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Research Article

Prevalence, phenomenology and etiology of delirium in medically ill patients

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ABSTRACT

Background: Delirium is one of the most common causes of referral of medically ill patients for psychiatric management and is associated with significant morbidity and mortality. The aim of the study was to determine the prevalence and etiology of delirium among medically ill patients and to describe its phenomenology.
Methods: A cross-sectional descriptive study was conducted in the general medical ward of a tertiary care hospital. Four hundred patients were screened for delirium using the confusion assessment method. The delirium rating scale revised-98 was used to further characterize the severity and phenomenology of delirium. Descriptive statistics such as frequencies, means and standard deviation were used. Chi square test was applied to compare categorical variables and Fisher's exact test was used to test associations. Student t test was used to compare the means of independent groups.
Results: The prevalence of delirium was 9.75%. Male gender (69.23%) and age above 60 years (66.67%) were significantly associated with delirium (p values of 0.04 and <0.001 respectively). Mixed delirium was the most common motor subtype (46.15%). The most common cause of delirium was metabolic encephalopathy (43.59%). There was significant association between hyperactive delirium and psychotic symptoms. Delirium went undiagnosed in 61.64% of the cases.
Conclusions: Delirium is a common problem among medically ill patients and runs the risk of being undiagnosed. Clinicians should routinely screen patients at high risk for delirium to decrease the morbidity and mortality associated with this dreaded, yet potentially reversible entity.

Keywords: Delirium, Medically ill, Confusion, Hyperactive

INTRODUCTION

Delirium is characterized by an acute decline in the level of consciousness and cognition with particular impairment in attention. Other associated features include abnormal psychomotor activity, sleep cycle impairment and psychiatric symptoms such as abnormalities of mood, perception and behaviour.[1] It develops over a short period of time and fluctuates during the course of the day. It is a common neuro cognitive disorder which heralds an increase in morbidity and mortality.[2] It is also known by other terms such as acute confusional state, toxic psychosis and metabolic encephalopathy.[1] Delirium is usually rapid in onset with a diurnally fluctuating course and duration of less than six months. Based on the etiology, DSM 5 classifies delirium as substance intoxication delirium, substance withdrawal delirium, medication- induced delirium, delirium due to another medical condition and delirium due to multiple etiologies.[2] It is also further specified as hyperactive delirium, hypoactive delirium and mixed delirium based on the level of psychomotor activity.[2,3] The cause of

delirium in most patients is found to be multifactorial with a number of predisposing and precipitating risk factors.[4,5]

Delirium is found to be the most common diagnosis in patients referred to psychiatric services from different wards.[6] Prevalence of delirium among medical in - patients is found to range from 10 to 30% and the incidence of new delirium from 3 to 29%.[7] It is particularly common in elderly patients in whom it is likely to be missed.[8,9] This has been attributed to lack of routine screening for delirium and lack of sensitive and screening instruments for the same.[10] Thus delirium is a commonly encountered entity in medical and surgical wards which presents a challenge to the treating physician. The present study was undertaken keeping in mind the lack of systematized work on the phenomenology of delirium. The aim was to determine the prevalence and etiological factors of delirium in medically ill patients and to describe the phenomenology of delirium.

METHODS

Study design, setting, sample

Our study was a cross-sectional descriptive study which was carried out in Pondicherry institute of medical sciences, a tertiary care hospital in South India. The study was approved by the institute ethics committee. The study sample included 400 patients admitted in the medical ward who were selected by systematic random sampling. Written informed consent was obtained from the patient or from the relative for patients who lacked competence to give consent. Socio demographic details of the patients were collected using a pro forma.

Study instruments

Every patient was screened for delirium using the confusion assessment method (CAM). The CAM consists of operationalized criteria from the diagnostic and statistical manual of mental disorders. For the diagnosis of delirium, it requires the presence of both acute onset with fluctuating course and inattention and either of disorganized thinking or altered level of consciousness.[11,12] If the patients were found to be delirious by the CAM, they were further administered the delirium rating scale- revised (DRS- R-98) to investigate the phenomenology of delirium.[13-15] The DRS-R-98 is a severity scale which has 13 items rated from zero to three points. The scale also has three optional diagnostic items rated from zero to two or three points for differentiating delirium from other disorders. The sum of both gives the total score. The liptzin and levkoff criteria were used to determine the motor subtype of delirium.[16] Information about patients' alcohol use was obtained using the DSM IV TR criteria for alcohol abuse and dependence.[17]

Statistical analysis

Data distribution was analyzed using descriptive statistics such as frequencies, means and standard deviation. SSPS version 17.0 was used for analysis. Chi square test was applied to compare categorical variables and fisher's exact test was used to test associations for groups with small sample size. Student t test was used to compare the means of independent groups.

RESULTS

Prevalence of delirium

Of the 400 medically ill patients who were screened, 39 were found to be delirious as per the Confusion Assessment Method yielding a prevalence of 9.75%.

Gender and delirium

Out of the 400 patients, 216 were male (54%) and 184 patients were female (46%). Among the delirious patients, 27 were male (69.23%) and only 12 were female (30.77%). Therefore delirium was more common in males and this gender difference was found to be statistically significant (p value =0.04531) (Table1).

Age and delirium

The distribution of age in the general medical population revealed a bell shaped curve. The youngest patient in the medical ward was 15 years old and the oldest 90. The average age of all the medically ill patients was 48.5 years, and the average age of delirious patients was 62 years with a standard deviation of 14.22 years (Figure1). Patients above 60 years of age constituted 66.67% of the delirious group. There was significant association between age above 60 years and delirium (p value <0.001, actual p value=0.00000000) (Table1).

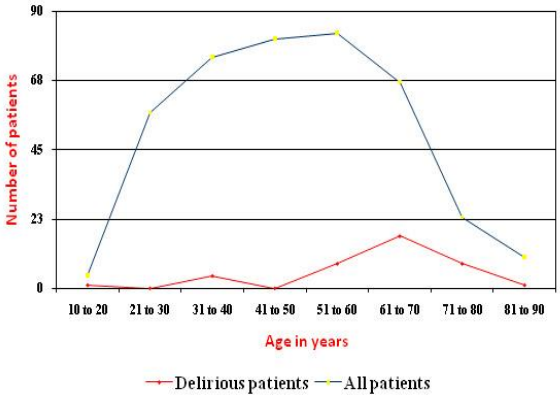

Figure 1: Line diagram comparing age distribution of all medically ill patients versus medically ill delirious patients.

Table 1: Demographic correlates of delirium.

Variable		Delirium		Significance
		Present	Absent	
Gender	Male	27 (6.75%)	189 (47.25%)	p<0.04*
	Female	12 (3%)	172 (43%)	
Age (years)	< 40	5 (1.25%)	131 (32.75%)	p<0.001†
	41-60	8 (2%)	156 (39%)	
	> 60	26 (6.5%)	74 18.5%	

*Statistically significant; †highly statistically significant.

Etiology of delirium

Metabolic causes

The most common etiological factor of delirium was metabolic encephalopathy which was found in 17 patients (43.59%). Of the metabolic causes, hyponatremia was the most common cause found in 14 patients (82.35%), followed by renal failure in seven (41.18%). Hypokalemia and hepatic encephalopathy each accounted for delirium in three patients (17.65%) (Table 2).

Table 2: Etiology of delirium.

Etiology of delirium	Number of patients
Metabolic	17 (43.59%)
Infection	15 (38.46%)
Substance withdrawal	11 28.21%)
Cerebro vascular accidents	9 (23.08%)
Epilepsy	4 (10.26%)
Malignancy	3 (7.69%)
Substance intoxication	2 (5.13%)
Dementia	2 (5.13%)
Blood loss	2 (5.13%)
Autoimmune	1 (2.56%)

Infective etiologies

Infection was the next most common etiology, seen in 15 patients (38.46%). Among these patients, five (33.33%) had a lower respiratory tract infection and three (20%) had developed septic encephalopathy secondary to an infective focus. Viral encephalitis was seen in two patients (13.33%) and so was urinary tract infection in the background of chronic renal failure. Tubercular meningitis, dengue and cerebral malaria were found in one patient each (6.67%).

Substance use and delirium

Substance withdrawal was next, with alcohol dependence found in 11 out of the 39 delirious patients (28.21%). Among them, five had developed delirium solely due to alcohol withdrawal and six had multiple causes in addition to alcohol withdrawal. All the five patients had hyperactive delirium and auditory hallucinations and two patients had visual hallucinations also. Seven out of the 39 delirious patients (17.95%) fulfilled DSM IV TR criteria for alcohol abuse. Thus alcohol abuse and dependence together were found in 18 of the delirious patients (46.15%).

Central nervous system causes and others

Cerebrovascular accidents were seen in nine patients (23.08%), epilepsy in four (10.26%), malignancy in three (7.69%), substance intoxication (benzodiazepine), advanced dementia and blood loss in two patients each (5.13%). An autoimmune disorder was seen in one patient (2.56%), who had myasthenia gravis and developed hypoxic encephalopathy due to paralysis of respiratory muscles.

Delirium and number of etiological factors

The majority of patients had developed delirium due to multiple causes i.e. 26 patients (66.67%) while only six patients (15.38%) developed delirium due to a single cause. Five patients (12.82%) had developed delirium solely as a consequence of substance withdrawal, the substance being alcohol. Benzodiazepine intoxication had resulted in delirium in two patients (5.13%) and both patients had ingested it in an attempt to commit suicide. A single etiology, including substance withdrawal or intoxication was implicated in 13 patients (33.33%). Fifteen patients (38.46%) developed delirium due to two causes and 11 (28.2%) patients had three etiological factors. On an average 1.73 factors were found to be implicated in the etiology of delirium.

Subtype of delirium based on psychomotor activity

Mixed delirium was the most common subtype seen in 18 patients (46.15%). There was almost equal representation of hyperactive (10 patients) and hypoactive (11 patients) subtypes constituting 25.64% and 28.21% respectively.

Psychotic symptoms and subtypes of delirium

Perceptual disturbances and delirium

Psychotic symptoms were notably higher in the hyperactive group with an average severity score on perceptual disturbances of 2.5 (SD=0.53).The hypoactive group had a lower severity score of 1.36 (SD=0.70) on perceptual disturbances. This difference was highly statistically significant (p value = 0.0001721). The mixed group had a perceptual disturbances score which was in between the hyperactive and hypoactive groups (1.61 with SD=0.61) (Table 3).

Delusions and delirium

A similar finding was present in the average severity score on delusion with 2.1 (SD=0.32) in the hyperactive group, 0.91 (SD=0.86) in the hypoactive group and 1.44

(SD=0.62) in the mixed group. This difference was also found to be statistically significant (p value= 0.002).

Table 3: Psychotic symptoms and subtypes of delirium.

	Perceptual disturbances (Mean score)	Delusions (Mean score)
Hyperactive delirium	2.5	2.1
Hypoactive delirium	1.36	0.91
	p=0.0001721†	p=0.002*

*statistically significant; † highly statistically significant.

Other items on the delirium rating scale

The other parameters in the DRS-R-98 which had a mean score of two and above was short term memory (2.21), disturbance in the sleep wake cycle (2.05), attention (2) and orientation (2). The mean severity score for delirium was 22.79 (S.D = 3.67, range = 15 to 31) and the mean total score was 28.05 (S.D = 3.96, range = 21 to 37). It is noteworthy that the mean score of disorientation was two, with four patients having a score of only one and one patient with a score of zero. Items with mean scores of less than two were thought disturbances (1.77), visuo-spatial disturbances (1.74), language disturbances (1.69), lability of affect (1.51), and long term memory (1.51).

Detection of delirium by the treating physician

Clinical notes of the 39 delirious patients were reviewed to see whether the delirium was diagnosed by the medical team managing the underlying medical illness. Only 15 of the 39 delirious patients (38.46%) were noted to have delirium. Of these, eight patients (53.33%) had a mixed picture and seven patients (46.67%) had hyperactive delirium. None of the 11 hypoactive patients were diagnosed to have delirium.

Disorientation alone was noted in the clinical progress notes of 14 delirious patients (35.90%).

DISCUSSION

In our study the prevalence of delirium in medically ill patients was found to be 9.75%. This was found to be similar to a systematic review which found a prevalence of delirium ranging from 10 to 31% among medically ill patients at admission.[7] A higher prevalence of 70 to 87% has been reported in patients in intensive care units.[1] Since our study was done among medical ill patients in the ward, it yielded a prevalence of 9.75% consistent with other studies done on similar samples.

Delirium was also found to be more common in male patients. Male sex is a well-established predisposing factor for delirium.[18,19] Therefore it is important to concentrate on predisposing factors of delirium also instead of focusing only on precipitating factors. Such an approach will help in reducing the morbidity and mortality associated with delirium.[1]

Our study found a significant association between age above 60 years and delirium. This is understandable because the incidence of delirium is claimed to be four times higher in later life than that in younger adults. This has been attributed to medical co morbidities and pre-existing neurological conditions including mild cognitive impairment and dementia in the elderly.[20] The problem of delirium in the elderly is further complicated by the fact that it often goes unrecognized particularly in the setting of an already established dementia.[8,9,21] This is mainly due to lack of routine screening for delirium and lack of specific and sensitive instruments for the same.

Although a number of treatments have been described to manage delirium, the treatment of the causative factor is paramount. A number of predisposing and precipitating factors have been implicated in the causation of delirium. Common causes of delirium are central nervous system disorders such as seizure, head trauma and stroke, metabolic disorders such as electrolyte abnormalities, systemic illnesses predominantly infections, chronic obstructive pulmonary disease, renal failure and drugs of abuse.[1] The most common cause found in our study was metabolic encephalopathy, followed by infection, alcohol withdrawal and stroke. Thus the delirious patients in our study were also found to have the well-established causal factors. Alcohol was the only substance of abuse since the prevalence of alcohol dependence in our region of Pondicherry in South India has been found to be 34.5 per 1000 population.[22] Hence physicians should routinely screen all patients for substance use disorders.

Our study found that on an average 1.73 factors were implicated in the etiology of delirium. Delirium due to multiple etiologies is a well-known entity as reflected in the classification of delirium in DSM 5 which includes delirium due to multiple etiologies.[2] Therefore a diagnosis of delirium should lead to the search of more than one etiological factor in the same patient because in most cases it is multifactorial.[4]

Mixed delirium was the most common motor subtype in our study. Other studies have also found mixed subtype as the most common.[23,24] It has been suggested that the subtypes differ in the underlying pathology, response to therapeutic intervention and outcome, with hypoactive delirium having a notably poorer prognosis although some studies have not found such an association.[25,26] Hypoactive delirium is likely to go undiagnosed thereby resulting in poorer prognosis. Hyperactive delirium is preferentially referred for management by psychiatrist because of disturbed behavior, disorientation, irrelevant talk and decreased sleep.[27] The patients with hyperactive delirium in our study had more perceptual abnormalities and this would have contributed to the motor agitation, hyper vigilance, anger and irritability resulting in their categorization under the hyperactive group. The

delusions would have also contributed to the patients' inclusion in hyperactive group through a mechanism similar to that of the perceptual disturbances.

It is important to note that the mean score of patients on disorientation item was two, with four patients having a score of only one and one patient with a score of zero. This is important because of the prevalent informal practice among physicians of checking the patients' orientation alone while assessing for delirium, since delirium can be present in a normally oriented patient also.

Another important finding in our study was that, of the 39 delirious patients, only 15 (38.46%) were noted to have delirium. Delirium often goes unrecognized in the clinical setting.[1] The finding of under-diagnosis of delirium in our study is of enormous significance since delirium is a serious, yet potentially reversible disorder associated with high morbidity and mortality and the longer the patient is delirious, the worse is the prognosis.[1,28] Disorientation alone was noted in the clinical progress notes of 14 delirious patients (35.90%). This finding reflects the common practice of checking only for orientation while assessing patients for delirium.

CONCLUSION

Our study highlights the importance of screening for delirium among all medically ill patients especially in the presence of already established predisposing and precipitating factors. Undue emphasis should not be placed on disorientation alone while assessing a patient for delirium. The strength of our study was the screening of patients of all age groups of the general medical ward as most of the published work has been done only in intensive care units and among the geriatric age group. However, our cross sectional assessment of patients to diagnose delirium was a limitation since delirium fluctuates during the day. This was partly overcome by timing all our assessments in the evening when delirium is known to worsen. Future work should include follow up of delirious patients to determine the correlation between the subtypes of delirium and its course and outcome.

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