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Changing the minimum legal drinking age - its effect on a central city Emergency Department

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Abstract

Aims. To quantify the effect of a recent national law change on the presentation of ethanol intoxicated patients to a central city Emergency Department (ED).

Methods. All records of ethanol intoxicated patients presenting to the ED for twelve months before and after the change to the minimum legal drinking age were studied. Each patient was classified as having laboratory confirmed intoxication, clinical suspicion only, or no record of intoxication. Three age groups were identified, 15-17 year olds, eighteen and nineteen year olds and over 20 year olds. Within each age group the proportion of presentations with ethanol intoxication was compared across the two time periods.

Results. The number of intoxicated 18 and 19 year olds increased in the twelve months after the national law change from 66 to 107 (52 to 80 for laboratory confirmed intoxication and fourteen to 27 for clinical suspicion only). This represented an increase in the proportion of presentations in this age group with intoxication (p=0.009) from 2.9% to 4.4%, a 50% increase (RR=1.51, 95%CI 1.11-2.03). There was no evidence of an increase in the proportion intoxicated for those over nineteen years (3.4% vs 3.3%, p=0.48, RR=0.97, 95%CI=0.89-1.06) although the numbers increased slightly (963 to 992). However there was a worrying trend for an increase in the 15-17 year olds, with numbers increasing from 72 to 95 and the proportion increasing from 5.0% to 6.7% (p=0.07, RR=1.35, 95%CI=0.98-1.88).

Conclusion. The recent lowering of the minimum legal drinking age from 20 to eighteen years has resulted in increased presentations to the ED of intoxicated eighteen and nineteen year olds. A similar trend was seen in the 15-17 year olds.

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Auckland Hospital is a 500-bed facility that caters for most tertiary referrals. The Emergency Department (ED) is an adult-only unit (over fifteen years) receiving approximately 42 000 attendances per annum. The Auckland Public Health quarterly report consistently confirms that ethanol intoxication is the commonest overdose presentation to the ED.[1]

On 1 December 1999, legislation came into effect changing the minimum legal drinking age from 20 to eighteen years. Eighteen and nineteen year olds could now buy ethanol in bars, restaurants, wine shops and supermarkets. This study assesses the effect that this legislation has had and continues to have on the ED.

Methods

This was a retrospective observational study.

Inclusion criteria. All patients presenting to the ED were eligible for inclusion in the study.

Exclusion criteria. The only exclusion was for incomplete data. 624 study patients were excluded, as their records were incomplete for age, date of presentation or date of birth. This represents less than 1% of the 66 280 patients seen over the study period and 12% of those 5132 patients with laboratory ethanol levels or clinical suspicion of intoxication.

Data collection. There were three data sources used. Firstly, the presenting complaints, as accepted by the triage nurse, and discharge diagnosis given by the attending ED doctor were recorded in the electronic case management system utilised in the ED Computerised Hospital Integrated Patient System (CHiPS®A+). This record was searched using the terms 'ethanol', 'alcohol' or 'intoxication' and a file of 1308 (Table 1) records was created. The second data collection method relied on the attending ED doctor to collect demographic data regarding each overdose on a standardised collection form. The forms were collected each day and checked to ensure completion. Missing data were later entered retrospectively from the written medical record, giving a higher detection rate than for the CHiPS®A+ system alone. Thirdly, the laboratory database was searched for all ethanol levels for the corresponding period. This provided 4075 records (Table 1) that had a complete data set, of which 1862 showed an ethanol level of ≥17 mmol/L. These records were merged with those from the previous two collection methods yielding a total of 2295 records (Table 1).

875 patients were captured by both the clinical and laboratory data collection methods and were included only once for analysis. This allowed some assessment of the accuracy of clinical opinion regarding the patient's level of ethanol intoxication (Table 1). Of the 875 records, 154 had an ethanol level <17 mmol/L and were regarded as not intoxicated.

Chi squared tests (with Yate's correction) were used to determine whether there was an association between the ratio of intoxicated patients presenting before and after the law change. This was performed for three separate age groups: <18, 18-19 and >19 years.

Table 1. Presentation to the Emergency Department with suspected ethanol intoxication 1.12.98-31.11.2000.

	Total	Ethanol <17 mmol/L	Ethanol ≥17 or clinical suspicion	Not Recorded Not Requested
Lab Data	4075	2139	1862	74
Emergency Data	1308	154	1154	n/a
Matched entries	875	154	721	n/a
Total for analysis	4508	2139	2295	74

Results

The number of intoxicated eighteen and nineteen year olds increased in the twelve months after the national law change from 66 to 107 (52 to 80 for laboratory confirmed intoxication and 14 to 27 for clinical suspicion only). This was a significant increase in the proportion of presentations

in this age group with intoxication (p=0.009) from 2.9% to 4.4%, a 50% increase (RR=1.51, 95% CI 1.11-2.03). There was no evidence of an increase in the proportion intoxicated for those >nineteen years (3.4% vs 3.3%, p=0.48, RR=0.97, 95% CI=0.89-1.06) although the numbers increased slightly (963 to 992). However, there was a worrying trend for an increase in the 15-17 year olds, with numbers increasing from 72 to 95 and the proportion increasing from 5.0 to 6.7% (p=0.07, RR=1.35, 95% CI=0.98-1.88), Table 2.

When intoxicated presentations were stratified by laboratory data and clinical suspicion data, there was still a significant difference in the ratios of presentations in the key eighteen and nineteen year age groups (p=0.023 and 0.009, Table 2).

Discussion

The opportunity to perform this type of study is rare. To our knowledge this is the first New Zealand study to statistically corroborate anecdotal evidence supporting a significant increase in the presentation rate of ethanol intoxicated eighteen and nineteen year old patients.

There are limitations to the information. We believe that not all patients presenting with intoxication were captured by the existing data collection systems. Importantly, however, there were no differences in data collection techniques and no difference in training given to staff during the study period so it is envisaged that this would minimise the introduction of bias. There is evidence to support this assumption. In the year prior to the law change 123 of 2271 patients aged eighteen and nineteen were tested for level of ethanol intoxication. In the year following, 157 of 2446 patients were tested. This difference did not reach statistical significance (p=0.145). Furthermore 42% of those 123 tested prior to the law change had a level consistent with significant intoxication compared to 51% of the 157 tested afterwards. This also supports the assumption that staff were not testing more patients after the law change. Of the 875 records where a laboratory level was obtained to correlate with clinical suspicion of intoxication, only 154 records were found to be under the legal driving limit. This shows that laboratory levels confirmed significant intoxication 82.4% of the time when a laboratory level was requested.

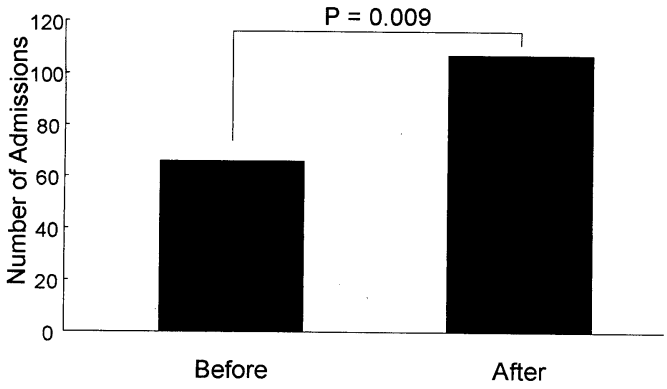

Figure 1. Ethanol intoxicated 18 and 19 yr old admissions before and after 1 December 1999.

The low total number of intoxicated patients may reflect the attitude of ED clinical staff to a significant public health problem. Cherpital et al[2] showed that 91 of 988 representative patients were found to have an ethanol-related ED visit but only ten of these were identified as having an ethanol problem by ED staff with only one referred for ethanol treatment. It may well be that ethanol as a factor in presentation is often overlooked or not considered for further action. The apparent trend toward newer classes of drug intoxication may be reducing the emphasis placed on ethanol abuse by EDs and the public in general.

The importance of research, in particular quality local research, to form part of the policy debate regarding ethanol legislation cannot be overestimated. It has been identified by Wagenaar[3] that good research in this area can, and does, influence policy debate. In a review, Casswell et al[4] stated "there is a lack of directly relevant local research to inform the policy debate". There is no doubt that ongoing local research will add validity to argument in this important area of public debate.

There is little doubt that ethanol consumption and the legislation affecting it has an effect on morbidity and mortality. Douglass and Millar[5] published compelling evidence linking ethanol and road traffic crashes in Michigan. After reduction in the drinking age to eighteen years in 1972 there were "at least 4600 additional road traffic crashes, in the 18-20 year age group, associated with ethanol from 1972-1975". MacKinnon and Woodward[6] published results comparing states that had raised the minimum legal drinking age and those that had not. In those states with a new higher minimum legal drinking age there were "significant immediate reductions in fatalities among younger drivers".

Muller[7] produced work suggesting that an increase in per capita ethanol consumption can be linked contemporaneously to an increase in hospital admission rates. This study looked at 42 community hospitals across five decades. Whereas our study does not show an increase in ethanol consumption in the 18-19 year age group there

Table 2. Presentations before and after the law change.

Age	Intoxication	Before	After	p-value*	p-value†
15-17 yrs	Lab confirmed	49	70		
	Clinical suspicion only	23	25		
	Total intoxicated	72 (5.0%)	95 (6.7%)		
	Not intoxicated	1362	1329	0.125	0.072
18-19 yrs	Lab confirmed	52	80		
	Clinical suspicion only	14	27		
	Total intoxicated	66 (2.9%)	107 (4.4%)		
	Not intoxicated	2205	2339	0.023	0.009
>19 yrs	Lab confirmed	800	811		
	Clinical suspicion only	163	181		
	Total intoxicated	963 (3.4%)	992 (3.3%)		
	Not intoxicated	27478	29272	0.571	0.48

*p-value calculated with three intoxication categories (df=2). †p-value calculated for lab and clinically suspected intoxication combined.

is local work to support this proposal. Casswell and Zhang[8] published a longitudinal study showing that an adolescent's access to ethanol was a powerful determinant of the quantities of ethanol drunk, more powerful than peer or parental influences. These data support our finding that increasing the minimum legal drinking age may well have increased the rate of ED attendance.

Not all international work supports our findings. Two studies from the UK suggest otherwise. Graham et al[9] published data from a six week study from an ED in Edinburgh showing no change in ethanol or assault related presentations following some restrictions placed on extensions to permitted licensing hours. Rhodes et al[10] found no overall change in presentation rates to an ED in Newcastle after liberalisation of the drinking laws allowed "all-day drinking". Neither of these studies, however, looked at age-related presentations and the Newcastle study did show a trend towards increased frequency of nighttime attendees.

Our study lends statistical weight to the body of opinion that suggests increasing the legal availability of ethanol to young people may well increase morbidity in that same group. By relying on measured blood ethanol concentration to identify cases, our study almost certainly underestimates the extent of hazardous drinking in the <20 year age group. Maio et al[11] demonstrated that up to 33% of patients <20 presenting to one ED admitted to ethanol use/misuse yet salivary ethanol levels identified only 5% of these patients. The blood ethanol level cut-off was set at the legal driving limit as a widely recognised level of impairment. However, this may well mean the findings in our study present a conservative view.

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Cancer institute director's exit leaves NIH in the lurch

Richard Klausner resigned on 11 September as director of the National Cancer Institute (NCI) to become president of the new Case Institute of Health, Science and Technology. The institute is bankrolled by Steve Case, the founder of America Online (AOL).

Klausner's departure after six years at the NCI accentuates the leadership void at the US National Institutes of Health (NIH). The biomedical research agency now lacks permanent directors both at its headquarters and at its largest institute – the NCI accounts for $3.7 billion of the NIH's $20.4 billion budget this year.

The positions are vacant at a time when the agency is facing several vexing issues, including the lack of a long-term strategy for managing its recent unprecedented expansion. There is also controversy over the government's role in funding human embryonic stem-cell research and growing concern about patient safety in NIH-supported clinical trials.

Sources inside and outside the NIH had been predicting Klausner's imminent departure for more than a month. They said Klausner and officials at the Department of Health and Human Services, the NCI's parent agency, were at odds over salary increases Klausner had given senior administrative staff and over travel by NCI staff to scientific meetings.

Klausner says that such issues "were not even a component" of his decision to resign. He attributes speculation about tensions between himself and health-department officials to "the internal rumour mill".

"Whenever an administration changes, these things come and go," he says. "But they were never in my mind as I was determining whether I should stay or go. There is a tendency for people to put forth their own issues when they're trying to explain events."

"I love this institution, but the reality is that the NIH director does not get closer to the science – he gets further from the science," Klausner says. "And what I was missing more and more was being close to the content".

Matthew Davis. Nature 2001; 413: 241.

A quick sniff could do wonders for your sex life

An aphrodisiac nasal spray that is more potent than an oyster and faster-acting than Viagra has been developed by researchers in the US. If clinical trials are successful, this "desire aerosol" could provide the first effective treatment for women who suffer from a low libido.

Tests on animals and people have shown that the experimental drug PT-141 made by Palatin Technologies in Edison, New Jersey, can stimulate desire and sexually arouse both sexes. But unlike Viagra, the target of PT-141 is the brain rather than the sexual organs.

PT-141 is a synthetic copy of a naturally occurring neuropeptide called α-melanocyte-stimulating hormone. MSH plays a role in stimulating sexual function and appetite. Within 10 to 15 minutes of squirting PT-141 up the nose, the drug activates melanocortin receptors in the hypothalamus region of the brain. This prompts the release of other sex hormones in a domino-like effect, says neuro-scientist Annette Shadiack, who directs the biological research at Palatin. "PT-141 triggers the centre where nature would normally start sexual behaviour," she says.

Shadiack and her colleagues at Concordia University in Montreal tested PT-141 on female rats and found that those on the drug actively engaged in foreplay and solicited sex from their male partners seven to eight times as often as the rats in the control group.

New Scientist, 3 November 2001.