

Effect of Granulocyte Macrophage Colony Stimulating Factor on Hepatitis-B Vaccination in Haemodialysis Patients

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ABSTRACT

- **Objectives :** Haemodialysis patients often fail to respond to hepatitis B vaccination. There are various agents that can be used as vaccine adjuvant in chronic renal failure patients on haemodialysis. In this study, the adjuvant effect of granulocyte macrophage colony stimulating factor (GMCSF) is compared with that of control subjects.
- **Methods :** In this study, eight patients were started on 150 mcg of GMCSF subcutaneously 24 hours prior to intramuscular hepatitis B vaccination (20 mcg of genetically engineered vaccine at the same site). The antibody response to surface antigen (anti HBsAg) in these patients were compared with those of eight control subjects who received standard three doses of monthly 40 mcg of same hepatitis B vaccine.
- **Results :** In the control study, only two patients developed significant antibody response to surface antigen whereas seven of eight patients in GMCSF group developed significant antibody titres (> 10 IU/L). The sero-protection rate was 87.5% in GMCSF group and 25% in control group.
- **Conclusion :** This study shows that GMCSF offers significantly better seroprotection against hepatitis B compared to standard dose of vaccination in patients with chronic renal failure on haemodialysis. (JAPI 1999; 47 : 602-604)

INTRODUCTION

Hepatitis B infection remains a major hazard in haemodialysis patients. All haemodialysis patients should be considered for vaccination. The response of vaccine in haemodialysis patients is poor and variable. There are various agents that can be used as vaccine adjuvant in chronic renal failure patients on dialysis such as erythropoietin, growth hormone, interleukin - 2 (IL-2), granulocyte macrophage colony stimulating factor, etc.¹ It has been shown that haemodialysis patients have a defect in macrophage function, that can be overcome by addition of IL-2.^{3,4} GMCSF is also believed to modify the macrophage function, through activation of antigen presenting cells, maturation of dendritic and langerhan cells. Its exact mechanism of action has not yet been studied.

In this study, the adjuvant effect of GMCSF for hepatitis B vaccination in CRF patients on dialysis was compared with that of control subjects with standard vaccine.

MATERIAL AND METHOD

A total of eight patients each in granulocyte macrophage colony stimulating factor and control group were taken for the study. Consecutive patients entering into haemodialysis programme were taken for this study.

Inclusion criteria - patients who would be on dialysis for a period of atleast 6 months.

The following lab parameters were within specified range, transaminase, alkaline phosphatase levels are less than three times of upper limit of normal, bilirubin less than 1.5 mg/dl, WBC count > 3000 cells/cumm and platelets more than 1 lakh/cumm. Patients on erythropoietin were also taken into study. But erythropoietin was not administered within 48 hours of GMCSF.

Previous administration of other investigational drugs or interleukin-2 was not permitted. None of the patient received immunoglobulin or transfusion between granulocyte macrophage colony stimulating factor doses and measurement of antibody titres at 4 weeks.

Exclusion criteria included, malignancy, pregnancy, presence of serum markers for hepatitis and critically ill patients.

The GMCSF group patients received 150 mcg of GMCSF subcutaneously day after first dialysis and one dose of hepatitis B vaccine 20 mcg intramuscularly at the same site. The anti-HBs antibody titres were measured 4 weeks, 8 weeks, 12 weeks and 6 months after vaccination.

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