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Presentation and frequency of catatonia in new admissions to two acute psychiatric admission units in India and Wales

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ABSTRACT

Background. There are no modern cross-cultural comparative studies of the frequency and clinical presentation of catatonia in a Western country and India using standardized rating instruments and diagnostic criteria.

Method. A total of 104 consecutively admitted patients in Wales and in India were screened for catatonic features using the same standardized rating instrument by the same psychiatrist to generate DSM-IV and other diagnostic criteria for catatonia, and a profile of signs in catatonia. Inter-rater reliability for the ratings made by the research psychiatrist was established with local psychiatrists at each unit.

Results. The frequency of DSM-IV criteria catatonia was 13·5% in India *versus* 9·6% in Wales (N.S.). The severity of catatonia did not differ between the two units. However, retarded catatonia was more common in India (12·5%) *versus* Wales ($p < 0{\cdot}05$) whereas the frequency of excited catatonia was equally common in both units. Catatonia was found in many different mental disorders not just schizophrenia and affective disorder.

Conclusions. Catatonia is commonly found among psychiatric in-patients with a similar frequency and severity but differing clinical presentations in Wales and India. Some classic signs of catatonia like posturing, catalepsy, staring and stupor were more frequent among psychiatric admissions in India than Wales. The differing clinical presentations may be due to differences in demographic features rather than cultural or aetiological factors.

INTRODUCTION

In 1874, Kahlbaum first described catatonia as a distinct psychiatric disorder (Kahlbaum, 1973). However, catatonia became mostly associated with schizophrenia by the middle of the 20th century (Lohr & Wisniewski, 1987; Rogers, 1992). Since the 1970s, catatonia has been increasingly viewed as a non-specific neuropsychiatric syndrome (Morrison, 1975; Abrams & Taylor, 1976; Gelenberg, 1976; Lohr & Wisniewski, 1987; Fink & Taylor, 1991; Fink, 1996), therefore, catatonia was accepted in DSM-IV as a disorder modifier in organic and affective disorder as well as schizophrenia (APA, 1995).

Reports up to the early 1970s suggested that catatonia was disappearing in psychiatric hospitals among developed countries (Morrison, 1975; Mahendra, 1981; Lohr & Wisniewski, 1987). However, these reports did not employ modern survey methods or utilize standardized diagnostic instruments and diagnostic criteria (Lohr & Wisniewski, 1987).

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The International Pilot Study of Schizophrenia (IPSS; WHO, 1973), carried out before modern rating instruments for catatonia and diagnostic classifications of mental disorder, reported a much higher prevalence of catatonic schizophrenia in the mental health services of India (Agra, India, 22%) than in Western countries (e.g. London, UK, 3%; Washington, DC, 1%). The high prevalence of catatonic schizophrenia in India may have been due to the inclusion of all motor disorders as features of catatonia (Rogers, 1992).

Over the last 30 years, surveys of psychiatric in-patient admissions from single centres around the world report a prevalence of catatonia of 7–18% (Abrams & Taylor, 1976; Rosebush *et al.* 1990; Pataki *et al.* 1992; Ungvari *et al.* 1994; Bush *et al.* 1996*a*; Lee *et al.* 2000; Fink & Taylor, 2003; Kruger *et al.* 2003; van der Heijden *et al.* 2005), with the exception of one small German study with a prevalence of 31% that was confined to patients with mania (Braunig *et al.* 1998). None of these studies was carried out in India and none compare consecutive psychiatric in-patient admissions in more than one country. On the basis of these studies the prevalence of catatonia does not seem to be disappearing. Therefore, we aimed to find out if the frequency, severity and clinical presentation of catatonia was similar or not in consecutive general adult psychiatry in-patient admissions to a centre in India and a centre in Wales.

METHOD

Study design

A cross-sectional survey of consecutive admissions was conducted in two psychiatric in-patient units at the Institute of Mental Health, Hyderabad, India and the Hergest Unit, Bangor, Wales, UK. Recruitment and screening the target number of patients took 60 days in Wales and 24 days in India. Each patient was screened using the Catatonia Screening Instrument (CSI) (Bush *et al.* 1996*a*) by a psychiatrist (P.C.) familiar with and linguistically fluent in both cultures. P.C. was trained in its use by an experienced research psychiatrist (D.H.) until full agreement on caseness was established in eight consecutive patients. The screening psychiatrist had a strictly observational role. The primary treating teams in both the settings made all the relevant patient management decisions from deciding on admission, assigning a diagnosis, and managing the patient.

Only an oral explanation of the study was given to the patient, rather than oral or written informed consent, because some patients with catatonia, e.g. those with negativism could not indicate whether they comprehended the study, while others could not write because of their motor symptoms. In this instance giving informed consent would seriously bias the results of the survey. The methodology was non-invasive and required a 10-minute physical examination and clinical observation, comparable with normal clinical practice, and anonymized data collection from the medical record. The local Ethics Committee and Trust managers in North Wales and the institutional Ethics Committee and Management Committee in Hyderabad accepted this argument and approved the project.

Study sites and subjects

The two acute psychiatric in-patient units selected for the study in Wales and India are both acute psychiatric admission units that admit adult patients (>18 years) with functional problems with no upper age limit. Inclusion criteria for the study subjects were consecutive admissions to each of the two psychiatric units. Exclusions are shown in Table 1.

Assessments

The Catatonia Rating Scale (CRS) (Bush *et al.* 1996*a*) was selected for use in this study because it is a standardized clinical examination and rating procedure that takes only 10 minutes to conduct. Hence it can be used with relative ease on a large number of patients in varied settings. The CRS is a 23-item instrument developed to measure the severity of catatonia. Individual catatonic features are rated as positive only if the psychiatrist is sure that they are definitely present. As recommended by Bush *et al.* (1996*a*), we supplemented the physical examination with a longer period of unobtrusive clinical observation, discussion of the presence of CSI/CRS signs with nurses and/or medical staff, and noted the recording of any of these signs in the medical record. A score between 0 and 3 is rated for each feature and hence the severity of

Table 1. *Consecutive admissions, frequency and clinical features of catatonia in each psychiatric in-patient unit*

Item	India	Wales	Statistic
Number patients admitted during the study period.	114	112	—
Number (%) of patients excluded from the study	10 (8·7%)	8 (7·1%)	—
Reasons for exclusion			
Learning disabilities	0	2	—
Diagnosed dementia at admission	0	1	—
Discharged within 24 hours	0	5	—
Lost for follow-up within 24 hours	8	0	—
Unable to understand an oral explanation of study	2	0	—
Number (%) subjects included in the final analysis	104 (91·2%)	104 (92·9%)	—
Patients (%) with positive features either screening	19 (18·3%)	18 (17·3%)	—
Patients with positive features <24 hours	0	2	—
Patients with positive features, scored <2 on CSI	3	2	—
Patients (%) met CSI diagnosis of catatonia	16 (15·4%)	14 (13·5%)	$\chi^2=0{\cdot}16$, df $=1$, $p=0{\cdot}69$
Patients (%) met CSI diagnosis of severe catatonia	15 (14·4%)	12 (11·5%)	$\chi^2=0{\cdot}54$, df $=1$, $p=0{\cdot}46$
Patients (%) meeting DSM-IV criteria for catatonia	14 (13·5%)	10 (9·6%)	$\chi^2=0{\cdot}75$, df $=1$, $p=0{\cdot}39$
Patients (%) Morrison retarded catatonia	13 (12·5%)	5 (4·8%)	$\chi^2=3{\cdot}98$, df $=1$, $p=0{\cdot}049$
Patients (%) Morrison excited catatonia	8 (7·7%)	7 (6·7%)	$\chi^2=0{\cdot}07$, df $=1$, $p=0{\cdot}79$
Mean (S.D.) score on CRS catatonia cases	8·8 (3·3)	7·9 (3·7)	Mean diff. $=1{\cdot}3$ (95% CI $-1{\cdot}7$ to $3{\cdot}5$, $p=0{\cdot}49$)

catatonia can be recorded. However, some of the classical features can be scored either as 0 (absent) or 3 (present). The first 14 items are truncated to form the CSI, a measure of the most frequent signs reported in the literature that are characteristic of catatonia (Bush *et al.* 1996*a*). Some items that might be misinterpreted as symptoms of catatonia but are frequently seen in catatonia, e.g. excitement, impulsivity are excluded from the CSI but are retained in the CRS to measure the severity of catatonia. The CSI is intended as a screening instrument but we gave the CRS to each patient screened. As recommended by the authors (Bush *et al.* 1996*a*), we used the presence of two or more positive features on the CSI to establish the diagnosis of catatonia. In previous research the inter-rater reliability for caseness on the CSI was 93%, for the total score on the CRS it was 88% and for individual items of the CRS it was 73% on items presenting 15% or more in the sample (Bush *et al.* 1996*a*).

The validity of the CSI criteria has not yet been established (Bush *et al.* 1996*a*). In particular the items withdrawal excitement and rigidity are non-specific. Therefore, in addition we diagnosed each case of catatonia using DSM-IV criteria for catatonia (APA, 1995) outlined in the criteria for schizophrenia and mood disorder. These narrower DSM-IV diagnostic criteria can be diagnosed using the CRS according to the authors (Bush *et al.* 1996*a*) and do not require withdrawal or rigidity for their definition. The DSM-IV criteria for catatonia (APA, 1995) require the presence of two of the following five items:

(1) Motoric immobility as evidence by catalepsy or stupor.
(2) Excessive apparently purposeless motor activity not influenced by external stimuli.
(3) Extreme negativism or mutism.
(4) Peculiarities of voluntary movement as evidenced by posturing, stereotyped movements, prominent mannerisms or prominent grimacing.
(5) Echolalia or echopraxia.

Catatonia can be classified into retarded and excited forms (Morrison, 1973). For this study, retarded catatonia is defined by the presence of two or more of the following features: mutism, negativism, staring, rigidity, and catalepsy. Therefore, all cases with retarded catatonia also met CSI criteria for catatonia. Excited catatonia is defined as meeting CSI criteria for catatonia plus the presence of one or more of the following: excitement, impulsiveness, and combativeness. Other items on the CRS that are seen in both retarded and excited forms of catatonia were ignored, e.g. echolalia and echopraxia.

A small feasibility study screening 35 in-patients at the Hergest Unit, Wales and 12 in-patients at the Institute of Mental Health, India was undertaken before the survey was started to understand all admission procedures and pathways to care to ensure that no admissions were missed.

The screening procedure was performed as soon as possible after the patient's admission by a research psychiatrist (P.C.). Most of the first screening examinations were done within 24 hours of admission; all were done within 48 hours. P.C. screened all the patients on a second occasion after another 24 hours (24–72 hours after admission). P.C. did not examine patients who were negative on both the screenings again. Sometimes patients were positive at one screening examination but not at the other. If any of the positive features were found, the screening was repeated in 24-hour intervals (48, 72 and 96 hours after admission) to determine if the catatonic features persisted for 24 hours or more to qualify for the diagnosis of catatonia. Patients who met the screening criteria for catatonia (CSI $\geqslant$ 2) on at least two out of three occasions were diagnosed with catatonia. When patients were screened in India, P.C. was not blind to the results in Wales. Therefore, cases in India were independently rated by a senior psychiatrist working at the in-patient unit in India, who was blind to the results in the first setting in Wales. Where there was a disagreement over rating an individual item on the CSI/CRS, the rating of the second local psychiatrist was used to maintain blinding.

The research psychiatrist collected information on the demographic features, duration of history, psychiatric diagnosis (clinical diagnosis, broad ICD-10 F category) (WHO, 1992), physical health (from history and examination) and medication of each patient from the case-notes of each patient. Where this information was missing in the case-notes, it was obtained directly from the clinical team, except for diagnosis, which was determined only by the responsible medical officer.

Power calculation and data analysis

At each unit 104 patients (total 208 patients) were required to detect a difference of 14% in the frequency of catatonia between India and Wales, using a two-tailed test at 5% significance and 80% power. Previous reports indicate that the prevalence of catatonia may be 8% in a psychiatric unit in a developed country (Bush *et al.* 1996*a*) and 22% in an Indian setting (WHO, 1973). The sample size permits the detection of a 0·39 effect size difference in the severity of catatonia between the two units, using a two-tailed test at 5% significance and 80% power.

Data was analysed using SPSS version 11.0 (SPSS Inc., Chicago, IL, USA). Categorical outcomes between the two samples were examined using χ^2 tests, and quantitative data that were in each case close to a normal distribution with independent *t* tests.

RESULTS

Inter-rater reliability of assessments in India and Wales

The inter-rater reliability, between the research psychiatrist (P.C.) and two other psychiatrists working in the in-patient unit in India, was established in a similar manner to the original report on the CSI/CRS (Bush *et al.* 1996*a*), i.e. simultaneous but independent rating of 28 randomly selected in-patients. The inter-rater reliability for caseness on the CSI and for DSM-IV criteria for catatonia was 96%, for the total CRS score within one point was 79%, and for the 10 items with a frequency of 15% or more was 68–100% with a mean of 85%. The two judgements where inter-rater reliability fell below 70% related to the lowest positive score on muteness (verbally unresponsive to the majority of questions) and posturing (maintains posture without reacting for less than 1 minute).

The inter-rater reliability between D.H. and P.C. in Wales was assessed at the end of the study. They independently examined 10 randomly selected psychiatric in-patients. The inter-rater reliability on the CSI and DSM-IV criteria for catatonia was 100%, for the total CRS score within one point it was also 100%, and for the 10 items with a frequency of 15% or more it was 80–100% with a mean of 88%.

Frequency and clinical presentation of catatonia

Table 1 shows the number of consecutive admissions who were screened during the study and the frequency of catatonia in the two

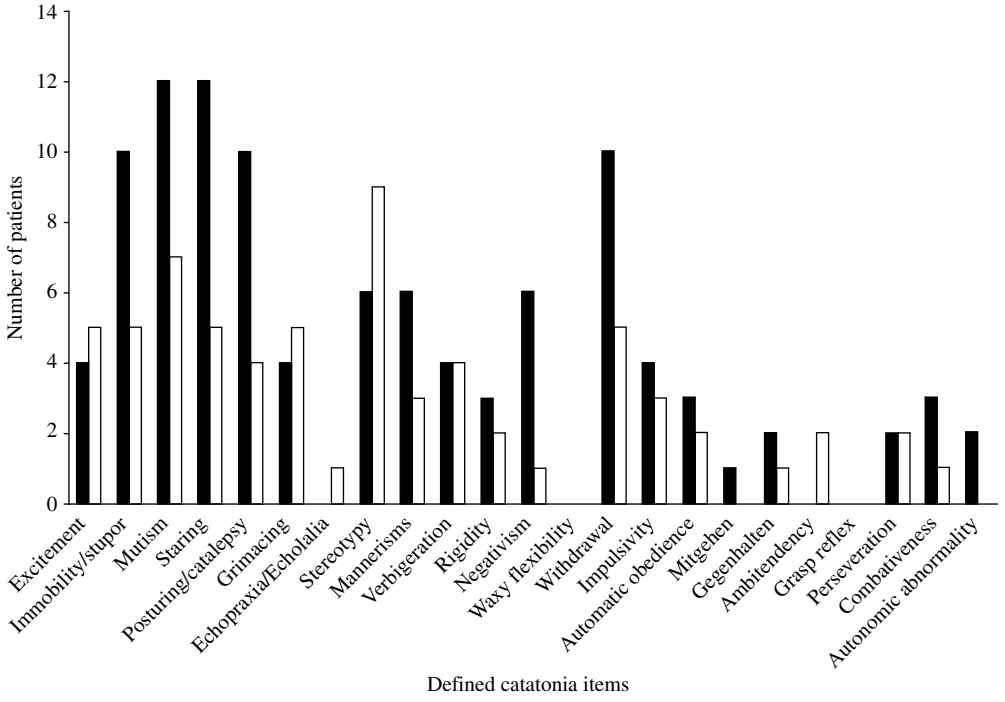

FIG. 1. Frequency of each defined catatonia item on the Catatonia Rating Scale in the two settings. ■, India ($n=16$); □, Wales ($n=14$).

psychiatric units in India and Wales. There were no differences in the proportions of patients excluded from the study, patients who screened positive for catatonia on at least one occasion or the frequency of catatonia using the CSI between the two units. Using DSM-IV criteria for catatonia, there were also no differences in the frequency of catatonia. The number of patients who could not complete the screening in the two units was $<10\%$. There were no differences in the severity of catatonia between India and Wales nor in the proportion meeting CRS criteria for severe catatonia (CRS score of $\geqslant 4$; Bush *et al*. 1996*a*).

Fig. 1 shows that there were no significant differences in the frequency of any catatonic feature between the two psychiatric in-patient units. However, there were twice as many affected individuals with immobility/stupor, staring, posturing/catalepsy and withdrawal in India than Wales; no feature of catatonia was found in twice as many individuals in Wales as India. Table 1 shows that retarded forms of catatonia were twice as common in India than Wales but excited forms were equally common in the two settings (Morrison, 1973).

Relationship of catatonia to demographic features and medication

Catatonia cases in India were younger, had a shorter duration of illness from the time of first psychiatric diagnosis and were more likely to be male than in Wales, age [mean (S.D.) years] [India 25·4 (6·2) *versus* Wales 51·1 (21·9), $t=4{\cdot}9$, $p<0{\cdot}001$]; duration of history [mean (S.D.) years] [India 2·3 (4·2) *versus* Wales 12·7 (10·9), $t=3{\cdot}8$, $p<0{\cdot}001$]; male:female gender [India 10:6 *versus* Wales 3:11, $\chi^2=11{\cdot}1$, df$=1$, $p=0{\cdot}001$]. In each in-patient unit more catatonia cases than catatonia non-cases showed evidence of physical illness but there was no difference in the frequency of physical illness in catatonia cases between India and Wales [India 7 (43·8%) *versus* Wales 8 (57·1%), $\chi^2=1{\cdot}0$, df$=1$, $p=0{\cdot}31$]. In India physical illnesses were infections, a history of tuberculosis, respiratory arrest following ECT, seizures or head injury. In Wales physical illnesses were ischaemic heart disease,

hypertension, Parkinson's disease, CT scan evidence of frontotemporal atrophy, myelodysplastic syndrome and hypothyroidism. Across both settings, catatonia cases were found in a range of ICD-10 F diagnostic categories (WHO, 1992) [organic mental disorders 1 (3·3%); mental and behavioural disorders due to psychoactive substance use 2 (6·7%); schizophrenia, schizotypal and delusional disorders 11 (36·7%); affective disorders 11 (36·7%); neurotic, stress-related and somatoform disorders 1 (3·3%); behavioural syndromes associated with psychological disturbances and physical factors 1 (3·3%); disorders of adult personality and behaviour 3 (10·0%)]. In both cases and non-cases of catatonia, the most common diagnostic category in India was schizophrenia, schizotypal and delusional disorders, while in Wales it was an affective disorder.

There was a non-significant difference between India and Wales in the proportion of catatonia patients who received medication on first screening [India 5 (31·3%) *versus* Wales 12 (85·7%), $\chi^2 = 0{\cdot}93$, df = 1, $p = 0{\cdot}33$]. The differences between the centres in medication were entirely due to prescriptions of antidepressants, lithium and benzodiazepines on admission in Wales. A quarter of all catatonia patients received typical neuroleptic medication at first screening; in India all four patients taking typical neuroleptic medication also took anticholinergic medication compared to one patient in Wales. One patient in Wales only took an atypical neuroleptic at first screening. Medication at first screening in catatonia cases in each unit reflected medication use in non-catatonia cases. In each catatonia case the patient met CSI criteria for catatonia on at least one occasion before further psychotropic medication was started. Only two patients in India had prior exposure to neuroleptic medication compared to all five patients in Wales who were taking neuroleptic drugs on hospital admission.

DISCUSSION

Our results indicate that the frequency of catatonia is common among consecutive psychiatric admissions to in-patient units in both India and Wales if sensitive standardized screening instruments and diagnostic criteria are systematically applied. The frequency of DSM-IV catatonia was 10% of psychiatric in-patient admissions in Wales and 14% in India, which are both in the range of prevalence quoted in other modern surveys of catatonia carried out in mental health services of developed countries (Abrams & Taylor, 1976; Rosebush *et al.* 1990; Pataki *et al.* 1992; Ungvari *et al.* 1994; Bush *et al.* 1996*a*; Lee *et al.* 2000; Fink & Taylor, 2003; Kruger *et al.* 2003). In contrast to the views of some authors, e.g. Johnstone *et al.* (1998), our study shows that cases of catatonia do not in fact differ substantially in the overall severity of catatonia between mental health settings in India and Western countries such as Wales. However, there was a two-fold difference in the frequency of retarded catatonia (Morrison, 1973) in India compared to a Western country (Wales). Two-fold differences between India and Wales were present in immobility/stupor, posturing/catalepsy, staring, and withdrawal; the first three features may be regarded as classical features of catatonia (Rogers, 1992; Bush *et al.* 1996*a*; Taylor & Fink, 2003). We believe that the impression that catatonia is more common in India than developed countries such as Wales (WHO, 1973; Mahendra, 1981; Kleinman, 1988) may stem from the recognition that some of the classical catatonic features such as posturing, catalepsy and stupor are more commonly seen in India as well as possible over-inclusion of all motor signs as features of catatonia (Rogers, 1992). However, the differing clinical presentations between India and Wales may be due to differences in age and age of onset rather than culture or underlying aetiology.

Our study found cases of catatonia across a wide spectrum of ICD-10 diagnoses in consecutive admissions to Indian and Welsh hospital units including harmful substance use, neurotic disorders and personality disorders not just schizophrenia, affective disorder and organic mental disorder. Our data support the view (Lohr & Wisniewski, 1987; Fink, 1996; Taylor & Fink, 2003) that catatonia should be considered a supplementary diagnosis in all mental disorders.

The results are not explained by poor inter-rater reliability on the CSI and CRS in either setting or lack of blindness of assessment by the research psychiatrist. Prior to the study an expert psychiatrist in Wales trained the research

psychiatrist who made the assessments, and there was excellent inter-rater reliability between the two psychiatrists in Wales and the research psychiatrist and two local psychiatrists in India after the study. The inter-rater reliability of caseness on the CSI, total score on the CRS and individual items on the CRS in India in our study was similar to that reported previously in the USA (Bush *et al.* 1996*a*). A second independent rater, who was blind to the ratings in Wales, made the ratings when there was disagreement with the research psychiatrist in cases of catatonia in India so that the results in India could not be attributed to lack of blindness.

The specificity of the CRS to discriminate catatonia from other motor disorders is yet to be established (Bush *et al.* 1996*a*). However, we applied narrower DSM-IV criteria for catatonia (APA, 1995) that do not rely on non-specific items such as excitement, withdrawal and rigidity and still found no overall difference in the frequency of catatonia. Therefore, among cases of catatonia, the lack of specificity of items on the CSI/CRS such as rigidity, withdrawal, excitement, impulsivity, grimacing and combativeness that may have causes other than catatonia, will not have confounded the estimate of the frequency and severity of catatonia.

The relatively low use of typical neuroleptic drugs during initial screening in both India and Wales suggests that the comparable frequency of catatonia cases is unlikely to be explained by the use of neuroleptic medication. However, the presence of extrapyramidal signs, such as rigidity that could be easily be confused with catatonia, are found in people with schizophrenia who have never received neuroleptic medication (Puri *et al.* 1999).

Although the frequency and severity of catatonia was similar in both in-patient units, there were substantial differences in demographic features, physical illnesses and diagnostic categories between cases of catatonia in India and Wales. These differences reflected the age and gender of all patients admitted to these units. Catatonia is often seen in younger people with psychiatric disorders (Thakur *et al.* 2003) but our data show that they appear in older people also (Fink & Taylor, 2003). Our results confirm that co-morbid physical illness of all types may be important to the aetiology and presentation of catatonia (Carroll *et al.* 1994). In both in-patient units, $\sim$50% of catatonia cases had some signs of physical illness, a finding that was at least twice as common in catatonia cases than catatonia non-cases in each setting.

The methodological strengths of the study are: (1) a psychiatrist, who had no role in patient management decisions, screened consecutive admissions to psychiatric units in each unit; (2) adequate sample sizes were recruited to compare the overall frequency of catatonia and compare its severity on the basis of a predetermined power calculation thereby reducing the possibility of type II statistical error; (3) in both units, the clinical examination was performed by a single psychiatrist who spoke both the languages and is familiar with the cultures, minimizing possible cultural bias and inter-rater bias; (4) the screening was performed using a sensitive, standardized rating instrument for catatonia; (5) inter-rater reliability on the CSI and CRS was established between the research psychiatrist and psychiatrists working in both India and Wales; (6) screening of all the patients occurred at a set point after admission (within 48 hours of admission) so that patients were assessed at a similar time point after admission in each unit and before the clinical presentation was substantially changed by treatment initiated by the clinical teams after admission; (7) less than 10% of admissions to each unit were excluded from the study or failed to complete all the screening assessments.

There are some important methodological limitations to the study: (1) the study was designed only to detect large differences in the frequency and severity of catatonia in the two units comparable to the differences in prevalence of catatonia found previously in similar mental health settings; (2) there may have been insufficient statistical power to detect differences in frequency of individual catatonic features among patients with catatonia in the two units; (3) the researcher was not blind to the results in Wales when screening patients in India. However, efforts were made to minimize this problem as described above; (4) the instructions to use the CSI and CRS require the rater to make a subjective judgement that a feature is definitely present, a judgement that may be difficult to apply to mild catatonic features seen in vastly different cultural, linguistic and service settings; (5) we relied on local clinicians'

diagnosis based on their interpretation of ICD-10 classification of psychiatric disorder and did not carry out standardized psychiatric interviews ourselves to check their diagnosis; (6) although the association of physical health with catatonia seems to be strong enough to indicate further investigation, there was no opportunity to investigate in detail the association with specific physical health problems in this study; (7) the units varied so much in age, gender, duration of history and treatment with psychotropic drugs that no inferences can be drawn about aetiology; (8) there was no concurrent standardized assessment of extrapyramidal involuntary movements to check the overlap in diagnosis with catatonia (Rogers, 1992).

Our study confirms that catatonia is common among in-patient units in India and Western countries such as Wales, and so far in every survey where screening instruments and diagnostic criteria for catatonia have been applied (Fink & Taylor, 2003). However, the diagnosis of catatonia may be missed in routine practice since catatonia is considered to be a vanishing feature of psychiatry in developed countries (WHO, 1973; Mahendra, 1981; Kleinman, 1988). The clinical importance of the diagnosis of catatonia has still to be definitively established but it may be a risk factor or an early manifestation of the potentially lethal neuroleptic malignant syndrome or serotonin syndrome (White & Robins, 1991; Taylor & Fink, 2003), and may respond to treatment with benzodiazepine medication or electroconvulsive therapy (Ungvari *et al*. 1994; Bush *et al*. 1996*b*; Schmider *et al*. 1999; Lee *et al*. 2000). However, recent changes in prescribing with the greater use of atypical antipsychotic agents may have reduced the frequency of neuroleptic malignant syndrome and there are few randomized controlled trials of treatments specifically for catatonia. The clinical importance of catatonia, together with an understanding of the aetiology of catatonia, requires further research.

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DECLARATION OF INTEREST

None.

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