

# Patients presenting with fresh trauma after interpersonal violence

## Part I. Alcohol and substance abuse

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**Background.** Patients presenting with fresh trauma frequently have evidence of substance abuse. Nevertheless, few South African studies have measured the levels of both alcohol and other substances in patients presenting with fresh trauma after interpersonal violence.

**Methods.** A representative sample of patients presenting with fresh trauma to the Trauma Unit of Tygerberg Hospital was selected for study. Subjects were questioned about the nature of the trauma and breath alcohol concentrations were determined. Blood and urine samples for analysis of alcohol and other substances were obtained from approximately half the subjects.

**Results.** Alcohol was found to be present in a majority of patients who presented after interpersonal violence, while other substances were present less commonly. There was a high correlation between clinical history of alcohol use, breath analysis of alcohol and blood alcohol measurement.

**Conclusions.** Alcohol use plays a significant role in trauma due to interpersonal violence. It is essential to screen victims of interpersonal violence for a history of alcohol and other substances. Breath analysis for alcohol is a useful adjunct to clinical screening.

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Interpersonal violence in developing countries, including South Africa, is increasingly being seen as a public health priority.<sup>1-6</sup> Such violence is a major cause of mortality and morbidity, resulting not only in physical trauma but also in psychological trauma.<sup>7,8</sup> There is a pressing need to research the epidemiology and phenomenology of interpersonal violence in our society in order to help reduce its enormous personal and socio-economic burden.

In view of the strong association between traumatic injury and substance use,<sup>9-11</sup> an immediate question concerns the role of alcohol and other substances in interpersonal violence. While there is good evidence that the association between traumatic injury and substance use holds true in South Africa,<sup>12-20</sup> there is relatively little data here on the specific association between interpersonal violence and substance use.<sup>21-25</sup>

One window for research on interpersonal violence is provided by the study of patients presenting for treatment of fresh trauma. Studies of fresh trauma in South Africa have provided detailed information about the nature of traumatic injuries in urban and rural settings and have pointed the way to specific interventions to prevent such injuries.<sup>23,26-28</sup> In this study we aimed to collect data on alcohol and other substance use in patients with fresh trauma after interpersonal violence.

## Methods

Subjects were recruited from the Trauma Unit at Tygerberg Hospital. All subjects gave informed written consent for the study. The study procedures were carried out by four research nurses who had undertaken specific training in the methods of the study, including a pilot data collection period.

The procedure for subject recruitment aimed to select a representative sample of patients attending this tertiary setting. Sampling took place during 14 days, which were spread out over a period of 2 months so as to include each day of the week twice and so as to include days at the beginning, middle and end of each month. On each of the 14 study days, every 10th adult patient was invited by a research nurse to participate in the study. Where the patient refused to do so, or was unable to give consent, the 11th adult patient was invited to participate.

Each subject was interviewed with the Rural Injury Surveillance Study (RISS) questionnaire.<sup>27</sup> This questionnaire was designed for use in the South African setting and appears to constitute a reliable and effective method of obtaining data on traumatic injury.

Breath samples for alcohol analysis were obtained whenever possible by means of the commercially available Lion Alcolmeter S-D2. In addition, in every alternate subject, blood was drawn for analysis of alcohol levels. In this group of subjects an attempt was also made to obtain urine for analysis of amphetamine, cannabis, cocaine and methaqualone, opiate and phencyclidine content. Analysis was performed with the commercially available TDxFLx system, which relies on fluorescence polarisation and competitive binding immunoassay technology.

## Results

**Demographics of the sample.** One hundred and ninety-six subjects (139 men (70.9%), 57 women (29.1%)) were recruited into the study. This indicates that over a 28-day period, the Tygerberg Hospital Trauma Unit sees in the region of 3 920 adult patients, a figure which is consistent with hospital records.

Mean age of subjects was  $35.4 \pm 14.3$  years. Racial groups included coloureds (157 (80.9%)), blacks (19 (9.8%)), and whites (18 (9.3%)). Subjects were categorised as employed (93 (52.0%)) or unemployed (86 (48.0%)). Mean number of years of education was  $7.9 \pm 3.4$ .

Victims of interpersonal violence comprised 113 of the 196 (57.7%) subjects. Remaining subjects presented after other kinds of trauma including motor vehicle collisions (18), falls (36), burns (6) and sports injuries (5). Demographic characteristics of the patients presenting after interpersonal violence were tabulated (Table I).

**Table I. Demographic characteristics of patients with fresh trauma after interpersonal violence**

	Interpersonal violence	Other trauma	Significance
Age (yrs)	$31.5 \pm 9.1$	$43.6 \pm 19.2$	$P = 0.03$
Sex			
Male	84/113	53/79	NS
Female	29/113	26/79	
Race			
Coloured	99/112	57/78	$P = 0.0001$
Black	12/112	7/78	
White	1/112	14/78	

**Clinical and laboratory assessment of alcohol and substance use.** Alcohol was clinically assessed to be involved in 76/109 (69.7%) cases of interpersonal violence and in 24/77 (31.2%) of other cases ( $\chi^2 = 27.0$ ;  $P < 0.0001$ ). Similarly, breath alcohol tests were positive in 54/86 (62.8%) of interpersonal violence cases and 18/55 (32.7%) of other cases ( $\chi^2 = 12.1$ ;  $P = 0.0005$ ) (Table II). Blood levels of alcohol in victims of interpersonal violence ( $128.9 \pm 128.9$  mg/dl) were higher than in other cases ( $86.6 \pm 121.2$  mg/dl), but this finding did not reach statistical significance ( $t = 1.60$ ;  $P = 0.11$ ).

Other substances were clinically assessed to be involved in 6/105 (5.7%) cases of interpersonal violence and 2/72 (2.8%) other cases (not a statistically significant difference). A percentage of victims of interpersonal violence tested positive for cannabis, methaqualone and opiates, but none was found to have used amphetamines, cocaine or phencyclidine (Table II). Only in the case of opiates was there a tendency for positive results to be more frequently found in interpersonal violence than in other cases.

Breath alcohol levels correlated significantly with both clinical assessment of the trauma as alcohol-related ( $r = 0.29$ ;  $P < 0.001$ ) and with blood alcohol levels ( $r = 0.62$ ;  $P < 0.001$ ). Similarly, the presence of other substances in urine correlated significantly with clinical assessment of trauma as drug-related ( $r = 0.38$ ;  $P = 0.002$ ). These

correlations remained significant when only victims of interpersonal trauma were analysed.

**Table II. Presence of substances in patients with fresh trauma after interpersonal violence**

	Interpersonal violence	Other trauma	Significance
Breath alcohol	54/86	18/55	$P = 0.0005$
Blood alcohol	43/71	14/34	$P = 0.06$
Urine amphetamines	0/43	0/14	NS
Urine opiates	4/43	4/14	$P = 0.07$
Urine methaqualone	9/43	4/14	NS
Urine phencyclidine	0/43	0/14	NS
Urine cannabis	12/43	4/14	NS
Urine cocaine	0/43	0/14	NS

## Conclusion

Several important findings concerning substance use in patients with fresh trauma emerge from these data. First, alcohol is commonly present in such patients and plays a particularly important role in fresh trauma after interpersonal violence. Second, substances other than alcohol may also be present in both victims of interpersonal violence and patients with other kinds of fresh trauma. Third, in our sample there was a high correlation between clinical assessment of alcohol use, breath analysis of alcohol and blood alcohol measurement.

These findings are consistent with previous work in our trauma unit demonstrating that 77% of patients injured in assaults or motor vehicle collisions had positive blood alcohol levels.<sup>19</sup> Similarly, recent trauma studies in both urban and rural areas in the Cape show a strong association between clinical assessment of alcohol use and injury.<sup>26-28</sup> The importance of alcohol use in cases of interpersonal violence and other trauma patients has also been noted in other areas of the country.<sup>4,23</sup>

The data here are also consistent with previous South African mortality studies indicating an association between alcohol and fatal motor vehicle collisions<sup>13-16</sup> and between alcohol and drowning.<sup>18</sup> In perhaps the most comprehensive of these reports,<sup>25</sup> mortality data in the Cape Town area showed that alcohol consumption plays a significant role in death due to assault and other causes, with more than 56% of homicides, more than half of pedestrian and driver fatalities, 62% of fire fatalities and 31% of drownings testing positive for alcohol.

Previous research has also indicated that brief clinical assessment strategies can be used successfully to ascertain alcohol use in trauma patients.<sup>29</sup> Clearly, drug screening should be an important component of routine clinical care in trauma units. Unfortunately, even in developed countries, such screening is often neglected.<sup>30</sup> Our findings indicate that clinical assessment together with breath analysis of alcohol, a simple and inexpensive technique, currently provides a useful measure of substance use in trauma settings.

Several limitations of this study should be emphasised. Firstly, research nurses may have difficulty obtaining

information on alcohol and substance levels in particularly severe trauma cases — where urgent clinical attention is indicated — so that data presented may represent an underestimation of the true figures. Secondly, generalisation of our findings to other trauma units in South Africa is problematic. Our sample may have specific characteristics, such as substance abuse patterns and socio-economic features, which are not present in the same proportions in other populations. Indeed, generalisation of our findings to the issue of interpersonal violence as a whole is problematic. Trauma units may provide a useful but idiosyncratic window on such violence. For example, rape victims form only a small percentage of patients at our trauma unit, despite the fact that rape is currently an extremely common form of interpersonal violence in South Africa. Similarly, although abuse of a range of substances is seen in South Africa, alcohol is by far the most frequent substance present in those currently seen at trauma units.

Several goals for future intervention and research can be mentioned briefly. Firstly, the epidemiology of alcohol and substance use as well as the epidemiology of interpersonal violence in South Africa deserve ongoing attention. Several important surveys have shown that alcohol abuse is a highly prevalent problem in a number of our communities.<sup>31-36</sup> Ongoing work is necessary to monitor such substance abuse, particularly given the changing pattern of substance use recently documented in other parts of the world.<sup>37</sup> Trauma units provide an important setting for monitoring substance abuse and interpersonal violence, but given their specific limitations, other forms of monitoring data are also needed.

Secondly, education of our communities about the role of substances and other risk factors in interpersonal violence is a priority. Research in South Africa comparing imaginary constructions with forensic reconstructions of fatal violence has shown that at least some groups of lay persons significantly underestimate the likelihood that victims will have used alcohol.<sup>38</sup> Increased attention to the role of substance use in this context is therefore necessary.

The importance of a broad sociopolitical perspective in the combating of substance use has been emphasised by several authors.<sup>6</sup> Given the close association between alcohol use and socio-economic problems,<sup>31,34</sup> the importance of such a perspective is obvious. Furthermore, social attitudes toward alcohol and substances of abuse in South Africa are perhaps overly lax and need to be changed.<sup>39</sup> Finally, it may be argued that the courts also need to make an effort to alter attitudes towards alcohol and substance use.<sup>40</sup>

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