

# Routine pre-admission screening for a medical illness in aggressive patients who required sedation in the emergency department – necessary or not?

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*Objectives.* To determine the need for routine screening for exclusion of a medical illness causing or contributing to the aggression in aggressive patients who required sedation in the emergency department (ED). The value of the individual components of the screening process was also investigated.

*Methods.* The charts of 339 aggressive patients who presented at two general hospital EDs in Durban from January to December 2006 were retrospectively reviewed. Charts were analysed and the results of a screening protocol consisting of a psychiatric history, a physical examination and laboratory investigations were recorded on sheets designed for the study.

*Results.* The prevalence of a causal/contributory medical illness was 24.2%. Six patients (1.76%) with missed medical illnesses were inappropriately admitted to the psychiatric ward. The variables that emerged as significantly associated with a causal/contributory medical illness were an abnormal physical examination (odds ratio (OR) 42.151, 95% confidence interval (CI) 4.36 - 406,  $p < 0.001$ ), an abnormal full blood count (OR 2.363, 95% CI 1.08 - 5.13,  $p < 0.03$ ), and abnormal urea and electrolyte levels (OR 3.531 (95% CI 1.3 - 9.55,  $p < 0.01$ ). These had sensitivities of 63%, 57% and 40%, respectively, for the identification of a medical illness causing or contributing to the aggression. The sensitivity of the past psychiatric history was 28% and that of the random blood glucose level was 21%.

*Conclusion.* The prevalence of a causal/contributory medical illness in this study was significant and supports the need for routine screening. Abnormal findings on physical examination were the most sensitive component of the screening protocol and were strongly associated with a medical cause of aggression.

Aggression is defined as any verbal, non-verbal or physical behaviour that threatens or harms others or property.<sup>1</sup> Aggression can be a symptom of a psychiatric illness or a medical illness.<sup>2,3</sup> Psychiatric symptoms can be caused by a medical illness,<sup>4,8</sup> occur coincidentally with a medical illness<sup>7,9</sup> or be a consequence of a medical illness.<sup>10,11</sup>

All aggressive patients are therefore subject to mandatory screening for a medical illness by emergency department (ED) doctors in the EDs of Addington and King Edward VIII hospitals in Durban. ED doctors argue that screening is unnecessary because: (i) the prevalence of a causal medical illness in this setting is not known (there is a perception that the prevalence is so low that screening is not warranted); and (ii) the current screening protocol delays admission, increases the potential for injury to staff and patients, and adds to the patient load in a busy, resource-constrained ED (a doctor has to attend to more than 30 patients in an 8-hour shift at each of these two hospitals). Similarly, Jonsson *et al.*<sup>12</sup> reported that in the severely under-resourced ED at Chris Hani Baragwanath Hospital, Johannesburg, aggressive patients are sometimes referred to psychiatric services before a medical illness is excluded. This premature referral makes it difficult for patients to access medical care once they have been labelled as mentally ill.

However, observations from previous studies support screening because: (i) failure to screen may result in the admission of inappropriate medically ill patients to the psychiatric ward;<sup>13</sup> and (ii) aggressive, agitated patients undergo physiological changes such as dehydration and hypokalaemia which are not detectable or are easy to miss on physical examination.<sup>10</sup> Also, presentation to hospital is the first health care contact for many of our patients. Local primary health care clinics do not have the staff, facilities or transport available to manage aggressive patients.

The screening protocol at our hospitals consists of the taking of a psychiatric history, a physical examination, and routine laboratory investigations. The results of the screening laboratory investigations must be available before the psychiatric referral. This process usually takes up to 3 - 4 hours, but can sometimes take as long as 48 hours. Often patients are sedated, strapped to

mobile stretchers and left unattended in the ED while awaiting the laboratory results. If no medical cause of aggression is detected, the patient is referred to the psychiatric registrar on call.

Studies in North American and European populations have reported overall frequencies of laboratory abnormalities in patients with psychiatric complaints ranging from 0%<sup>14</sup> to 63%.<sup>5</sup> Published studies have variously supported comprehensive screening in all patients, screening in selected groups of patients, and no routine screening.

Korn *et al.*<sup>14</sup> reported a 0% yield for screening laboratory investigations if patients with pre-existing medical symptoms or history and new-onset psychiatric symptoms were excluded from the analysis. Henneman's group,<sup>15</sup> however, found that 63 of 100 patients in their study with new-onset psychiatric symptoms had an organic cause for the symptoms, and they recommended extensive screening including lumbar puncture, an electroencephalogram and a computed tomography scan of the brain in all patients. Gregory *et al.*<sup>9</sup> reported that yields from routine laboratory screening investigations varied substantially across studies. They recommended selective testing in the elderly, the homeless, and those with co-morbid medical illness, substance abuse and concurrent medical complaints.

No African studies were found reporting on the prevalence of medical illness or the value of screening laboratory investigations in the ED, i.e. before admission to the psychiatric ward. Abiodun<sup>16</sup> reported a 27.2% prevalence of physical illness in psychiatric inpatients in Nigeria, Janse van Rensburg and Van der Linden<sup>17</sup> reported that 26% of all the screening investigations performed on adult patients on their first admission to a psychiatric hospital were abnormal but only 4% of investigations led to any further action being taken, and Weinkove<sup>18</sup> noted that laboratory tests proved useful in the management of only 11% of patients.

In view of the paucity of existing local data, this study aimed to investigate the need for routine screening for a medical illness in aggressive patients who required sedation for behavioural control in the EDs of two general hospitals in Durban. The objectives of the study were to determine: (i) the prevalence of a causal or contributory medical illness in these patients; (ii) whether there was an association between the past psychiatric history, the findings on physical examination, the results of screening laboratory investigations and the cause of the aggression; and (iii) the sensitivities of the individual components of the screening protocol for the identification of a medical illness in the ED.

## Methods

The charts of aggressive patients who presented at the EDs of Addington and King Edward VIII hospitals, Durban, from 1 January to 31 December 2006, were retrospectively reviewed. The drug and daily patient attendance registers in the hospital ED were used to identify patients. All aggressive patients who presented to the ED and required intramuscular or intravenous sedation for behavioural control were included. Some patients presented to the ED more than once over the 12-month study period; each of these presentations was recorded separately. In- and outpatient charts were retrieved from the hospital registries and data were collected manually. Data sheets designed for the study were used to record information extracted from the patient charts. A history of psychiatric illness, the findings of the physical examination in the ED and the results of the screening laboratory investigations were recorded and used as independent variables in the analyses. The physical examination included a neurological examination, but this was not standardised. The final diagnosis after investigations in the psychiatric or medical ward were completed was used to determine the cause of the aggression and was used as the dependent variable in the analyses.

Only medical illnesses that caused or contributed to the aggression and that required medical intervention were recorded as medical causes. Pre-existing stable causal or contributory medical illnesses that did not require medical treatment and had been associated with a previous psychiatric admission, such as a head injury, were recorded as psychiatric causes. Substance withdrawal, in particular alcohol withdrawal with or without delirium, is managed in the medical wards of the study hospitals and is therefore recorded as a medical cause. Substance-induced disorder is recorded as a psychiatric cause because this condition is managed exclusively by psychiatrists.

SPSS version 15.0 (SPSS Inc., Chicago, Ill., USA) and EpiCalc (Brixton Books) were used to analyse the data. A  $p$ -value  $<0.05$  was considered statistically significant. Pearson's chi-square tests were calculated to assess associations between variables. Odds ratios (ORs) were calculated using univariate and multivariate binary logistic regression analysis. A stepwise backward selection method based on likelihood ratios was used in the multivariate logistic regression analysis, with entry and removal probabilities set at 0.05 and 0.1, respectively.

The study was given full approval by the Biomedical Research Ethics Committee of the Nelson R Mandela School of Medicine, University of Kwa-Zulu Natal. Requests for charts were made on

the basis of inpatient numbers. Once the charts were retrieved a study number was assigned consecutively to each one. Patient age and gender were recorded. No confidential or other information identifying patients was recorded.

## Results

A total of 442 patients were sedated with lorazepam, clothiapine, haloperidol or any combination of these drugs. Eighty-six of the 442 patients were excluded from the study because they were sedated for reasons other than aggression. The charts of 17 patients could not be traced through the inpatient registries because of incorrect recording of inpatient numbers or because charts were filed incorrectly. Complete data sets were available for 339 patients, and these patients were therefore enrolled in the study. The study group consisted of 234 males and 105 females. The mean age was 26.2 years (significant deviation (SD) 1.6), and the majority of the patients were in the 20 - 30-year age group. The oldest patient was 52 years old. Only 8% of the patients were referred to the hospital by a local clinic; they all had a past psychiatric history and no physical examination was recorded in the referral letters. Three patients (0.9%) were referred by private sector psychiatrists.

Of the patients 82 (24.2%) had a medical cause for the aggression (Table I), and 257 (75.8%) had a psychiatric cause. Three patients (0.9%) had causal medical illnesses that had been documented previously, did not require medical intervention, had previous psychiatric admissions and were included in the analysis as psychiatric causes.

Of 6 patients (1.8%) whose medical illnesses were missed, 1 had an acute subdural haematoma, 3 cryptococcal meningitis, 1 hyperthyroidism and 1 pulmonary tuberculosis. Fourteen patients (4.1%) were inappropriately admitted to the medical ward and had to be transferred to the psychiatric ward. All these patients had no abnormality on physical examination and were admitted to the medical ward because of an abnormal white cell count.

At the initial ED assessment, 36 of the 339 patients (10.6%) were assigned the label 'Known psych. patient', but this was found to be inaccurate when a more detailed history was obtained after

**Table I . Medical causes of aggression**

Diagnosis	No. of patients
Diabetes	2
Substance withdrawal	15
Hypertension	2
Hyponatraemia	1
Malaria	1
Epilepsy	31
Huntington's disease	1
Meningitis	19
Hyperthyroidism	1
Tuberculosis	6
Head injury (acute)	3
Total	82

admission. The association between past psychiatric history and cause of aggression was not significant ( $p>0.05$ ). However, patients with abnormal findings on physical examination were much more likely to have a medical cause of aggression. There was a strongly significant association between physical examination and cause of aggression (odds ratio (OR) 42.151, 95% confidence interval (CI) 4.36 - 406,  $p<0.001$ ), The past psychiatric history and physical examination had sensitivities of 28% and 63%, respectively, for the identification of a medical illness causing aggression.

Patients with an abnormal full blood count and urea and electrolyte levels were more likely to have a medical cause of aggression than patients in whom these were normal (Table II). Chi-square tests indicated a significant association between the full blood count (OR 2.363, 95% CI 1.08 - 5.13,  $p<0.03$ ) and urea and electrolyte levels (OR 3.531, 95% CI 1.3 - 9.55,  $p<0.01$ ) and the cause of aggression. These investigations had sensitivities of 57% and 40%, respectively, for the identification of a medical illness causing or contributing to the aggression. The sensitivity of the random blood glucose was 21%. An abnormal result was recorded as an abnormality in any or all of the individual components of the investigation. A clinically significant result was defined as a result that necessitated immediate treatment or that contributed to or confirmed the cause of the aggression. A positive screening test was regarded as an abnormal result on the test.

**Table II. Frequency of normal, abnormal and clinically significant laboratory results**

Investigation	Normal result (N (%))	Abnormal result (N (%))	Clinically significant result (N (%))
Full blood count	235 (69.3)	104 (30.7)	47 (13.9)
Urea and electrolytes	289 (85.3)	50 (14.7)	33 (9.7)
Random blood glucose	318 (93.8)	21 (6.2)	18 (5.3)

## Discussion

Almost one-quarter (24.2%) of the patients in this study had a causal or contributory medical illness, and this study therefore supports routine screening in the ED. This is a conservative estimate, as medical illnesses that were judged by the author to be co-morbid rather than causal or contributory, those that were undetected (e.g. HIV) and those that did not require medical intervention were excluded from the calculation of the prevalence of medical causes because screening was not necessary to identify those illnesses.

The prevalence of causal medical illness reported previously in patients presenting with psychiatric symptoms is variable, ranging from 2%<sup>6</sup> to 46%.<sup>3</sup> The prevalence of 24.2% in the present study is therefore more than double that previously reported, but half of the highest reported figure in the literature. This study confirms the previously reported observations of substantial variability across studies in different populations.<sup>8,9,16</sup> Poor, uninsured patients (similar to the patients in this study) with psychiatric symptoms who do not have access to routine medical care have been shown to have a particularly high prevalence of medical illness.<sup>15</sup>

Epilepsy and meningitis accounted for 67% of all the medical disorders in this study. This preponderance of central nervous system disorders in black African populations, as opposed to European and American populations, which cite cardiovascular system disorders as being most often responsible for medical morbidity in psychiatric patients, has been noted previously.<sup>16,19</sup> The increased frequency of HIV as a causal medical illness in this study (7.3% compared with 1% in Koran *et al.*'s study<sup>6</sup>) could be a contributory factor.

It is also evident from this study that an abnormal physical examination was the most sensitive component of the screening procedure and was strongly associated with a medical illness. A physical examination is quick and inexpensive. All mentally ill patients must at the very least be physically examined in the ED. Reluctance on the part of ED doctors to examine patients with psychiatric symptoms has been observed previously. Jonsson *et al.*<sup>12</sup> noted that physical examinations were often incomplete and not well documented in their ED, resulting in inappropriate admissions to the psychiatric ward.

Overall, the frequency of clinically significant laboratory investigations in this study was 9.6%. This figure is higher than that previously reported.<sup>14,15,20</sup> A probable explanation is that 92% of the patients in this study had had no health care contact prior to this presentation. The effectiveness of our screening procedure

is evidenced by the low percentage (1.8%) of missed medical illnesses.

Although the results of this study support screening, the question of who should perform the screening (ED doctors or the psychiatric registrar) remains unresolved. This is partly because: (i) psychiatric registrars in this province are not remunerated for on-site overtime; and (ii) there are no areas designated for the management of psychiatric emergencies in general hospital EDs which operate on a 24-hour basis (as is the case for every other major medical discipline).

Possible limitations of this study included the following: (i) the setting was limited to two EDs in one province and the results may therefore not be generalisable to other EDs with different screening and triage protocols; (ii) the frequency of causal medical conditions may have been under-estimated because HIV/AIDS was not routinely excluded. Only patients who gave informed consent were tested for HIV. In a study conducted at a local psychiatric hospital, Mashapu<sup>21</sup> reported a seroprevalence rate of 23.8% in patients with a first episode of psychosis; and (iii) substance-related disorders were excluded based on the history and clinical examination. Toxicology screens are not ordered routinely in our EDs.

The strengths of this study are that these results: (i) contribute to a growing demand for a local evidence base that informs the need for routine screening for a medical illness in aggressive patients in general hospitals EDs; (ii) show that physical morbidity in patients with psychiatric symptoms is an important consideration; and (iii) provide evidence for the continued recognition of psychiatry as a medical discipline and the establishment of 24-hour psychiatric services in general hospitals.

## Conclusion

Aggression is a symptom and not a diagnosis. It is suggestive but not diagnostic of a psychiatric disorder. Epilepsy and meningitis were the most frequent medical illnesses in this study. The 24.2% yield for a medical cause is supportive of the need for screening of all aggressive patients in the ED. The physical examination was the factor most strongly associated with the cause of aggression in this study, and should therefore be a mandatory component of any screening protocol.

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