinated before, nor treated with steroids and all patients had a good nutritional parameters according to albumin and fats serum levels. The vaccine was a recombinant *Saccharomyces cerevisiae* derived HBV surface antigen adsorbed on aluminum hydroxyphosphate sulfate.

RESULTS

The immune response results assessed by blood levels of Ab to Hb surface 3-6-12 months after vaccination showed in group A a good Ab response at 6 months in 39 pts (41%) with a titre between 10 and 1000 IU/L (R) and no titre (<10 IU/L) in 56 pts (59%) (NR). In the group B we obtain a sufficient antibody response with values ranging from 13 to 139 IU/L at 6 months after vaccination in 20 pts (43.4%) (R1) and 26 pts (56.6%) were non responders with a titre <10 IU/L (NR1).

We didn't find any significant difference between R and NR, R1 and NR1 of the two groups regarding weight, sex, Hb, inflammatory and nutritional markers, dialysis adequacy (Kt/V), dialysis membrane (HF and LF) and T cells CD4+/CD8+ ratio. Only younger age seems to be associated with improved seroconversion in group A and in a group B ($p < 0.052$) vs elderly patients.

CONCLUSIONS

The weak response to HBV vaccination in haemodialysis patients seems to be independent from vaccine dose (20 or 40 mg), route of injection (IM vs ID), timing (during or at the end of HD session), type of dialysis and T cell setting (CD4+/CD8+ ratio).

To achieve a satisfactory protection in these population we have probably to use a booster dose of vaccine with an aluminium hydroxide adjuvants or vaccinate patients in predialysis (CKD 4-5) .

REFERENCES

- 1) Vaccine in chronic hemodialysis patients. American Journal of Kidney Disease, Vol 33, No 2 (Feb), 1999: pp 356-360
- 2) WH Lim, S Kireta, et al: Uremia impairs monocyte and monocyte-derived dendritic cell function in hemodialysis patients. Kidney International (2007) 72, 1138-1148
- 3) Krishnamurthy G, Kher V, et al: Low response to HbsAg vaccine in CRF patients is not due to intrinsic defect of B cells. Scan J Urol Nephrol. 2002; 36 (5): 377-82
- 4) Kong NCT, Beran J, Kee SA et al. :A new adjuvant improves the immune response to HB vaccine in hemodialysis patients. Kidney Int 2008; 73: 856-862
- 5) Karachocagil MK, Buzgan T, et al: Comparison of intramuscular and intradermal application of hepatitis B vaccine in hemodialysis patients. Ren. Fail. 2006; 28 (7): 561-5.
- 6) Propst T, Propst A, et al :Reinforced intradermal hepatitis B vaccination in hemodialysis patients is superior in antibody response to intramuscular or subcutaneous vaccination. Am J Kidney Dis. 1998 Dec; 32 (6): 1041-5
- 7) Gerald DaRosa, A. Loewen, et al: Stage of CKD predicts seroconversion after hepatitis B immunization: earlier is better. AJKD vol 42, No 6 (Dec), 2003: pp 1184-1192

