

Hepatitis B and C screening and linkage to treatment for inpatients with substance use or mental health disorders in a tertiary health service: a descriptive observational study



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Background

- The seroprevalences of hepatitis B (Hep B) and C (Hep C) among Australians with substance use or mental health disorders are 3.6% and 57.1% respectively¹.
- Their frequent admissions with these conditions provide opportunities for routine, targeted screening for hepatitis C².
- Targeted screening for Hep B and Hep C in people who inject drugs (PWID) and mental illnesses is cost-effective and can reduce liver disease burden^{3,4,5}.
- Australian guidelines have recommended targeted Hep B and Hep C screening for PWID and incarcerated persons^{6,7}.
- There is limited quantitative data on Hep B and Hep C screening and linkage to antiviral therapy for this patient cohort.
- This study aims to describe the demographics of persons hospitalised with substance use and mental health conditions, Hep B and Hep C testing and specialist referral frequency and determinants of testing at a tertiary health service in metropolitan Perth, Western Australia.

Methods

- Patients admitted to the Fiona Stanley Hospital (FSH) with substance use or mental health diagnoses between 1 May 2023 and 30 June 2024 were identified by reviewing Diagnostic Related Groups (DRGs) on WebPas, the electronic admission system.
- Included patients were manually screened for Hep B (HBs antigen, anti-HBs antibody) and Hep C (anti-HCV antibody, HCV PCR) testing from the pathology results portal, i.Clinical Manager.
- The electronic referral system, eReferral, was used to identify referrals of newly diagnosed patients to the Viral Hepatitis Clinics. Patients pre-existing referrals were included.
- Descriptive statistics were used to demonstrate patient demographics and Hep B and Hep C testing and referral rates.
- Associations between two categorical variables were analysed through the Chi-Square Test of Independence, and where appropriate, the Fisher’s Exact test, using SPSS Version 31, to determine predictors of Hep B and Hep C testing.

Results

- A total of 269 patients were included in the study.
- Patients admitted under the Mental Health service were deemed to have psychiatric problems as the primary diagnoses.
- Substance use conditions were regarded as the primary diagnoses when cases were managed in the Emergency Department and other non-Mental Health units.
- The results are summarised in **Tables 1, 2 and 3**.

Table 1 Demographic features of patients admitted with mental health or substance use disorders

Variable	Number of persons (%)		
	Substance use disorder, 110 (40.9%)	Mental health disorder, 159 (59.1%)	Total, 269 (100%)
Age, mean (years)	36.5	31.6	33.6
Gender			
Male	53 (48.2%)	88 (55.3%)	141 (52.4%)
Female	57 (51.8%)	71 (44.7%)	128 (47.6%)
Ethnicity			
Aboriginal, not Torres Strait Islander	21 (19.1%)	47 (29.6%)	68 (25.3%)
Neither	89 (80.9%)	112 (70.4%)	201 (74.7%)
Incarcerated			
Yes	7 (6.4%)	2 (1.3%)	9 (3.3%)
No	103 (93.6%)	157 (98.7%)	260 (96.7%)
Admitting specialty			
Emergency	100 (90.9%)	0	100 (37.2%)
Department			
General Medicine	7(6.4%)	0	7 (2.6%)
Mental Health	0	159 (100%)	159 (59.1%)
Other	3(2.7%)	0	3 (1.1%)
Admission type			
Elective	3 (2.7%)	24 (15.1%)	27 (10.0%)
Non-elective direct	5 (4.6%)	62 (39.0%)	67 (24.9%)
Emergency	102 (92.7%)	73 (45.9%)	175 (65.1%)

Emergency admission: Acute admission through the Emergency Department
Non-elective direct admission: Acute admission directly to the wards
Elective admission: Planned admission from community mental health or substance use disorder clinics

Table 2 Proportion of inpatients tested for Hep B and Hep C and referred for treatment

Variable	Number of persons (%)		
	Substance use disorder, 110 (40.9%)	Mental health disorder, 159 (59.1%)	Total, 269 (100%)
Hepatitis B testing			
Screening tests performed	37 (33.6%)	93 (54.5%)	130 (48.3%)
Positive HBs	0	0	0
Positive anti-HBc, anti-HBs > 10 U/mL	2 (5.4%)	4 (4.3%)	6 (4.6%)
Negative anti-HBc, anti-HBs > 10 U/mL	16 (43.2%)	32 (34.4%)	48 (36.9%)
Hepatitis C testing			
Screening tests performed	39 (35.5%)	89 (56.0%)	128 (47.6%)
Positive anti-HCV, undetected HCV RNA	4 (10.3%)	6 (6.7%)	10 (7.8%)
Positive anti-HCV, HCV RNA not done	5 (12.8%)	4 (4.5%)	9 (7.0%)
Positive anti-HCV, HCV RNA detected	2 (5.1%)	6 (6.7%)	8 (6.3%)
Referred to Viral Hepatitis Clinics			
Hep B	Not applicable	Not applicable	Not applicable
Hep C			
Positive anti-HCV, HCV RNA not done	0	0	0
Positive anti-HCV, HCV RNA detected	0	3 (50%)	3 (37.5%)
Total*	0	3 (30%)	3 (17.6%)

*Patients with detected anti-HCV but without HCV PCR being performed (either during index or prior admissions) are included with those who have detected HCV RNA, in the analysis of referrals to the Viral Hepatitis Clinics as the diagnosis of chronic hepatitis C remains to be confirmed.

Table 3 Variables which may influence Hep B or Hep C testing

Variable	Hep B or Hep C testing performed			p-value
	Done	Not done	Total	
Aboriginal status				
Yes	34 (50.7%)	33 (49.3%)	67 (100%)	0.805
No	99 (49.0%)	103 (51%)	202 (100%)	
Gender				
Male	67 (47.2%)	75 (52.8%)	142 (100%)	0.513
Female	65 (51.2%)	62 (48.8%)	127 (100%)	
Incarceration				
Yes	3 (33.3%)	6 (66.7%)	9 (100%)	0.502~
No	128 (49.2%)	132 (50.8%)	260 (100%)	
Admitting specialty				
Mental Health	93 (58.5%)	66 (41.5%)	159 (100%)	<0.001
Non-Mental Health	38 (34.5%)	72 (65.5%)	110 (100%)	
Admission type				
Elective	19 (61.3%)	12 (38.7%)	31 (100%)	0.005
Non-elective direct	41 (62.1%)	25 (37.9%)	66 (100%)	
Emergency	71 (41.3%)	101 (58.7%)	172 (100%)	

~ All statistical analysis has been performed using Chi-square Test of Independence, except for the variable ‘Incarceration’. For this variable, there are cells with expected counts less than 5, necessitating the use of the Fisher’s Exact Test.

Discussion

- About 2/3 of patients were admitted acutely (majority were substance users), ¼ were Aboriginals but only < 10% were incarcerated (**Table 1**).
- Just under 50% of all patients and 1/3 of substance users were screened for Hep B and Hep C (**Table 2**).
- No chronic Hep B cases were detected, about 1/3 of patients had been vaccinated whilst 5% had serologic evidence for naturally-acquired immunity (**Table 2**).
- Chronic Hep C was confirmed in only 6% of patients, whilst 8% had evidence of prior infection and 7% with detected anti-HCV had no HCV PCR (**Table 2**).
- Significant predictors of Hep B or Hep C testing include Mental Health, elective and direct admissions (**Table 3**).
- Our testing rates appear to be comparable a US Hep C study (50 to 60%) (12) but greater than an Australian trial of Hep C screening (18.6%)^{8,9}.
- The anti-HCV positivity rate (15%) and HCV RNA detection frequency (6%) were similar to the US and Australian cohorts^{8,9}.
- Unlike in the Australian study, custodial status and substance use disorder were not significantly associated with greater screening frequency⁸.
- As a limitation, patients with Hep B or C and admitted with other primary diagnoses, would have been excluded from this study. Moreover, Viral Hepatitis Clinic attendance data were unavailable.
- In the context of declining Hep C antiviral treatment rates since the introduction of direct-acting antiviral agents (DAAs), the hospitalisation of these patient groups should be capitalised upon for opportunistic and targeted screening¹⁰.
- The results should promote multidisciplinary interventions to improve local screening and treatment linkage rates, particularly for the acutely admitted substance use cohort.
- The ultimate aim would be to ensure that Australia’s 2030 Hep C elimination goals are reached.

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