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Screening dysphagia post acute stroke using MASA

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Abstract

Background and Objectives: Swallowing difficulties (dysphagia) is a common symptom following stroke and are associated with adverse health outcomes, dehydration, malnutrition, pneumonia and even death. The aim of this study was to analyze the type and severity of dysphagia using standardized test Mann Assessment of Swallowing Ability (MASA) screening tool across different types of stroke and specific to site of brain infarct. Methodology: This is observational study in which MASA test was administered in 60 subjects admitted to tertiary care hospital following acute stroke between January to October 2017. The age of the study subjects was in the range of 20 -75 years. Results: The results revealed that majority of the study subjects i.e., 80 % of stroke patients analyzed were due to ischemic cause followed by 15% with hemorrhagic stroke, and in remaining 5% of study subjects' hematoma was cause of dysphagia. The results of MASA delineated that majority of the study subjects i.e., 48% had mild dysphagia with no aspiration followed by 30% had mild dysphagia with aspiration, 11% had moderate dysphagia with mild aspiration, and 7% had moderate dysphagia with moderate aspiration risk, and 4% of study subjects had severe aspiration risk. Conclusion: Screening of subjects with acute stroke for dysphagia is essential for early identification and prevention of aspiration risk, which in turn helps to reduce the length of hospital stay and hospital cost.

Key words: Aspiration, Dysphagia, Mann Assessment of Swallowing Ability (MASA), Stroke.

Introduction

Dysphagia is one of the most common consequences following stroke, which occurs in 27% to 64% of stroke patients [1–3]. In acute post-stroke patients, the incidence of dysphagia is approximately 50% [4]. Dysphagia can improve spontaneously by 2 weeks after the stroke, however, 15% of patients will still have swallowing dysfunction for few months to years with stroke onset [5,6]. Dysphagia is a major risk factor for developing aspiration pneumonia. There is a three times higher risk of developing pneumonia in stroke patients with dysphagia compared to patients without dysphagia. As many as 22–52% of patients with dysphagia aspirate, and the risk of developing pneumonia is 11 times higher following acute stroke. In addition, aspiration pneumonia is associated with a three times increased mortality risk following acute stroke patients. Dysphagia after stroke has many complications, including malnutrition, dehydration, and aspiration pneumonia [7,8].

The act of swallowing is complex, not only peripherally but also centrally. Swallowing is essentially a reflex, which follows a set pattern controlled by the brainstem. The swallow is a synchronous and continuous event when triggered. Stroke affects swallowing at multiple levels due to the interruption of the feedback loop, with recovery depending on the cortical recovery [9].

With ageing, the incidence/prevalence of dysphagia increases following acute stroke. Many older people will have presbyphagia, and depending on their frailty, the prevalence of dysphagia may be as high as 70 % with acute stroke. Until today, dysphagia after stroke is an underdiagnosed and undertreated condition around the world, and most patients do not receive comprehensive care [10]. Current treatment for dysphagia in post-stroke includes swallowing retraining, speech and language therapy, dietary modification, and so on [11].

Hinchey *et al.*, showed that systematic use of a formal dysphagia screening protocol can decrease pneumonia rates from 5.4 to 2.4% [12]. So, dysphagia management guidelines, developed by the Heart and Stroke Foundation of Ontario (HSFO), emphasize that all patients with acute stroke have to be kept 'nil by mouth' (NPO) including medications until their swallowing safety has been established. According to these guidelines, swallowing ability of all stroke patients should be screened as soon as they are awake and alert. Thereby it's clearly recommended that screening for dysphagia post stroke is essential to minimize aspiration risk.

With this scenario, the present study was conducted with the main aim to analyze the type and severity of dysphagia using Mann Assessment of Swallowing Ability (MASA) screening tool across different type of stroke and specific to site of brain infarct.

Methodology

Participants and study period

In this study we enrolled a total of 60 subjects admitted to tertiary care hospital following acute stroke between January to October 2017. The age of the study subjects was in the range of 20 -75 years.

MASA has 24 subsections whis is tested for validity and reliability with neurogenic dysphagia. It takes around 20-30 minutes for test administration. This tool helps to categorize severity of dysphagia into 4: No abnormality, mild, moderate and severe dysphagia as well as the presence/absence of aspiration risk.

Results

The results revealed that majority of the study subjects *i.e.,* 80 % of stroke patients analyzed were due to ischemic cause followed by 15% with hemorrhagic stroke, and in remaining 5% of study subjects' hematoma was cause of dysphagia. The results of MASA delineated that majority of the study subjects *i.e.,* 48% had mild dysphagia with no aspiration followed by 30% had mild dysphagia with aspiration, 11% had moderate dysphagia with mild aspiration, and 7% had moderate dysphagia with moderate aspiration risk, and 4% of study subjects had severe aspiration risk. The below figure depicts severity of dysphagia specific to site of brain infarct.

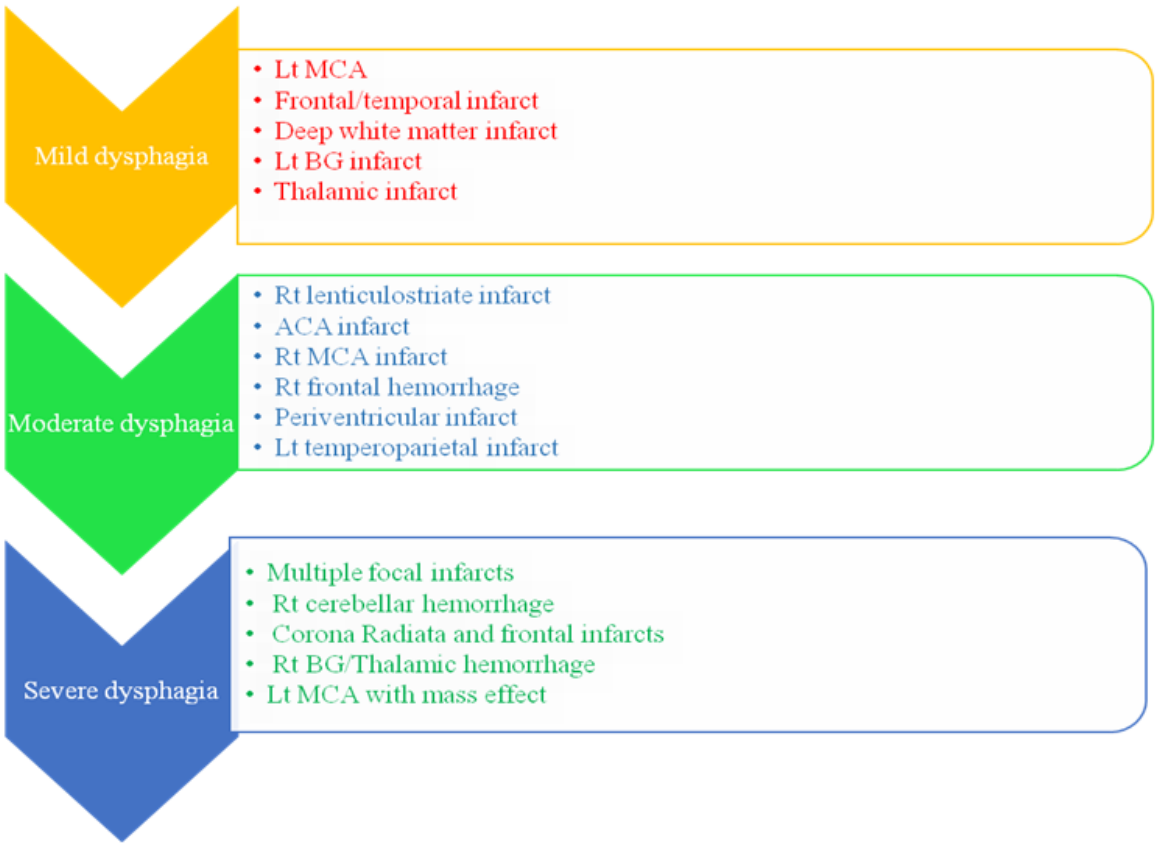

Figure-1: Shows analysis specific to site of brain infarct following stroke and severity of dysphagia identified based on MASA scoring

Discussion

Dysphagia in the absence of other neurological symptoms and signs has been reported in literature for patients with lacunar infarcts and periventricular white matter ischemic changes [14]. Majority of the patients at risk of aspiration are likely to have lesions of the periventricular white matter [15]. It has also been revealed in the

literature that patients with haemorrhagic stroke are significantly more likely to have swallowing problems than those with ischemic stroke. Frontal cortex infarct is associated with a significant risk of prolonged dysphagia and slow recovery.

Ischemic lesions in the territory of the left middle cerebral artery have been shown to cause impaired oral stage, problems with labial, lingual, and mandibular coordination, apraxia, and a prolonged pharyngeal transit time which is also supported by Shaheen, 2006. Basal ganglia stroke may result from damage to the sensorimotor pathways between the cortex and brainstem. This emphasize the importance of cortical input to the brainstem swallowing center in maintaining the systematic modulations characteristic of normal swallowing physiology. Research reveals that lesions in cerebellum, Thalamus, Putamen & frontoparietal region can result in mainly oropharyngeal dysphagia (Sue Curffman, 2006). Thalamic and frontal lesions typically can result in severe dysphagic symptoms with slow recovery.

The MASA score is a reliable tool for evaluating the risk of swallowing dysfunction and can be used at the patient's bedside with no special instruments [16-18]. The MASA includes the items of alertness, cooperation, and auditory comprehension related to patient's cognitive function as well as swallowing assessment items. As mentioned above, the MASA includes evaluation items for cognitive function and patients with cognitive impairment following stroke are more likely to have a low score and are classified as having dysphagia or a higher risk of aspiration. In our study the results of MASA showed 48% had mild dysphagia with no aspiration, 30% had mild dysphagia with aspiration, 11% had moderate dysphagia with mild aspiration, 7% with moderate dysphagia with moderate aspiration risk and 4% with severe aspiration risk.

Cognitive impairment is a major and common problem in the patients with brain infarcts. In a previous study reported by Avery-Smith and Dellarosa demonstrated the relationship between dysphagia and cognitive impairment in patients following stroke [19]. Patients with attention, cognitive-perceptual, and behavioral disorders experience swallowing disorders [20-22]. Dysphagia after stroke is not only limited to brainstem involvement, but silent aspiration is more likely to occur [24]. Patients with significant sensory deficits also have increased risk of aspiration [25].

Conclusion

Screening of subjects with acute stroke for dysphagia is essential for early identification and prevention of aspiration risk, which in turn helps to reduce the length of hospital stay and hospital cost. Furthermore, dysphagia rehabilitation is vital to improve quality of life subjects suffering from acute stroke.

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- **Availability of data and materials :**Data available for review as needed
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