

# Commonness of Blood-Borne Infections and Hepatitis B Immunization Status among Haemodialysis Patients in Focal Australia

## Abstract

A cross-sectional study of the prevalence of blood-borne viruses and hepatitis B vaccination status among Central Australian haemodialysis patients. 8.4% of patients had chronic hepatitis B infection, and 28.3% had serological evidence of human T-lymphotropic virus 1. HIV and hepatitis C were less common than 1% of the population. All 182 hepatitis B vaccine recipients' vaccination statuses were examined. 72.2% of patients who had received the vaccine at birth or in early childhood showed vaccine response. Before beginning their haemodialysis, 99 patients over the age of 20 had received the hepatitis B vaccine. 88.9% of these patients responded to the vaccine. After starting haemodialysis, vaccine-naïve patients who received the hepatitis B vaccine experienced a seroconversion rate of 78.5 percent.

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## Introduction

With 2956 cases per million people, the Northern Territory has the highest prevalence of haemodialysis-dependent end-stage kidney disease in Australia (ANZDATA), compared to 536 cases per million people in Australia. The 2019 ANZDATA Annual Report, 42nd Edition). With a land mass of 872,861 square kilometres and a population of 48,506 people, the catchment area for the Central Australian renal services covers two-thirds of the Northern Territory (Department of Health, Northern Territory 2022) [1].

Hepatitis B surface antigen (HBsAg) in the blood for more than six months is considered to be chronic hepatitis B virus (HBV) infection. The Northern Territory has the highest chronic HBV prevalence in Australia, at 1.7%, while Tasmania has the lowest (0.67%). In patients receiving haemodialysis in Western Europe and the United States, the prevalence of chronic hepatitis B ranged from 0% to 7%, with a prevalence of between 2% and 20% higher in developing countries than in developed ones. Occult HBV infection, which is defined as the presence of detectable HBV DNA in HBsAg-negative individuals with the potential risk of transmission during haemodialysis, reportedly

occurs at a rate of 1.3 to 3.8 percent in patients on haemodialysis [2].

## Methods

All 367 maintenance haemodialysis patients in Alice Springs and Tennant Creek were included in our cross-sectional study. Between January 1996 and December 2019, the patients began receiving haemodialysis. The study did not include renal transplant recipients or those on peritoneal dialysis who did not have stable graft function. At the beginning of their haemodialysis, each patient was tested for HBsAg, hepatitis B total core antibody (HBcAb), hepatitis B surface antibody (HBsAb), HTLV-1, HCV, and HIV serology. The Northern Territory's electronic clinical and laboratory reporting system was used to collect their serology results and clinical data. The primary care information system, a client-focused health information system made for remote health centers in the Northern Territory, was also looked at. The most recent retests and the HBV, HIV, HCV, and HTLV serology results from the beginning of haemodialysis were reviewed, and any differences between them were noted [3], [4].

In order to identify occult HBV infection, patients with isolated HBcAb positive results

underwent HBV DNA testing every six months. Every six months, follow-up tests for HBsAg, HIV, and HCV serology were performed. All haemodialysis patients were tested yearly for proof of HBV resistance with HBsAb titre. Patients received a second dose when the HBsAb titre fell below 10 IU/mL. The H-B-Vax II dialysis formulation (40 mg) was administered in three doses at 0, 1, and 6 months to all of the study's non-immune patients who had begun haemodialysis. HBsAb was measured six weeks after the last dose to determine the response. This study also looked at factors like age, gender, HTLV-1 co-infection, serum parathyroid hormone, and serum albumin that could affect how well people respond to hepatitis B vaccination [5], [6].

### Discussion

Patients on support haemodialysis for end-stage renal sickness ordinarily experience blood-borne viral diseases (Davies and Jabbar, 2012). According to our research, the prevalence of HBV among patients receiving hemodialysis in Central Australia was comparable to that of patients receiving hemodialysis in the Top End of the Northern Territory (41.9% vs. 42.7% HBcAb positive: (Davies and Jabbar, 2012) 8.4% versus 8.9% HBsAg positive) Similar low rates of HIV and hepatitis C were observed (1 percent versus 1.6%)[7].

According to the World Health Organization's criteria (MacLachlan and Cowie, 2015), the prevalence of chronic HBV (8.4%) falls into the "highly prevalent category," and it is likely that HBV infections occurred at birth or early in life for many of the patients in this study. There were no patients under 40 with chronic HBV infection; 11 were 51–60, 13 were 61–70, and 7 were 41–50 (Table 1). According to this age profile, the prevalence of chronic HBV infection decreased after the universal hepatitis B vaccination was introduced in 2000. Past examinations have shown that the commonness of ongoing HBV in the Northern Domain was 0.8% after the presentation of the hepatitis B immunization, while it was 14.2% for those brought into the world in the pre-immunization time (before 1988) [8], [9].

### Conclusion

Patients undergoing haemodialysis in Central Australia had low prevalence rates of other blood-borne viruses and high prevalence rates

of HBV and HTLV-1. Since the introduction of universal vaccination, the incidence of HBV infection has significantly decreased. Undergoing haemodialysis patients' responses to the hepatitis B vaccine were suboptimal and varied. If it is determined that Aboriginal people over the age of 20 do not have immunity to the hepatitis B infection, it is recommended, in accordance with ATAGI guidelines, to administer hepatitis B vaccines [10].

### Acknowledgement

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### Conflict of Interest

None

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