

RESEARCH ARTICLE I

Prevalence of delirium, depression and dementia among elderly medical inpatients of a tertiary care hospital of Sri Lanka

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Abstract

Background: Delirium, depression and dementia are highly prevalent neuropsychiatric conditions among older adults, and have a huge impact on quality of life, morbidity and mortality.

Objectives: This study aimed at determining the prevalence of delirium, depression, and dementia among elderly medical in-patients admitted to the National Hospital of Sri Lanka. The other objectives were to describe the associations of delirium, depression, and dementia, and to determine the rate of identification by the treating team.

Materials and methods: A cross-sectional descriptive study was conducted among 234 elderly patients admitted to the National Hospital of Sri Lanka. The participants were screened using Sinhala and Tamil versions of Confusion Assessment Method (CAM), Geriatric Depression Scale (GDS) and Montreal Cognitive Assessment (MoCA), and those who screened positive were subsequently assessed with Diagnostic and Statistical Manual (DSM) 5 criteria.

Results: Sixty five percent were females, and the mean age was 69.47 (SD + 7.087). Forty two participants, (17.9%, 95% CI 13.3-22.5) screened positive and fulfilled DSM criteria for delirium. Fifty One (25.5%) screened positive with GDS and forty-seven (23.5%, 95% CI 17.8-30) were depressed according to DSM5. MoCA scores were positive for cognitive impairment in 130 (72.63%) and the prevalence of dementia was 14.53% (95% CI 9.7-20.6). A statistically significant association was seen for delirium with age and medical comorbidity, for dementia with age, and for depression with marital state and living circumstances. Only 17 (16.19%) out of a total of 105 cases were identified by the treating team, and 1.9 % were referred to psychiatric services.

Conclusions: A significant proportion of older medical in-patients have delirium, depression and dementia, and only a small proportion is identified. It is prudent that medical staff are adequately trained to identify these conditions and liaison psychiatry services are available.

Keywords: delirium, depression, dementia, elderly

Introduction

The elderly population is growing worldwide. According to the UN, the share of the aged persons was 12.5% in 2015, and it is projected to reach 21.1% by the year 2050 [1]. Sri Lanka has a rapidly aging population. In 2012, the proportion of elderly was 12.4% and it is expected to double by reaching 24.8 % by 2041, when one in four Sri Lankans will be elderly [1].

Old age is marked by a series of sinister changes occurring in one's brain, body and life. Hence it is a period where a person is vulnerable to psychological stress and psychiatric illness. While the prevalence of many psychiatric illnesses such as anxiety disorders decreases with aging, neuropsychiatric syndromes such as dementia increase significantly [2]. The impact of psychiatric illnesses on quality of life, functionality, morbidity and mortality in elderly is huge.

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The “Old age mental disorders in Newcastle-upon-Tyne: 1” study revealed a total prevalence of 26% for psychiatric illnesses among older people [4]. Subsequent multicenter studies have shown similar results, with anxiety disorders, affective disorders and substance-related disorders being the commonest [4].

Commonly known as the 3Ds in geriatric psychiatry, depression, dementia and delirium are the most challenging psychiatric/neuro-psychiatric problems in the older age group, and have the biggest impact on the quality of life of patients [5]. These are particularly common in elderly medical patients [6], and come with a 43% excess mortality [7], need for more assistance during ward stay and longer period of hospitalization [8] and admission to long-stay care [7,9].

Depression is the commonest psychiatric illness seen among medical in-patients [10], and carries a significant morbidity and predicts a very poor prognosis [11]. It is associated with increased suicidal risk, mortality, morbidity due to physical disability and poor quality of life in the elderly [12]. Many patients have sub-syndromic depressive symptoms not meeting criteria for a depressive disorder, yet continue to have the same morbidity [11]. Older people with depression tend to present with agitation, somatic symptoms, and memory impairment [12], and are likely to present to medical care rather than psychiatric care.

The prevalence of depression among older people living in the community has been around 13.5 percent [13]. In Sri Lanka, 13.9-27.8 percent had depressive symptoms [15], and the rate can be up to 56 percent in care homes [16].

Dementia imposes a huge burden on health care and functional loss in old age. The global prevalence of dementia in people over 60 years of age varies between 5-7% and it is expected to double every twenty years [17]. By the year 2050, 70% of dementia patients will be living in low- and middle-income countries.

Delirium is frequently seen in elderly people with physical illnesses, especially among hospitalized patients. Between 15-20% patients had delirium at the time of admission to a medical unit and a further 5-10% developed delirium subsequently [18]. The strongest risk factor for delirium is dementia, which can increase the risk of delirium fivefold [18]. In elderly patients with and without dementia, delirium predicted a poor cognitive and functional outcome subsequently [9]. Early recognition and prompt management of delirium is important to reduce mortality, length of hospital stay and subsequent development of dementia.

A large proportion of older patients who are having depression, dementia and delirium may go undetected by the treating physicians and end up having no treatment [10,19].

Data with regard to psychiatric morbidity among medical elderly inpatients is sparse in Sri Lanka. Unfortunately, the 2007 National Mental Health Survey carried out by the

Institute of Research and Development excluded people above 65 years of age. A preliminary study done among 100 elderly patients [20] in a Sri Lankan medical inpatient setting showed that more than 60% had depressive symptoms and more than 50% had cognitive impairment, and none of these patients have been identified and referred. The authors highlighted the importance of psychiatric input in medical settings and the need for coordination between the two disciplines.

The objectives of this study were to determine the prevalence of delirium, depression, and dementia among elderly medical in-patients of the National Hospital of Sri Lanka, to describe the associations certain possible risk factors with these conditions, and to determine the rate of identification and referral of these conditions by the treating team.

Methods

A cross-sectional descriptive study was carried out among patients older than 60 years of age, admitted to the general medical wards of the National Hospital of Sri Lanka. Patients who refused to consent and those who were unconscious were excluded. A convenient sampling method was used, and the eligible patients were assessed within 72 hours of admission to the hospital. When the participants were too ill or unstable to be interviewed, their clinical records were examined, and they were re-assessed after 24-48 hours. A close family member was also interviewed, when necessary, with the consent of the participants.

Ethical approval was obtained from the Ethics Committee of the National Hospital of Sri Lanka and informed written consent was taken from all the participants where possible. The guidelines of the British Psychological Association on “Conducting research with people not having the capacity to consent to their participation (2008)” and the Mental Capacity Act of the England and Wales were adhered to.

All the participants were first screened for delirium with the Confusion Assessment Method (CAM) and those who screened negative were screened for depression with the Sinhala and Tamil versions of the 15 itemed Geriatric Depression Scale (GDS), and for dementia with the Sinhala and Tamil versions of Montreal Cognitive Assessment (MoCA). Those who screened positive for delirium were re-assessed within a period of one week and if they had recovered from delirium, were assessed for depression and dementia. Participants who remained delirious were to be re-assessed after a period of one month.

Those who screened positive for any of the above underwent a complete clinical psychiatric assessment to arrive at the final diagnosis according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM 5).

Data was analyzed using the IBM SPSS Statistics Version 22.

Results

A total of 234 participants were recruited in the study. The mean age of the sample was 69.47 (SD + 7.087), and age ranged from 60 to 93 years. The majority of the sample (56.4%, $n=132$) were in the 60-69 age category. 77 (32.9%) were aged 70-79 years, and 24 (10.3%) were aged 80-89 years, while only one participant (0.4%) was aged 90 years or above. Sixty five percent (152) were females and the female to male ratio was 1.8:1. The majority (53.4 %) of the sample were married at the time of the study, while 35% were widowed, 18% single and 5% were divorced.

Fifty percent (50.0%) of the participants have had secondary education; from grade 6 to ordinary level. 16 participants (7.3%) had no formal education, while 17 (7.3%) have had university education of equivalent.

The majority of the participants (190, 81.2%) lived with their immediate family; spouse, children or both spouse and children. Only 85 (16.2%) of the sample were employed at the time of the study.

All participants were first seen within 48 hours of admission, where most (122, 52.4%) have been seen within the first day since admission according to calendar dates. The majority of admissions were due to dyspnoea ($n=38$, 16.2%), fever ($n=37$, 15.8%) and chest pain ($n=37$, 15.8%). The most common diagnoses among the participants were Acute Coronary Syndrome ($n=39$, 16.7%), urinary tract infection ($n=23$, 9.8%), and lower respiratory tract infection ($n=17$, 7.3%).

Only 10 (4.3%) participants had a previous diagnosis of a psychiatric illness, and out of them, 5 had a past history of depression. Among the participants with a past history of mental illness, only 5 (50%) were on psychotropic medications (three on antipsychotics, one on antidepressants, and one on mood stabilizers). The

commonest chronic medical co-morbidities present in the sample were hypertension ($n=145$, 62%) and diabetes mellitus ($n=136$, 58.1%). Twenty participants (8.5%) did not have any co-morbid chronic physical illness. Sixty one (26.1%) had three co-morbidities while 56 (23.9%) had two medical conditions.

Prevalence of delirium, depression and dementia

All the participants ($n=234$) underwent screening for delirium with CAM, and $n=42$ (17.9%) screened positive and also fulfilled the DSM V criteria delirium. The prevalence of delirium in this sample was therefore 17.9% (95% Confidence Interval 13.3-22.5).

200 participants underwent screening for depression with GDS. The mean GDS score was 4.28 (SD + 4.19). 51 (25.5%) screened positive with GDS at a cut off of 8, and underwent clinical assessment for depression with DSM 5 criteria. Out of those who scored positive with GDS, 47 (92.16%) were clinically depressed.

Overall, 47 participants out of 200 were detected to have depression amounting to a prevalence of 23.5% (95% confidence interval 17.8-30). The majority of participants with depression ($n=26$, 13% of sample) had moderate depression.

179 underwent screening for dementia with MoCA. The mean MoCA score was 19.78 (SD + 5.92) out of 30, with minimum of 5/30 and maximum of 30/30. 130 (72.63%) screened positive with MoCA at a cut off of 24 out of 30. Following the clinical assessment according to DSM 5, only 26 (20%) were diagnosed with dementia.

The Prevalence of Dementia in the sample was 14.53% (95% confidence interval 9.7-20.6).

Table 1. Results of screening and clinical assessment for presence of delirium

Screening with CAM ($n=234$)			Clinical examination according to DSM 5 ($n=42$)		
	Frequency (n)	Percent (%)		Frequency (n)	Percent (%)
Positive	42	17.9	Positive	42	100.0
Negative	192	82.1	Negative	0	0
Total	234	100.0	Total	42	100.0

Table 2. Results of screening and clinical assessment for presence of depression

Screening with GDS ($n=200$)			Clinical examination according to DSM 5 ($n=51$)		
	Frequency (n)	Percent (%)		Frequency (n)	Percent (%)
Positive	51	25.5	Positive	47	92.16
Negative	149	74.5	Negative	4	7.84
Total	200	100.0	Total	51	100.0

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Table 3. Results of Screening and Clinical Assessment for Presence of Dementia

Screening with MoCA (n=179)			Clinical Assessment for Dementia According to DSM 5 (n=130)		
	Frequency (n)	Percent (%)		Frequency (n)	Percent (%)
Positive	130	72.63	Positive	26	20
Negative	49	27.37	Negative	104	80
Total	179	100.0	Total	130	100.0

Table 4. Summary of associations for delirium, dementia and depression

	Delirium			Depression			Dementia		
	Pearson ChiSquare	df	p	Pearson ChiSquare	df	p	Pearson ChiSquare	df	p
Age	0.547	2	0.038	0.502	2	0.778	12.198	2	0.002
Gender	0.66	1	0.798	1.272	1	0.259	0.004	1	0.947
Marital Status	0.377	1	0.539	12.064	1	0.001	0.006	1	0.937
Support from Others	1.948	1	0.163	4.412	1	0.036	0.107	1	0.743
Having Dependents	0.129	1	0.719	0.218	1	0.640	2.986	1	0.084
Living Circumstances	2.600	3	0.457	8.535	3	0.036	4.599	3	0.204
Financial Stability	1.876	1	0.171	1.575	1	0.210	0.199	1	0.656
Employment Status	3.114	1	0.078	1.762	1	0.184	0.832	1	0.362
Educational Level	0.833	2	0.659	2.514	2	0.284	1.337	2	0.512
Medical co-morbidity	7.035	2	0.030	0.497	2	0.780	1.832	2	0.400

Table 5. Rates of detection of and referral by the treating team

Total number with diagnosis		Detection by staff		Referral to Psychiatric services	
		Frequency (n)	Percent (%)	Frequency (n)	Percent (%)
Delirium	42	16	38.1	2	4.8
Depression	47	2	4.2	0	0
Dementia	26	2	7.7	1	3.8
Total	115	20	17.4	3	2.6

Out of the participants who had delirium, 5 were later diagnosed to have depression, while 2 were later diagnosed as having underlying dementia.

8 participants were found to have both dementia and depression.

Associations of delirium, depression and dementia

Pearson Chi-Square test was carried out to look for association of depression, dementia, and delirium with potential risk factors like age, gender, marital status, presence of social support, financial status, employment status, living circumstances, educational level and medical co-morbidity.

A statistically significant association was found between increasing age for delirium and dementia. Delirium was also associated with increasing medical co-morbidity. Depression was significantly associated with marital state and living circumstances.

Detection and referral of medical in-patients with delirium, depression and dementia by the treating team

Out of all the participants who were found to have delirium, depression or dementia in this study (n=105), only 17 (16.19%) were recognized by the treating team, and 2 (1.9 %) have been referred to psychiatric services.

Discussion

We found out that the prevalence of delirium, depression, and dementia among a sample of 234 medical in-patients above the age of 60 in a tertiary care hospital in Sri Lanka, to be 17.9%, 23.5%, and 14.53% respectively, using standard diagnostic criteria.

Only 4.3% of our sample had a previous diagnosis of a mental illness, and a relatively higher prevalence of delirium, depression and dementia in this sample indicates that majority of these cases are either new onset or

previously undiagnosed conditions. As a whole, prevalence rates for delirium, depression and dementia in this elderly medical in-patient sample appear to be higher, compared to those of the elderly population in the community in Sri Lanka [14,21] and this pattern has been observed elsewhere [22]. The finding of a 17.9% prevalence of delirium in older medical in-patients in a tertiary care hospital in Sri Lanka, in this study, is comparable with several other studies done in different parts of the world following a similar methodology. It is noteworthy that we only looked at the prevalence of delirium within 48 hours of admission to the hospital for the reason of feasibility, and therefore could have missed the cases of delirium with its onset after this period. Studies that also looked for incident delirium during the hospital stay have found much higher cumulative rates [25]. This study also suggests that CAM is a very good screening tool for delirium in older medical inpatients. Many of the patients who screened positive but did not fulfil the clinical criteria for depression were felt to be having adjustment difficulties secondary to their physical ill- health. Overall, GDS appeared to be a good tool to screen for depression in elderly population in the medical in-ward setting.

The prevalence of clinical depression in our sample was 23.5%. Previous studies, including community studies had not used a clinical assessment to confirm the diagnosis of depression following GDS (18, 23), however, considering GDS positivity, it appears that depression is much more prevalent in medical inpatients than the community. Interestingly, the rates of depression in older in-patients have been lower in the Europe (8,22) , while higher rates have been found in Nigeria (22.6%) and Egypt (30%) (10,26), which could possibly represent higher rates of depression in medically ill older people in developing countries.

A significant proportion of the sample; 72.63% screened positive for cognitive impairment with MoCA, a rate higher than that of other similar screening studies using different screening tools. The overall prevalence of dementia, 14.53% is comparable with a study done with a fairly similar methodology in patients with diabetes mellitus in Sri Lanka, [27]. A community survey showed a prevalence of 3.98%, and it demonstrates that rates of dementia can be much higher in medically ill older people [21]. Comparing our results to those of rest of the world, a relatively similar rate of 18.4% was found in a large sample of patients in 33 hospitals in Germany [28].

In our study, 72.63% screened positive with MoCA, while only 14.53% fulfilled standard criteria for dementia. We believe that most of the false positives could be explained by mild cognitive impairment, impaired attention and concentration due to acute physical ill health, sub-syndromic delirium, reduced engagement due to physiological and psychological stress associated

with acute physical ill health, or presence of depression. This finding perhaps suggests that screening for dementia should wait until the patient is feeling physically well.

In this study, we looked into several hypothesized associations between various bio- psycho-social factors and presence of delirium, depression and dementia, and a statically significant association could be found for delirium and dementia with age, delirium with medical co-morbidity, and depression with marital state and living circumstances.

The association between age and dementia is well known [29]. Our study did not show a significant association between dementia and educational level, something that a previous studies have well established [28,30]. Previous studies done among community dwelling older adults in Sri Lanka also has shown that depressive symptoms are associated with living alone and being unmarried, widowed or separated [16, 18]. Even though we could not establish a significant association with support from others, a few community studies have reported such an association [14,16,31]. We were unable to replicate the previously shown associations of elderly depression to female gender [14] and poor financial circumstances [14,15,31] in community samples in Sri Lanka. Studies done elsewhere have shown a relationship between depression and low educational level [32,33]. Although we were unable to show an association of depression with medical illness, previous Sri Lankan studies have done so [14,16,31].

This study shows that the rates of recognition of depression, delirium and dementia by the treating team at general medical in-wards are strikingly low. This could partly be due to poor documentation of the clinical findings. A low rate of recognition has been demonstrated in other parts of the world as well [22].

Delirium was the most recognized condition by the treating team (38.1%), which stands higher than some other countries. It is alarming that depression had the lowest rate of recognition and referral to psychiatry. In previous preliminary study conducted at NHSL, none of the patients who were identified as having depression were referred to psychiatry [20].

This study had some limitations. As the sample was taken from one of the leading tertiary care hospitals of Sri Lanka, it may not be fully representative of all the older medical patients in the country. Our sample was limited to the medical in-ward patients due to feasibility, therefore, data from other in-ward setups like surgical, orthopedic and gynecological wards could not be in-cooperated.

65% of our sample consisted of females, leading to a ratio of 54 males for 100 females, which is lower than that of the general older population [34]. This discrepancy could be due to more female than male older adults getting admitted to the medical wards. Only 179/234 participants completed all the stages of the study due to various reasons

and although a follow up review had been planned for those who could not complete the study during the ward stay, none of these patients turned up for the review as planned.

Being physically ill, and possible sub-syndromal delirium could have affected the screening process, especially for depression and dementia.

Conclusion

This study revealed that a significant proportion of older adults getting admitted to medical in-patient care suffer from delirium, depression, and dementia. It is alarming that only a small fraction of these patients are being identified by the treating team and referred for appropriate assessment and management. These results show the importance of the medical professionals involved in the care of medically ill older adults being adequately skilled and trained to identify these issues, introduction of guidelines and screening procedures to detect delirium, depression and delirium, strengthening liaison-psychiatry services and developing infrastructure of the medical wards to cater to the needs of these patients.

Further, multi-centered, large-scale research is needed to establish the rates of delirium, depression and dementia and factors associated with them in older in-patient population in Sri Lanka, including different in-patient settings.

Author Declaration: I declare that this work is original work of the above named authors and all authors contributed to the study conception and design, data collection, and analysis.

Acknowledgements: The study participants, colleagues and friends.

Declaration Conflict of Interest: None.

Declaration Sources Funding: None.

Ethical approval : Ethical approval has been obtained from the Ethics Review Committee of the National Hospital of Sri Lanka.

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