

Survey

A retrospective survey of substance abuse in anaesthetists in Australia and New Zealand from 2004 to 2013

R. A. Fry*, L. E. Fry†, D. J. Castanelli‡

Summary

A questionnaire on substance abuse was distributed electronically to the heads of 185 Australian and New Zealand College of Anaesthetists accredited anaesthesia departments in Australia and New Zealand. The response rate was 57%. From January 2004 to December 2013, 61 cases of substance abuse were identified, giving an estimated incidence of 1.2 cases per 1000 anaesthetist years. Of 44 detailed reports completed, the majority were aged between 30 and 49 years, were male and of specialist grade. However, when corrected for gender and grade, the estimated overall incidence was higher in females and twice as high for trainees compared with specialists. When compared with prior surveys, the pattern of substance abuse in Australia and New Zealand appears to have changed significantly, with a notable increase in propofol and alcohol abuse and a decrease in reported cases of opioid abuse. Common presenting features of abuse included intoxication and witnessed abuse. Seventy percent of cases had more than one comorbid condition, most frequently either mental health or family problems. Only 32% of abusers had made a long-term recovery within the specialty. Death was the eventual outcome in 18% overall, with a particularly high mortality associated with propofol abuse (45%). Trainee suicide from all causes was reported at three times the rate of specialists. The findings indicate that substance abuse remains a significant problem in Australia and New Zealand and is associated with a significant mortality rate.

Key Words: substance abuse, professional impairment, chemical dependence, alcohol, drug abuse, suicide, death

Substance abuse by anaesthetists continues to be a significant problem, despite educational programs and increased vigilance by the profession^{1,2}. Substance abuse has been reported to be the commonest cause of physician impairment³ and recent publications continue to indicate a changing substance abuse profile worldwide, including an increasing trend towards the use of non-opioid drugs⁴⁻⁶. The aims of this retrospective survey were to update the pattern, incidence and associated risk factors of substance abuse in both anaesthetic registrars and consultants in Australia and New Zealand during the last ten years. This survey adds to, and compares with, the findings of the two previous ten-year Australian and New Zealand surveys published in 1993 and 2005^{7,8}.

Methods

The definition of an incident of substance abuse was the same as that used in a previous survey: "an anaesthetist who had come to the attention of the department as a result of suspected substance abuse and required some form of intervention"⁸.

The survey asked for retrospective data for the period between January 2004 and December 2013. The survey was conducted online using the INFORMZ electronic survey tool (Informz Inc, Saratoga Springs, NY, USA). It was administered and distributed via email to a current list of heads of departments of anaesthesia issued by the Australian and New Zealand College of Anaesthetists (ANZCA). Where necessary, recipients were encouraged to contact previous heads of department so that as much information as possible about substance abuse within the department over the ten-year period could be included. Non-responders were sent a reminder email after three weeks.

Approval for the conduct of this survey was obtained from the New Zealand Health and Disability Ethics Committees, Auckland Health Board Research Review Committee and the Monash University Human Research and Ethics Committee (Institutional approval Auckland City Research project A+ 6156, Health and Disability Ethics Committees 13/STH/184, Monash Ethics Certificate of Approval [MUHREC] CF14/568-2014000209).

The survey consisted of two parts. Part A required details on department demographics, number of known cases of substance abuse and information on any cases of suicide (Appendix A online). Part B required specific details of each individual case of known substance abuse (Appendix

* MBChB, DA, FANZCA, Consultant Anaesthetist, Department of Anaesthesia, Auckland City Hospital, Auckland, New Zealand

† Medical student, Monash Medical School, Monash University, Melbourne, Victoria

‡ MB BS, MClinED, FANZCA, Staff Anaesthetist and Supervisor of Training, Monash Health and Adjunct Lecturer, Department of Anaesthesia and Perioperative Medicine, Monash University, Melbourne, Victoria

Address for correspondence: Dr R A Fry. Email: RobF@adhb.govt.nz

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B online). If a respondent had multiple cases of substance abuse within their department in the last ten years, the respondent was required to fill out a Part B for each individual case. Questions from the previous study regarding a department's preparation and ability to deal with a case of abuse were withheld to simplify and shorten the survey but a single question about the appointment of a welfare officer was included.

Demographics of anaesthetists in Australia and New Zealand between 2004 and 2013 were obtained from ANZCA. Non-fellows were therefore, not included.

Results

Results are reported as numbers and percentage unless otherwise stated. No inference from our sample as to the true population incidence has been made, as our study is a retrospective survey.

Over this third ten-year study period, there was an increase in the total number of anaesthetists and an increased contribution of female fellows and trainees to workforce numbers. The most recent ANZCA Fellowship Survey (2010) indicated that 17% of anaesthetists were working purely in private practice at that time and hence excluded from this survey of training institutions⁹. The population our survey sampled is thus 17% smaller than the figures we have obtained from ANZCA for the total number of fellows in Australia and New Zealand. Calculated frequen-

cies will therefore be underestimates of the population frequency, but to enable comparison with previous results we have not adjusted for this discrepancy.

Questionnaires were sent to 185 heads of department, from which 106 (57%) adequately completed responses were received. There was an even spread of reports over the range of departments, varying in size from small ones with less than ten anaesthetists to larger ones with over 50. In total, 61 cases were reported from 39 departments. Twenty-three (59%) departments reported a single case, 12 (31%) reported two cases, two reported three cases (5%) and two reported four cases (5%). Of the 61 cases reported, 44 cases contained adequate detail for further analysis.

Demographics of cases

Most reports received were for anaesthetists of consultant grade (59%), males (66%) and those aged between 30 and 49 years (75%) (Tables 1 and 2).

Incidence of abuse

Based on the 61 reported cases of substance abuse, this gave an overall incidence of 1.2 per 1000 anaesthetist years of observation (Table 3). The incidence of abuse was higher in trainees (1.5 per 1000 registrar years) than consultants (0.7 per 1000 consultant years). Females had a higher incidence of abuse (1.0 per 1000 female years) than males (0.8 per 1000 male years). The incidence in male and female trainees was similar.

Substances abused

Propofol was the most commonly abused substance, implicated in 18 cases (41%), followed by opiates (32%), alcohol (27%) and benzodiazepines (16%). Recreational drugs were implicated in only two cases and inhalational agents identified included nitrous oxide and isoflurane. Of the opiates abused, fentanyl was the most common and was involved in 12 of the 14 cases involving opiates (86%). Pethidine, mor-

Table 1
Age and gender of substance abuse cases (n=44)

Age (years)	Total (%)	Male	Female
20–29	4 (9)	2	2
30–39*	23 (52)	13	9
40–49	10 (23)	8	2
50–59	4 (9)	3	1
>60	1 (2)	1	0
Age unreported	2 (5)	2	0
Total (%)	44 (100)	29 (66)	14 (32)

*One case aged between 30 and 39 had no reported gender.

Table 2
Cases by level of training (n=44)

Training level or grade	Total (%)	Male	Female
BTY	3 (7)	2	1
ATY	10 (23)	5	5
Provisional fellow	5 (11)	4	1
Consultant/VMO*	26 (59)	18	7

*One case of consultant/VMO had no reported gender.

BTY=Basic Training Years, ATY=Advanced Training Years, VMO=visiting medical officer.

Table 3
Estimated incidence of substance abuse

Category	Incidence (per 1000 anaesthetist years)
All anaesthetists (total cases, n=61)	1.2
All anaesthetists (completed cases, n=44)	0.9
All female anaesthetists	1.0
All male anaesthetists	0.8
All trainees	1.5
Female trainees	1.5
Male trainees	1.5
All consultants	0.7
Female consultants	0.7
Male consultants	0.6

Table 4
*Substances abused**

Substance	Total cases (%) (n=44)	Single substance involved (n=33)	Poly-substance abuse (n=11)
Propofol	18 (41)	13	5
Opiates	14 (32)	4	10
Alcohol	12 (27)	10	2
Benzodiazepines	7 (16)	1	6
Inhalational	2 (5)	2	0
Recreational	2 (5)	2	0
Other	1 (2)	0	1

*Some cases presented with more than one substance abused. Percentages are calculated with a denominator of cases=44.

phine and oxycodone abuse were also reported, often in combination with fentanyl.

Most cases of abuse only involved a single agent (75%), commonly alcohol or propofol. Poly-substance abuse was noted in 11 (25%) of cases. Males were involved in eight of these cases. Opiates were most commonly involved in cases of poly-substance abuse (91%), in conjunction with benzodiazepines and propofol. The most common drug implicated in female cases was propofol. Of the 14 reported cases of female substance abuse, nine involved propofol (64%) and in seven of these it was the sole agent abused. Of the 14 female cases, only two involved poly-substance abuse.

Of the 29 cases of male substance abuse, alcohol, opiates or propofol were equally involved, with nine cases (31%) each. Significantly, of 12 cases involving alcohol, ten (83%) were males and of 14 cases involving opiates, 11 (79%) were males (Table 4).

Presentation and identification

The most common presentation was some recognisable form of intoxication varying from alcohol on the breath to being in an unrousable state (Table 5). Other signs included witnessed abuse, absenteeism, abnormal behaviour and relapse. Death was the initial presentation in three cases (7%), two reported as suicide and one simply as death.

More than one precipitating cause or comorbid condition was identified in 70% of cases, the most frequently reported being mental health and family problems (Table 6).

Initial management

Joint supervision by the anaesthetic department, hospital management plus the medical council or medical board occurred in 16 cases (36%). The department intervened alone in five cases (11%), the medical authorities in four (9%), the hospital management alone in one and the police in one. The remaining four included other potential combinations, or no intervention as a result of mortality.

Table 5
*Presentations of substance abuse**

Presentation	n (%)
Intoxication	13 (30)
Witnessed/caught in act	8 (18)
Abnormal behaviour	7 (14)
Absenteeism	7 (14)
Incompetence	4 (9)
Relapse of previous substance abuse	5 (11)
Documentation	3 (7)
Death	3 (7)
Requested extra duties	1 (2)
Patient injury	0 (0)
Nil	1 (2)

*Some cases presented with more than one feature. Percentages are calculated with a denominator of cases=44

Table 6
*Comorbidities**

Identified comorbidities	
Depression	15
Anxiety	10
Family	7
Financial	4
Medical condition (not psychiatric)	1
Total	37

*Some cases had multiple comorbidities and 13 cases did not have any comorbidities reported

Treatment

In 31 cases (70%), treatment was conducted in an outpatient setting, compared to just five cases (11%) managed at inpatient facilities. A stand-down period of less than three months following substance abuse was reported in 40% of cases. There were no deaths amongst anaesthetists treated as inpatients compared to three deaths amongst those treated as outpatients.

Substance abuse outcomes

Thirty anaesthetists initially returned to some form of work (68%), with 24 (55%) returning to work in anaesthesia. Of those returning to anaesthesia, 14 (58%) made a full recovery; therefore 32% of substance-abusing anaesthetists successfully remained in their chosen career. Half the alcohol users continued to work in anaesthesia as opposed to about one third of opiate (36%) and propofol (28%) abusers.

Four abusers (9%) returned to work in an alternative medical career, but two had relapsed. Two worked for an unspecified time in non-medical capacities, and one relapsed.

Overall, this represented a 50% success rate for work outside of anaesthesia, although the numbers are too small to make inferences. Other outcomes included three early retirements (7%) and five dismissals (11%). Five of the reported cases were currently not registered or had been suspended by their medical board.

Death was the eventual outcome in eight cases (18%), with three identified as suicide and five as overdose. All eight deaths involved propofol and two (25%) included opiate abuse.

Suicide

Nineteen cases of anaesthetists committing suicide due to all causes (not necessarily related to substance abuse) were reported over the last ten years. Nine were male and ten were female. Significantly, of the ten females that committed suicide, eight (80%) were trainees and eight (89%) of the males were consultants. In this study, females had a higher incidence of suicide (0.7 per 1000 female anaesthetic years) compared to males (0.3 per 1000 male anaesthetic years). Furthermore, registrars had almost three times the rate of suicide (0.8 per 1000 registrar years) compared to consultants (0.3 per 1000 consultant years).

Department welfare officers

Welfare officers had been appointed in only 37% of departments. Of the 39 departments that reported cases of substance abuse, 45% had a welfare officer. In departments with no cases of abuse, 28% had a welfare officer.

Discussion

This study builds on the two previous substance abuse studies conducted amongst Australian and New Zealand anaesthetic departments^{7,8}. The results should be considered in the context of a number of limitations. This is a retrospective survey and thus only provides an indicative overview of the problem within the confines of this form of research⁹. The return rate achieved for this survey was only 57% and while this is reasonable for an electronic survey, it is substantially less than that received in the last two paper-based Australian and New Zealand surveys (both 78%). Furthermore, it is possible that approximately 17% of the consultant population is excluded due to working solely in private practice (P. Cargill, personal communication). It is well recognised that the incidence of substance abuse disorder is often underestimated and that it is difficult to comment on or compare results within the international literature, as information is limited and figures are determined using widely varying methodology¹. A reporting bias could also exist in that departments with a case of substance abuse might be more likely to submit a response.

The demographics of abuse were not dissimilar from previous surveys, with the overall incidence of substance abuse

of 1.2 cases per 1000 anaesthetist years comparable to the figure of 1.17 found in 2004, although this current study may underestimate the figure due to a poorer response. The rates of abuse amongst registrars also remains comparable at 1.49 per 1000 trainee years compared to 1.37 in 2004, but is substantially less than the incidence of 3.8 per 1000 registrar years from the survey published in 1993. Previous studies have quoted incidences for chemical abuse of 1% to 1.7% and new case rates of 0.1% to 0.4% per year for consultants and residents respectively^{10,11}. Berry et al simply estimated a rate of one anaesthetist per month for the United Kingdom¹². Warner et al reported a figure of 2.16 per 1000 resident years¹³. The incidence amongst trainees was essentially double that of consultants.

Incidence analysis by subgroup challenges traditional thinking, as it reveals a higher incidence amongst females compared to males. This provides a new insight into the risk profile of substance abusers and appears to be the first such report in anaesthesia. Female surgeons have previously been found to have almost double the incidence of alcohol abuse compared to their male counterparts¹⁴.

In line with international trends, propofol has increasingly become the agent of choice for abuse. In 1993, Weeks et al found induction agents were used in 6% of cases—propofol use was at 20% in the last survey (2005) and has risen to 41% of cases in the present study^{7,8}. The narrow margin of safety for propofol makes it a lethal drug, especially as escalation is common, with individuals recorded using up to 4 and 5 grams per day while continuing to work and mortality rates of up to 40% being reported^{15–17}. The mortality rate from propofol abuse (45%) appears to be the highest reported for anaesthesia providers to date and mirrors that noted internationally^{6,17}.

Opiate use has fallen from 66% to 31% of all cases, while alcohol abuse has doubled from 12% to 25% compared to the previous survey, in keeping with other population studies^{2,18,19}. It still differs markedly from the 59% reported by Berry et al, but may represent a reducing Australian and New Zealand tolerance of alcohol usage¹². Fentanyl is the most commonly reported opiate abused. There were no reported cases of remifentanyl abuse as opposed to three in the last survey.

There were only two cases of inhalational agent abuse reported, one of nitrous oxide and the other isoflurane, one of whom returned successfully to clinical practice. Although sevoflurane has been a substance of increasing abuse internationally, no cases were submitted for this drug⁵. The Welfare of Anaesthetists Special Interest Group is, however, aware that this substance was associated with the deaths of two anaesthetists during the survey period involving this agent, again highlighting under-reporting (D. Khursandi, personal communication).

Substance abuse recognition continues to be difficult and subjective, with denial by both the addicted individual and the observer common¹. Direct observation of abuse or its effects, such as intoxication or abnormal behaviour, were the most frequently reported methods by which cases were identified. Although incompetence, including poor documentation, featured in 14%, there were no recorded incidents of patient harm. This has been the feature of most publications, but harm is known to have occurred in several countries, including Australia^{20–22}. Death as the initial presentation (7%) was down from the previous survey (15%). This is higher than the 2% quoted in the UK, similar to the 7.2% finding by Menk et al, but much lower than the 18% (death or near-death event) reported by Booth et al^{11,12,23}. The many early subjective signs typical of substance abuse such as withdrawal, mood swings and weight loss were not a feature of this survey, but a case of requesting extra duties and another of frequent toilet visits were noted.

Sixty percent of the reported cases lacked detail of the duration of treatment or suspension from duty. There is increasing acknowledgement that some anaesthetists have been returned to work too rapidly and are unprepared for re-entry to the workplace, so this lack of information is a limitation of our results²⁴. For those treated for more than 12 months, however, 80% made a successful return to work compared to 43% and 33% for those treated less than six months and three months respectively. Although only 32% of substance-abusing anaesthetists successfully remained in their chosen career, this is an improvement on the 20% documented previously⁸. International experience and recommendations for opiate abuse advocate three months of inpatient care, a five-year minimum follow-up period and long-term depot naltrexone¹. In this context, it is intriguing that so many substance-abusing anaesthetists in Australia and New Zealand were treated as outpatients during this epoch. This may explain why there were no deaths amongst anaesthetists treated as inpatients compared to three deaths amongst those treated as outpatients. There is a shortage of addiction specialists and treatment centres in Australia and New Zealand, which would make it difficult to provide inpatient care and prolonged treatment as the documented successful international programs recommend. To quote Berge et al. "Successful PHPs [Physician Health Programs] should be celebrated, replicated, and *required* for addicted [anaesthesia care providers] who seek to return to health care employment"²⁵.

This survey indicates that the rehabilitation of substance-abusing anaesthetists in Australia and New Zealand may not be as successful as that achieved internationally, although our numbers are too small to make firm conclusions^{1,13,23}. There has been extensive debate in the anaesthetic literature as to whether substance-abusing anaesthetists should be given a chance to rehabilitate or whether they

should immediately be excluded from anaesthetic practice. Oreskovich, in a summary of the debate, concludes that rehabilitation is acceptable, provided the substance-abusing anaesthetist is assessed as an appropriate candidate for a successful return to anaesthesia²⁶. Based on the limited evidence available, family history of abuse or coexisting psychiatric disorder with major opioid abuse decrease the probability of successful rehabilitation. If these factors are not present and treatment includes a three-month residency program with monitoring for at least five years, accompanied by depot naltrexone for opiate abusers, rehabilitation is appropriate^{26,27}. Of note, given the increasing frequency with which it has been reported, propofol addiction was not specifically addressed in this review.

Compliance with treatment in chronic medical conditions is estimated to be between 30% and 60%, even under continuous medical supervision²⁸. It is likely that compliance among substance abusers will be similar, particularly when the duration of treatment is short. In order to improve the rate of successful rehabilitation and return to work, the evidence indicates these individuals should be actively managed by a special service and carefully monitored for the rest of their lives.

Since the last survey, the Welfare of Anaesthetists Special Interest Group has published an extensive collection of policies and guidelines on the ANZCA website to assist departments with welfare issues. A recent New Zealand survey, however, indicated only eight of the twenty District Health Boards reported they had a substance abuse policy document and only two were specific for the department of anaesthesia²⁹. The establishment of a welfare officer within all departments was first officially mooted ten years ago, in the 2004 Welfare of Anaesthetists' Resource Document RD16, but only officially defined and recommended last year in the Resource Document RD26^{30,31}. Our responses indicate that only 37% of Australian and New Zealand departments have appointed a welfare officer to date.

Increased restriction of access to medications has been reported to have no impact on the incidence of abuse, while potentially increasing the risk of a fatal outcome¹⁰. As access to opiates has become more restricted, there has been an international trend towards increased frequency of abuse of drugs that are easier to access^{5–7}. This survey indicates a similar trend, with an increase in mortality associated with abuse of these agents. User-identified electronic dispensing for all drugs using automated dispensers, such as the Pyxis MedStation system (Carefusion, San Diego, CA, USA), and random urine testing have been introduced in some institutions, but their true effectiveness has yet to be substantiated^{32–34}.

Regular drug testing is now commonplace within the mining and construction industries and has resulted in reduced accident rates³⁵. Similar random drug testing within the

medical profession has been suggested to optimise patient safety³⁶. Cost constraints and the complexity of testing for some of the commonly used substances make this scenario unlikely and a robust system for physician rehabilitation and care would be essential prior to its introduction.

Most studies indicate a higher rate of suicide in physicians compared to other professional groups, with a relative risk of 1.5 to 3.8 for males and 3.7 to 4.5 for females³⁷. Consistent with reported medical suicide, there is a higher incidence of suicide in younger females and older males in this survey^{38,39}. The 19 cases of non-accidental death reported is consistent with the 20 cases reported informally between 2004 and 2012 to the ANZCA Welfare of Anaesthetists Special Interest Group. However, that data indicates there were 14 male and six female cases¹⁹. The different demographics of the two groups indicate that these results may both underestimate this problem in anaesthetists, who have been highlighted as an at-risk group of doctors, with a relative risk of 1.45 for suicide and 2.21 for drug-related suicide compared to internists⁴⁰.

Conclusion

Ultimately, this survey raises more questions than it answers. Nonetheless, it indicates that substance abuse remains a significant problem in Australia and New Zealand, with a significant mortality rate. Although overall mortality may have declined, propofol has become a common agent of abuse and is associated with a high fatality rate. Standardised treatment protocols should be established, together with guidelines for return to work assessment and long-term follow-up with appropriate compulsory testing to ensure abstinence. Despite a large body of international literature concerning substance abuse in physicians, there is a lack of data regarding most aspects of this disease and no prospective investigations. As suggested in the conclusion of the last survey, provided confidentiality can be preserved, a prospective database supported by ANZCA with a follow-up system would certainly be advantageous in assisting future management planning for anaesthetists with this disease. Improved awareness of the problem through ongoing education, appropriate policies and mentoring in all anaesthetic departments cannot be emphasised strongly enough.

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