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Dear Doctor,

Greetings from Micro Labs. We are happy to bring you "Stroke Newsletter" which contains latest and interesting news in the field of Neuropsychiatry.

This issue contains:

1. **Association of cognitive and psychiatric symptoms in acute stroke patients experiencing delirium**
2. **Evaluation of Frequency of Pre-Stroke Cognitive Impairment and its Association with Premorbid Neuropsychiatric, Functional, and Neuroimaging Features**
3. **Investigation of prognostic impact of body mass index on clinical outcomes after acute ischemic and hemorrhagic stroke**
4. **Case report on functional neurological disorder presenting as stroke**

Should you require any specific article or medical information, please feel free to contact us at medicalservices@microlabs.in

Looking forward to your valuable feedback
Best Regards,
Medical Team, Micro Labs Ltd

STROKE

Vol 3|Issue 15|2024

Association of cognitive and psychiatric symptoms in acute stroke patients experiencing delirium

Introduction

Delirium is defined as a severe neuropsychiatric syndrome characterized by the acute onset of deficits in attention and other aspects of cognition. Patients frequently exhibit altered arousal, ranging from hypervigilance and extreme agitation to decreased responsiveness at a level close to coma.[1] Delirium usually occurs in the acute phase of stroke. Acute phase is defined as the initial seven day's post stroke. This condition usually occurs in 6.7–61% of patients with stroke and has an occurrence rate of 25%. In a recent study, delirium was associated with worse cognitive and psychiatric outcomes until 3 years post stroke.[2] So, this study aimed to evaluate global cognition, psychiatric symptoms in general and 12 specific psychiatric symptoms post stroke. And also examined if delirium predicts these symptoms after 3, 18 and 36 months after adjusting complications of stroke.

Methods

This was a longitudinal, multicenter, prospective cohort study and a part of Norwegian Cognitive Impairment After Stroke Study (Nor-COAST). This study included 373 patients diagnosed with delirium using the Confusion Assessment Method (CAM). Global cognitive function was measured by Montreal cognitive assessment (MoCA). Psychiatric symptoms were assessed during follow-up using Neuropsychiatric Inventory-Questionnaire (NPI-Q) either by self-report or by proxy. Hospital Anxiety and Depression Scale (HADS) was used for evaluation of self-reported symptoms of anxiety and depression. Follow-ups were performed after three, 18, and 36 months at the outpatient clinic visit.

Results

Out of 373 patients, 334 were included for having at-least one of the three follow-ups. About 81.3% percent of patients were admitted within a day of the onset of symptoms, with an average

hospital stay of 6.2 days. At baseline, 17 patients were diagnosed with delirium and the MoCA score of these patients was considerably lower than that of patients without delirium (n = 317). Intracerebral haemorrhage has been observed to be more common in delirious patients (35.3 % versus 8.9 %, p =0.004) than in non-delirious patients. Furthermore, at 3, 18, and 36 months, a greater proportion of delirium patients had GDS scores suggesting possible dementia. At 18 and 36 months, the mean MoCA scores of the delirious patients were lower than those of the non-delirious patients (Figure 1). The difference was largest at 36 months. In comparison to patients who were not delirious, individuals with delirium at 18 and 36 months had significantly higher mean scores for HADS-D (HADS-Depression), HADS-A (HADS-Anxiety), and HADS-T (HADS-Total). At all time-points, patients with delirium exhibited significantly higher NPI-Q total scores; the largest between group difference was observed after 36 months. Hallucinations and agitation were the specific psychiatric symptoms that patients with delirium was significantly more likely to report. Also, 23.5 % of delirium patients reported hallucinations at 3 months and 15.4% reported at 18 months. In the same way, agitation was observed by patients with delirium more frequently: 11.8% at 3 months, 23.1% at 18, and 14.2% at 36 months.

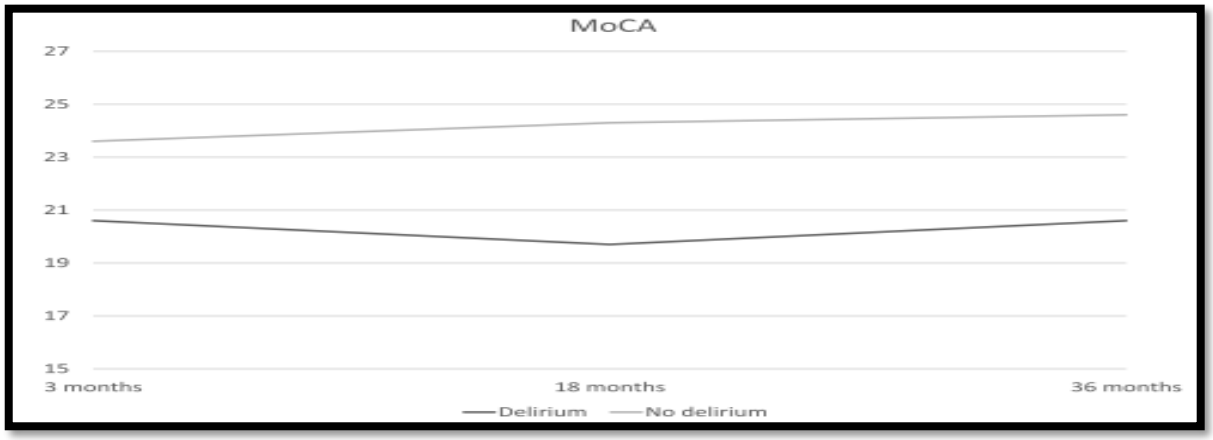

Figure 1. Montreal Cognitive Assessment scores over time in the groups with and without delirium at baseline.

Discussion

This study finding showed that in comparison to non-delirious patients, patients with delirium had significantly reduced global cognition (MoCA) after 18 and 36 months.[2] A similar result by Kowalska et al. found delirium effect during admission and three month's post stroke but not 12 month's post stroke.[3] Additionally, baseline MoCA scores were significantly lower in delirium patients. Furthermore, after 18 and 36 months, delirium had been associated to increased levels of depression (HADS-D) and anxiety (HADS-A). When taken together, this

suggests that the delirium group's post-stroke cognition decreased quite steadily, in contrast to the HADS data, which showed that group differences appeared at later time-points. At all time-points, patients with delirium had higher total scores on the NPI-Q, a measure of mental symptoms. In patients with delirium, intracerebral haemorrhages were common in acute phase (35.3%).[2] Hallucinations and agitation were more likely to occur in delirium patients and these results were similar with the Meagher et al. which found that agitation was more common in patients with persistent delirium.[4]

Conclusion

Delirium during the acute phase of a stroke may be a sign of an increased risk of cognitive and psychiatric symptoms during the chronic phase. Potential treatments and preventive actions for delirium in stroke patients could decrease the severity of the condition.

Patients with delirium in the acute phase of stroke developing cognitive and psychiatric symptoms in the chronic phase.

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Evaluation of Frequency of Pre-Stroke Cognitive Impairment and its Association with Premorbid Neuropsychiatric, Functional, and Neuroimaging Features

STROKE
Vol 3|Issue 15|2024

Introduction

One-third of patients admitted to a stroke unit had pre-stroke cognitive impairment.

Stroke is one of the leading cause of death with high morbidity rates seen globally. The chronic disabilities experienced by up to 50% of stroke survivors present a significant challenge to public health. Post-stroke dementia is a potential hazard for around 20% of stroke survivors.[1] To understand the effect of stroke on the risk of post-stroke dementia, pre-stroke cognitive status, including pre-stroke dementia and pre-stroke cognitive impairment (PCI), must be considered. The cognitive impairment that develops a stroke is called as pre-stroke cognitive impairment (pre-SCI).[2] This study aimed to evaluate the frequency of pre-SCI and its relation with premorbid behavioral and functional features and with vascular and degenerative neuroimaging factors.

Methods

This was a prospective study that included who were hospitalized for acute cerebrovascular event and who had an informant available during hospitalization. Pre-SCI was diagnosed if the IQCODE (Informant Questionnaire for Cognitive Decline in the Elderly) score was >3.3. assessment of pre-stroke includes NPI-Q (Neuropsychiatric Inventory Questionnaire), the basic Activities of Daily Living and Instrumental Activities of Daily Living scales, and the Clinical Dementia Rating (CDR)scale. the association of pre-SCI with age, sex, education, arterial hypertension, atrial fibrillation, white matter lesions, cerebral microbleeds, and pathological medial temporal lobe atrophy was evaluated using multivariate logistic regression model.

Results

A total of 474 patients were included. Out of which, 386 (81%) patients had ischemic stroke, 52 (11%) had hemorrhagic stroke, 36 (8%) had transient ischemic attack. Pre-SCI was present in 154 patients (32.5%) based on IQCODE (cut-off score, 3.3). All CT-based neuroimaging variables showed more severe in pre-SCI group. Patients with pre-SCI had higher NPI-Q scores, had lost independence in more Activities of Daily Living and Instrumental Activities of Daily Living scales, and had higher sum of boxes scores on the Clinical Dementia Rating scale than patients without pre-SCI. In addition, compared to patients without pre-SCI, patients with pre-SCI had higher scores in each of the CDR domains (Figure 1). When taking into account of neuroimaging with MRI (Magnetic resonance imaging), among 271 patients who underwent an MRI, 71 patients had a pre-SCI (26.2%). Age (odds ratio [OR], 1.05 [95% CI, 1.62–9.73]), white matter lesions (OR, 1.26 [95% CI, 1.003–1.58]), and a pathological medial temporal lobe atrophy score (OR, 3.97 [95% CI, 1.62–9.73]) were found to be independently

STROKE
Vol 3|Issue 15|2024

correlated with pre-SCI using multivariate logistic regression. In the 218 patients with ischemic stroke, White matter lesions (OR, 1.34 [95% CI, 1.04–1.72]) and medial temporal lobe atrophy (OR, 3.56 [95% CI, 1.38–9.19]) were linked to pre-SCI, but not age.

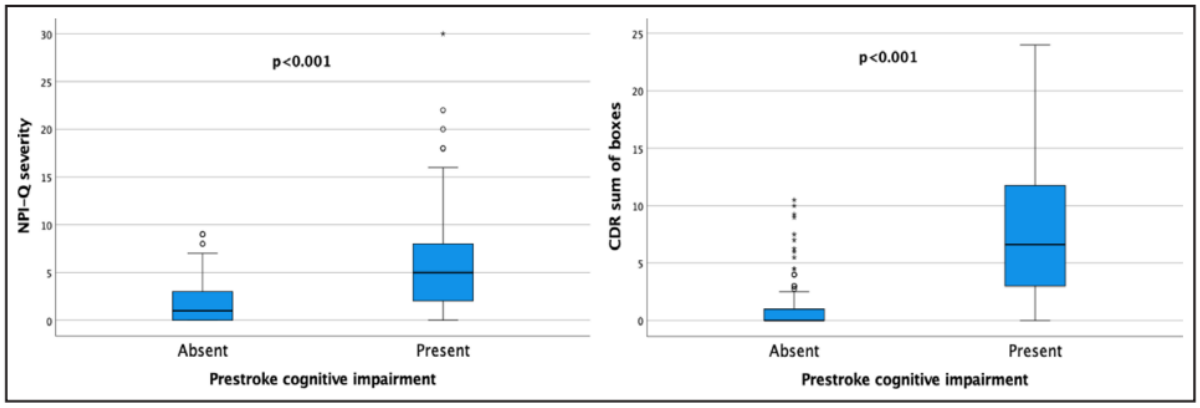

Figure 1. Patients with and without pre-stroke cognitive impairment having Neuropsychiatric symptoms and cognitive and functional impairment in daily living

Discussion

This study showed that one-third of patients admitted to a stroke unit are affected by pre-SCI. Results showed an association of pre-SCI with measures of pre-stroke neuropsychiatric symptoms and functional impairment.[2] Previous study have already shown association of an IQCODE based definition of pre-SCI with NPI-Q measures, loss of function on Activities of Daily Living and Instrumental Activities of Daily Living scales, and modified Rankin Scale, but have not been studied the association with the CDR domains and total score.[3] In this study, results showed association of white matter lesions with pre-SCI independently of age, sex, education, hypertension, and atrial fibrillation.[2] Banerjee et al. who previously investigated only in atrial fibrillation patients did not find any significant association between perivascular spaces and microbleeds with pre-SCI.[4] But this study results showed that perivascular spaces were not independently associated with pre-SCI and also showed at-least 2 microbleeds was associated with pre-SCI.

Conclusion

Pre-SCI was associated with pre-existing neuropsychiatric symptoms and functional performance in daily living and also pre-SCI was associated with neuroimaging biomarkers of both small vessel disease and neurodegeneration, suggesting that both processes were involved in its etiology.

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Investigation of prognostic impact of body mass index on clinical outcomes after acute ischemic and hemorrhagic stroke

Introduction

Maintaining an optimal body weight is required to ensure favourable post-stroke outcomes.

Stroke is the second leading cause of mortality and third leading cause of disability globally. Identifying risk factors associated with stroke outcomes has become more imperative. Among the risk factors, BMI (Body mass Index) is one which may lead to development of cardiovascular events, including stroke, and is an independent predictor of mortality in the general population.[1] Several studies have suggested that high BMI may increase risk of total stroke particularly ischemic stroke.[2] So, this study aimed to investigate association of BMI on clinical outcomes after acute ischemic and hemorrhagic stroke.

Methods

This is an ongoing hospital-based, multicenter, prospective registry of patients treated for acute stroke or transient ischemic attack. This study included adult patients (⩾18years) diagnosed with acute ischemic or hemorrhagic stroke who had available body weight and height data during admission. Patients were categorised based on BMI values which are as follows, (1)

STROKE
Vol 3|Issue 15|2024

under-weight: BMI <18.5, (2) normal weight:18.5 ≤ BMI < 23, (3) overweight: 23.0⩽BMI<25, (4) class I obesity: 25.0⩽BMI < 30 and (5) class II obesity: BMI ⩾30.0 kg/m^2. Primary outcome includes un-favourable functional outcome at discharge, defined as modified Rankin Scale (mRS) score of 5–6. The secondary outcomes include: (1) a favourable outcome, defined as mRS score of 0–2; (2) distribution of mRS score; and (3) in-hospital all-cause mortality.

Results

A total of 56,230 patients were included for final analysis, out of which, 43,668 of whom were diagnosed with ischemic stroke (IS), 9741 of were diagnosed with Intracranial haemorrhage (ICH), and 2821 of whom were diagnosed with subarachnoid hemorrhage (SAH). In the IS group compared to those who were obese, underweight patients had higher NIHSS score, the duration of hospitalization was longer, and the baseline systolic blood pressure and diastolic blood pressure were lower. Patients with a BMI ⩾30.0kg/ m^2 were positively associated with unfavorable outcomes and in hospital mortality in large artery stroke. Underweight individuals in IS and all IS subtypes had a higher risk of experiencing unfavourable outcomes than did those with normal weight whereas in hemorrhagic stroke group, underweight patients with ICH were associated with unfavorable outcomes. In patients with ICH lower BMI levels (<23) were associated with higher risk of unfavorable outcomes (Figure 1).

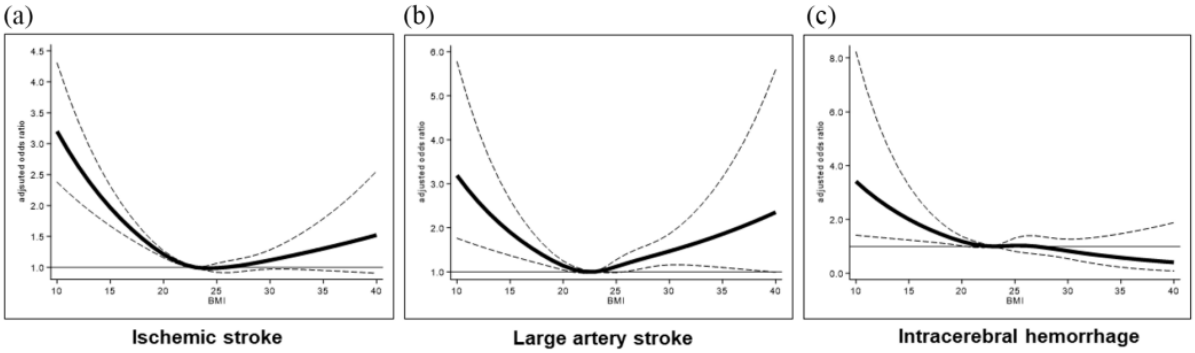

Figure 1. Associations between BMI and unfavorable outcomes (a) overall ischemic stroke; (b) large artery stroke; (c) intracerebral hemorrhage

Discussion

This study showed that being underweight was consistently associated with higher risks of unfavorable functional outcomes after IS and ICH, but not after SAH. Being overweight was associated with lower frequency of unfavorable outcomes in patients with overall IS or small-vessel occlusion, compared with the outcomes in those with normal weight. Patients with a

BMI ⩾30.0kg/m^2 was another high-risk factor for mortality.[2] Results of previous study have also stated that higher BMI tended to be younger in age, with more frequent metabolic risk profiles (hypertension, diabetes, dyslipidemia).[3]

Conclusion

BMI has a significant effect on functional outcomes following IS and ICH. Lower BMI affected post-stroke disability and mortality, while higher BMI values similarly affected these outcomes after large artery stroke.

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Case report on functional neurological disorder presenting as stroke

Introduction

Functional neurological disorder (FND) is a common cause of persistent and disabling neurological symptoms which includes abnormal control of movement (e.g. weakness, tremor, dystonic posturing), episodes of altered awareness resembling epileptic seizures (functional/dissociative seizures) and abnormal sensation. Additional symptoms include fatigue, pain and cognitive difficulties.[1] This disorder usually appears between late childhood and early adulthood, and can also occur at any age and was more prevalent in women. Diagnosis of this disease was based on medical history and treatment includes pharmacotherapy, psychotherapy but in some cases hypnosis or physiotherapy.[2] This report describes a case of FND whose resolution was complicated by the finding of a vascular intracranial abnormality that might account for some of the initial symptoms but not all of the later manifestations.

STROKE
Vol 3|Issue 15|2024

Case presentation

A 75 years old female complained that she had a stroke clinically characterized by slurred speech, imbalance, and confusion that lasted for 48h without consequences. Due to this, Magnetic resonance imaging (MRI) of brain was performed that showed chronic white matter disease (leukoaraiosis) (Figure 1) and brain CT angiography (CTA) showed the presence of carotid tortuosity and stenosis due to myointimal plaques (Figure 2). For this consequences, patient was prescribed with barnidipine 20mg (one tablet/day), clopidogrel 75mg (one tablet/day), and atorvastatin 20mg (one tablet/day). Later on, patient experienced recurrent dizzying attacks characterized by sudden onset, subjective vertigo, absence of nausea and vomiting, unsteadiness of balance with wide-base walking, and the need to use supports while walking. Due to these conditions, patient's symptoms were diagnosed as recurrent minor strokes. These symptoms increased progressively which lead to patient's autonomy. Romberg's test showed positive as the unsteadiness worsened considerably by asking the patient to remain upright with her eyes closed. Index–nose test showed weakly positive, especially on the right. Transcranial Doppler (TCD) showed tortuosity of the carotid vessels and the myointimal plaques. Taking into account of all the conditions, diagnosis was made as functional disorder. Treatment was started with vortioxetine 5mg to be increased to 10mg once daily. Upon follow up progressive improvement of the dizziness symptoms with a reduction in the intensity and frequency of the episodes was noted.

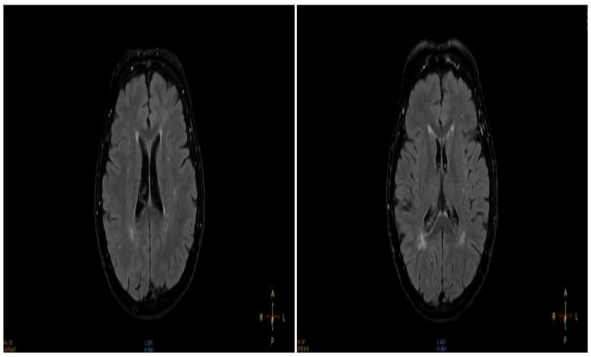

Figure 1. MRI showing multifocal lesions of the periventricular white matter.

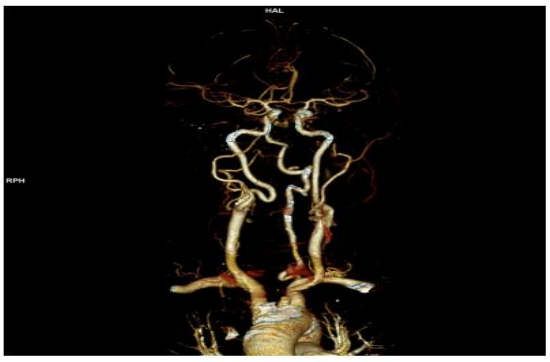

Figure 2. CTA showing carotid kinking

Discussion

This study finding on the initial phase led to the incorrect diagnosis in which CT angiography showed myointimal plaques in the carotid arteries induced an overestimation of the vascular

stenosis. These factors along with the symptoms complained by the patient, led to an incorrect diagnosis. FND appeared complex to diagnose and led to long diagnostic and therapeutic paths because they often mimic other pathologies. Upon diagnosis, patient was treated with vortioxetine which improved her condition upon follow up.[2] Previous studies have shown that using teleconsultation and the digitalized medical record shared among all the professionals involved could facilitate their interaction increasing the effectiveness of health care actions in these type of patients.[3]

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