PREVALENCE OF DELIRIUM IN GERIATRIC HOSPITALIZED GENERAL MEDICAL POPULATION

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ABSTRACT

The present study was carried out on the hospitalised geriatric general medical patients. The assessment of the patients was carried out within 24 hours of admission and on every fourth day thereafter using Mini Mental Status Examination (MMSE), Confusion Assessment Method (CAM), Delirium Symptom Interview (DSI) and ICD-10-Diagnostic Criteria of Research for delirium. An overall rate of delirium of 27% was found in the 100 patients who constituted the sample. 19% was the rate of 'prevalent' delirium and 8% was the rate of 'incident' delirium. It is observed that the CAM is a useful screening method with high sensitivity for diagnosis of delirium at the bedside.

Key words: Delirium, elderly, geriatric, epidemiology

Delirium is a syndrome of disturbed consciousness, attention, and cognition or perception, which develops acutely, fluctuates during the course of the day, and is attributable to a physical disorder (DSM-IV, American Psychiatric Association, 1994). This syndrome is the focus of increased attention because of its enormous impact on human suffering as well as on patient care costs. In the elderly, delirium is common, particularly in the hospitalised patients (Inouye, 1994). It has a high rate of associated morbidity and mortality (Francis & Kapoor, 1992; Jitapunkul et al., 1992, Rabins & Fostein, 1982). The elderly are particularly prone to develop delirium even in the course of a mild physical illness or as a side effect of drugs. Its incidence in the later life has been claimed to be four times higher than that in younger adults and to be highest among patients older than 70 years. (Inouye, 1994; Francis, 1992; Jitapunkul, et al.,

1992; Rabins & Folstein, 1982).

However, delirium in the elderly remains relatively neglected. This is because it is not often considered to be particularly important; as it is transient, usually "quite", and powerful sedatives are available to control any disturbed behaviour that might occur. In fact, the transience and quietness of delirium in the elderly mean that it is often missed, or dismissed as dementia and important opportunities for early identification and correction of the underlying causes are lost. In studies conducted in the last few years, 32% to 67% of delirious patients went unrecognised by the primary care clinicians (Williams, et al., 1985; Gustafson et al., 1988; Francis, et al., 1990; Levkoff et al., 1992 & Inouye et al, 1993) During medical evaluation, cognitive function is rarely formally assessed (Cavanaugh, 1983 ; McCartney & Palmateer, 1985) and particularly in the hospital setting there is often minimal knowledge about

the patient's prior cognitive status or the course of any cognitive changes. Finally, the lack of easily applied diagnostic criteria for delirium has undoubtedly contributed to difficulty in the recognition of the problem. The crucial first step towards recognition of delirium is suspecting the diagnosis.

The most commonly used instruments to study delirium in the elderly have been the Mini Mental Status Examination (Folstein et al., 1975), Confusion Assessment Method (Inouye et al., 1990), Delirium Rating Scale (Trzepacz, et al., 1988) and Delirium Symptom Interview (Albert, et al.,1992). All these instruments have been designed and standardized using western populations and are in the English language. However in the absence of more suitable alternatives, these instruments continue to be used in the Indian setting also. No epidemiological study focusing on delirium in the elderly has been reported from India so far, either from population based or hospital based sample. Therefore the present study was aimed to determine the prevalence of delirium in hospitalised geriatric general medical inpatients and to determine sensitivity and specificity of Mini Mental Status Examination (MMSE), Confusion Assessment Method (CAM) and Delirium Symptom interview (DSI) to diagnose delirium in Indian set up.

MATERIAL AND METHOD

The present study was carried out on patients who were admitted under the Department of Internal Medicine, Kasturba Hospital, Manipal, Karnataka. This institution provides advanced medical care and referral services to the inhabitants of Western Karnataka, Goa, Northern Kerala and other adjacent areas.

100 consecutive patients, aged 65 years and above and who were admitted in Department of Internal Medicine were included in the study. A list for all such admitted patients was obtained from the admission counter of Kasturba Hospital every day and the investigator examined the patients in their wards within 24 hours of admission. After introducing himself to the patients and their relatives, the investigator explained the nature and need for the present study. Co-operation was sought for participation in the study from the patients or their relatives. They were assured that their declining to participate would not prejudice treatment.

Patients who were not communicative because of their physical status, viz. being on ventilator, being intubated, were not included in the study. However, if such a patient became communicative on subsequent assessment, he or she was included in the study.

The Mini Mental Status Examination (MMSE), Confusion Assessment Method (CAM) and Delirium Symptom Interview (DSI) were used as screening methods to assess the patients cognitive functions.

MMSE is a general-purpose cognitive screening test consisting of 11 items and requiring 5-10 minutes to administer. This is the most commonly used screening method for delirium and dementia. Functions tested include orientation, registration (repetition), attention and calculation (serial events), recall, language (object naming, repetition, comprehension, reading and writing, a three-step item, and a graphic copy of a geometric design. The maximum score is 30 points. The authors suggest that patient scoring below 24 is cognitively impaired. Folstein et al.(1975) did not report validity data for delirium separate from dementia. Studies have shown that patient with clinically diagnosed delirium or dementia will have MMSE scores <24 at least 75% of the time (Folstein, 1975; Anthony,1982; Dick, 1984). CAM is a screening instrument based on DSM-III-R (American Psychiatric Association, 1987). The CAM algorithm for a diagnosis of delirium requires the presence of acute onset and fluctuating course, inattention, disorganized thinking or altered level of consciousness. This is a previously validated instrument with a sensitivity rate ranging from 94-100% and a specificity rate ranging from 90-95%.

DSI is a structured interview that assesses seven symptom domains of delirium as specified in DSM-III-R (American Psychiatric Association, 1987) including disorientation, disturbance of

consciousness, disruption of sleep/wake cycle, perceptual disturbance, incoherence of speech, change in psychomotor activity and fluctuating behaviour. Interview has 90% sensitivity and 80% specificity, when compared with clinical judgment of a psychiatrist and neurologist. Albert et al. (1992) defined a patient as "positive" on DSI if he or she had any of the critical symptoms of delirium: disorientation, disturbance of consciousness, or perceptual disturbance. Patients were not considered positive if they were related as having only disturbance of sleep wake cycle, incoherent speech, or inappropriate level of psychomotor activity, because these symptoms were felt to be less central to the diagnosis of delirium.

The clinical diagnosis of delirium was reached using the ICD-10 Classification of Mental and Behavioural Disorders- Diagnostic Criteria for Research (ICD-10-DCR, World Health Organization, 1993) on the basis of information gathered both through history and examination. All the patients recruited in the study were followed up in the hospital till they were discharged or died.

RESULTS

Of the 100 patients included in the study 64% were men and 36% were women. The ages of these patients ranged between 65 to 89 years. There were 55% patients who had studied less than eighth standard, of whom 36% (20 patients) had not received any formal education. 45% patients had studied over eighth standard spread over secondary education, graduation and post-graduation.

Out of 100 patients there were 27 patients who were delirious at some point during their hospital stay. Of these 27 patients, 19 (70.4%) were delirious at the time of first assessment (within 24 hours of admission) i.e. prevalent cases. A further 8 (29.6%) patients developed delirium during their hospital stay (after the first assessment) i.e. incident cases. The term "delirium" is used hereafter for patients who fulfilled ICD-10 DCR criteria of delirium.

27 patients were found to be delirious according to CAM criteria. The same 27 patients also fulfilled the criteria for delirium according to ICD-10-DCR. No other cases were diagnosed as delirious by either CAM or ICD-10-DCR. This gives a 100% sensitivity of the CAM diagnosis of delirium against ICD-10-DCR diagnosis of delirium.

34 patients were "positive" on DSI. All 27 delirious (ICD-10-DCR) patients were positive on DSI. Rest seven DSI positive patients were not delirious. This gives 100% sensitivity and 90% specificity to DSI as against ICD-10-DCR diagnosis of delirium. Mini Mental Status Examination scores of the non-delirious patients were compared with those of patients who ever became delirious. At the assessment when they first obtained a diagnosis of delirium all 27 delirious patients scored less than 24, which is the cut off for significant cognitive deficit (Folstein et al., 1975), while out of 73 non-delirious patients 40(54.8%) also scored less than 24. This gives specificity

TABLE
DELIRIOUS AND NON-DELIRIOUS PATIENTS ON DIFFERENT INSTRUMENTS

Group	Non-delirious (ICD-10-DCR) (n=73)	Delirious (ICD-10-DCR) (n=73)
CAM Non-delirious	73	0
CAM Delirious	0	27
DSI Negative	66	0
DSI Positive	7	27
MMSE Score>24	33	0
MMSE Score<24	40	27

of 45.2% to MMSE to diagnose delirium. Statistical test showed significant difference in MMSE score of delirious and non-delirious patients (p=0.00006), the delirious group having a higher proportion of below 24 scores than the non-delirious group.

DISCUSSION

Delirium is often unrecognised in the clinical setting. 32-67% of delirious patients are unrecognised by the physician (Levkoff et al.,

1986; Gaustafson et al., 1988).

Studies on delirium often suffers on account of not using specified criteria for diagnosis (Erkinjuntti et al., 1986; Francis et al., 1990; Johnson et al., 1990; Rockwood, 1989). DSM-III and DSM-III-R offered criteria for the diagnosis of delirium. There are however significant differences between these criteria and the present day DSM-IV (American Psychiatric Association, 1994) and ICD-10 (World Health Organisation, 1992) criteria. A major shift has been in the inclusion of impaired consciousness as primary criteria. This was present in DSM-III but removed in DSM-III-R and to be reintroduced in DSM-IV and ICD-10. Unlike the DSM-IV and ICD-10, the ICD-10-DCR gives special emphasis under disturbances of cognition for the presence of impaired recall, recent memory and disorientation. This shift in diagnostic criteria makes the ICD-10-DCR criteria the most specific and stringent.

Therefore it was decided to use ICD-10-DCR criteria for the diagnosis of delirium in this study.

27% patients in this study were delirious at some point during their hospital stay as per ICD-10-DCR. This is in keeping with the range 15% to 25% in prevalence reports of different studies (Inouye et al., 1990; Erkinjuntii et al., 1986, Rockwood, 1989; Jitapunkul, 1992; Report of the Royal College of Physicians, 1981).

Interestingly all the 27 patients who received ICD-10-DCR diagnosis of delirium had also received the CAM diagnosis of delirium. No other patients were diagnosed delirious by either of these two methods giving a sensitivity of 100%. This is in keeping with the sensitivity rate of 94% to 100% given by Inouye et al. (1990). Inouye (1994) reported specificity of 90-95% against DSM-III-R to diagnose delirium. But our study found 100% specificity of this instrument to diagnose delirium as per ICD-10-DCR. This suggests the usefulness of this method for a screening diagnosis of delirium. The difference in specificity rates could be due to the difference in criteria to diagnose delirium in ICD-10-DCR and DSM-III-R.

All the 27 delirious patients (ICD-10-DCR)

were also positive on DSI. Seven nondelirious patients were also positive on DSI. This gives 100% sensitivity and 90% specificity to DSI as against ICD-10-DCR diagnosis of delirium. Albert et al. (1992) compared diagnosis of delirium obtained from this interview with clinical judgment of psychiatrist and neurologist and reported 90% sensitivity and 80% specificity.

In the case of MMSE scores, while all the delirious patients scored less than 24 at the time of being delirious, 40 of 73 non delirious patients also scored less than 24. Although the difference between the delirious and non-delirious groups is statistically significant, two factors need to be kept in mind while assessing these results. Firstly there are limitations to the use of MMSE in the less educated, secondly the relatively large number of low scoring MMSE protocols in the non-delirious may suggest a pre-existing cognitive impairment in them. In the absence of similar data in the delirious group prior to the onset of delirium, valid conclusions cannot be drawn. This is important in the light of Morse and Litin (1969) observation that one third of the delirious have pre-existing dementia. The present findings underline the limitation in the use of MMSE in diagnosing syndromes such as delirium.

Eight (29.6%) of the 27 delirious patients developed delirium after admission, which constitutes eight percent of the total study group which was screened for delirium. This is in slight variance to the reports on elderly patients by Levkoff et al. (1986 and 1992), which reported 15% to 20% patients developing delirium during their hospital stay. It is possible however that the higher mean ages of the sample population in other studies, contributed to their higher rates of incident delirium. However the study by Francis et al. (1990) has quoted a range of 3% to 12% incidence of delirium in the hospitalised elderly.

Although the findings of this study are in keeping with the existing literature, for the age group of the current sample the prevalence figure of delirium could be higher had the population included more patients from the above 75 year age. Other special populations (surgical, gynaecological, orthopaedic etc.) need to be

similarly investigated. Culture free and standardized instruments suitable for our population would help the investigations in this area. It is observed that the CAM is a useful screening method with high sensitivity for diagnosis of delirium at the bedside.

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