

Neuropsychological problems and alcohol availability appear to be key factors in continued heavy alcohol use by Aboriginal Australians

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TO THE EDITOR: Significant morbidity and mortality are associated with excessive alcohol use, which, for Aboriginal Australians, generally occurs within a context of disadvantage. During 2007–2009, we assessed cognitive and psychological factors (using CogState¹ and Strong Souls² [CogState Ltd, Melbourne, Vic]) of 21 men and 11 women on admission to a 2-month Aboriginal residential treatment program in the Northern Territory. Participants' mean age was 32 years (SD, 8.7 years) and the mean length of time for which they had used alcohol was 13.3 years (SD, 7.7 years). To determine the effect of age, number of years of drinking and other factors on continued alcohol use, we reinterviewed and reassessed participants in their home community with the same cognitive and psychological measures used at the initial assessment after a mean period of 11 months (SD, 4.4 months). At both baseline and follow-up, the number of participants for whom data were available varied for some characteristics. The Human Research Ethics Committee of the Northern Territory Department of Health and Community Services and Menzies School of Health Research (including the Aboriginal Ethics Sub Committee) approved the study.

At baseline, 14 of 23 alcohol users reported drinking every day or most days, and 26 of 31 drank more than 10 standard drinks on each occasion. At follow-up in the community, 23 had resumed drinking at the same level, and nine had reduced their use (six had stopped using alcohol, and three had resumed drinking at lower levels).

Compared with users who reduced their alcohol intake, users who did not showed poorer paired associate learning at the time of admission for treatment, and poorer performance at follow-up in visual attention, learning and executive function, visual learning and recall, and paired associate learning tasks (Box). This suggests that while subtle cognitive impairment may be a risk factor for continued heavy alcohol use after treatment, heavy alcohol use is also a likely cause of additional cognitive deficits.³ While reduced alcohol use may be associ-

Characteristics of alcohol users who resumed drinking at the same level and those who reduced their alcohol use after a 2-month residential treatment program, at baseline and at follow-up (n=32)

Characteristic	Unchanged alcohol use, median	Reduced alcohol use, median	Z	Significance
No. of alcohol users	23	9		
Age at baseline, years	31.3	29.0	-0.15	ns
Years of drinking, at baseline	13.0	11.6	-0.59	ns
Visual attention, speed (log transformed)*				
Baseline	2.81	2.76	-1.67	ns
Follow-up	2.79	2.71	-2.10	P=0.04
Working memory, accuracy (arcsine transformed)†				
Baseline	0.70	0.70	-0.19	ns
Follow-up	0.80	0.74	-0.53	ns
Psychomotor speed, moves per second†				
Baseline	0.77	0.95	-0.35	ns
Follow-up	1.17	1.37	-0.75	ns
Learning and executive function, moves per second†				
Baseline	0.44	0.47	-0.39	ns
Follow-up	0.58	0.76	-2.32	P=0.02
Visual learning and recall, moves per second†				
Baseline	0.48	0.46	-0.21	ns
Follow-up	0.73	0.84	-2.20	P=0.03
Paired associate learning, duration (seconds)*				
Baseline	307.81	214.11	-2.52	P=0.01
Follow-up	286.51	168.48	-2.67	P=0.008

ns = not significant; P > 0.07. * Higher values indicate poorer performance. † Higher values indicate better performance. ◆

ated with improvements in cognitive function, continued use may lead to further cognitive decline.

Alcohol users who resumed drinking at the same level were significantly more likely to experience the psychological symptom "worry" after treatment (4/6; Fisher exact test, P < 0.05) than were users who reduced their alcohol use (0/6), which suggests that alcohol may have been used for self-medication or that excessive alcohol use may mask underlying psychological problems. Interestingly, a greater proportion of alcohol users who resumed drinking at the same level (10/16) were also using cannabis at follow-up, compared with those who reduced their use (1/9; Fisher exact test, P < 0.05). Cannabis use has been independently associated with psychological symptoms in other Australian studies, but with no impact on cognition.^{2,4} Our data indicate that there is a need to treat mental health problems concurrently with alcohol misuse problems among alcohol users undergoing treatment.

Alcohol users who resumed drinking at the same level were less likely to return to remote communities with restricted alcohol availability (11/23), compared with those who reduced their alcohol use (9/9; Fisher exact test, P < 0.01), lending some support to the effectiveness of alcohol restrictions.

Overall, our data show that cognitive problems and alcohol availability may be underlying factors in ongoing alcohol misuse by Aboriginal Australians.

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Competing interests: Paul Maruff is one of the founders of CogState, the company that sells the cognitive tests used in this study.

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- 1 Dingwall KM, Lewis MS, Maruff P, Cairney S. Reliability of repeated cognitive assessment in healthy Indigenous Australian adolescents. *Aust Psychol* 2009; 44: 224-234.
- 2 Dingwall KM, Cairney S. Detecting psychological symptoms related to substance misuse among Indigenous Australians. *Drug Alcohol Rev* 2010; 16 Apr (online ahead of print).
- 3 Rosenbloom MJ, Pfefferbaum A. Magnetic resonance imaging of the living brain: evidence for brain degeneration among alcoholics and recovery with abstinence. *Alcohol Res Health* 2008; 31: 362-376.
- 4 Clough AR, d'Abbs P, Cairney S, et al. Adverse mental health effects of cannabis use in two Indigenous communities in Arnhem Land, Northern Territory, Australia: exploratory study. *Aust N Z J Psychiatry* 2005; 39: 612-620. □