LUPINE PUBLISHERS

Lupine Online Journal of Medical Sciences

DOI: 10.32474/LOJMS.2020.05.000206

ISSN: 2641-1725

Short Communication

Importance of Fast Brain MRI to confirm the Acute Stroke diagnosis after Thrombolysis

Vickram Singh[1]*, Dip Mukhopadhyay[2], H White[3], H Alosaimi[3] and A Milligan[3]

[1]*MBBS Cardiology and GIM (General Inter Medicine) Registrar, Princess of Wales Hospital, UK*

[2]*MD DGM RCPathME MSc FRCP Consultant Physician Stroke Medicine Princess of Wales Hospital, UK*

[3]*Whilst working on the Stroke Unit in Princess of Wales Hospital, UK*

***Corresponding author:** Vickram Singh MBBS, MRCP-UK, Cardiology and GIM (General Inter Medicine) Registrar, Princess of Wales Hospital, CF31 1RQ, Bridgend, Wales, UK

Received: March 23, 2020 **Published:** June 12, 2020

Abstract

Fast Brain MRI Protocol: Use of limited-sequence Brain MRI to confirm the diagnosis of stroke and identify 'Stroke Mimics' after negative initial neuroimaging following stroke thrombolysis.

Keywords: Stroke; thrombolysis; fast mri magnetic resonance imaging with limited sequence; ct-head computerized tomography of the head

Introduction

Various studies have shown that a significant proportion of patients presenting as acute ischaemic stroke and thereby receiving stroke thrombolysis may have 'Stroke Mimics'. Due to the time constrain in differentiating the true stroke from stroke mimics and limited availability of the timely MRI head these patients are not identified at stroke thrombolysis. However, diagnostic clarity is necessary thereafter for the appropriate management of such patients. A limited sequence 'Fast Brain MRI protocol' was introduced in our stroke unit to identify such 'Stroke Mimics' after thrombolysis. This 5-minute fast Brain MRI protocol included axial FLAIR and DWI sequence.

Methods

We evaluated all acute ischaemic stroke patients receiving thrombolysis in a DGH over 12 months. All thrombolysis patients received a routine CT Head 24 hours after receiving thrombolysis. Those patients with negative neuroimaging for an infarction at 24 hour received MRI Brain. A limited-sequence 'Fast Brain MRI protocol' was introduced in our stroke unit, this 5-minute fast Brain MRI protocol included axial FLAIR and DWI sequence.

Results

Out of total 1200 patents referred with a possible diagnosis of stroke or stroke-like event over the 12 months between August 2017 to July 2018, 223 patients were within the thrombolysis window. 53 of them received stroke thrombolysis (thrombolysis rate 24%). f 14 out of these 53 patients (26%) were neuroimaging negative at 24hour CT and hence ended up having Fast MRI of their head. Out of this 14 thrombolysis but initial neuroimaging-negative patients 6 patients (11% of total thrombolysis cases) were noted to have DWI-negative MRI Brain scan and hence identified as 'Stroke Mimic' who has received thrombolysis [1,2]. Out of 14 thrombolysis but initial neuroimaging-negative cases 64% (9 out of 14) were confirmed to have a stroke after MRI scan and 36% (5 out of 14) were negative for any recent infarction.

Discussion

In our study, we noticed that the majority of patient with suspected acute ischaemic stroke and thereby receiving stroke thrombolysis were confirmed to have a cerebral infarction. Only 11% of thrombolysed stroke was confirmed as 'Stroke mimic'. We

concluded that thorough initial assessment and full NIHSS scoring had taken place in all these cases before thrombolysis (Tables 1 & 2). Unless a 'Fast Brain MRI' scan protocol is readily available without any delay prior to stroke thrombolysis it would not be possible to completely exclude the stroke, mimics receiving thrombolysis; as there is always anxiety that we might deny the thrombolysis to the genuine patients otherwise.

Table 1: Basic demography of the patients with acute stroke within the thrombolysis window.

	Total Patients	Received Thrombolysis	Not Received Thrombolysis
Total Code Stroke-1	223	53 (24%)	170 (76%)
Female	114	24 (21%)	90 (79%)
Male	109	29 (27%)	80 (73%)
Average Age – Male	66 years	65 years	66 years
Average Age – Female	69 years	70 years	65 years
Average Age – All Patients	67 years	67 years	67 years

Table 2: Initial CT Head negative patients subsequent have fast Brain protocol MRI.

	Number of Patients	Percentage of Patients
Total Code Stroke-1 Patients Analysed	223	19 % of Total referred patients with Stroke or stroke-like symptoms (1200)
Thrombolysis Received	53	24% of Total Code Stroke-1
Initial Neuro Image Negative (CT)	14	26% of Total Thrombolysed
MRI-DWI: Confirmed the Stroke	9	64% of Negative Initial Scan
MRI-DWI: No Evidence of Recent Stroke (Stroke Mimic)	5	36% of Negative Initial Scan

Footnotes

First Author; Dr Vickram Singh, Other Authors are Dr H White, Dr H Alosaimi, Dr A Milligan, Supervising Consultant and co-author Dr D Mukhopadhyay. Princess of Wales Hospital, Bridgend, Wales, UK.

a. Contributors: Dr V Singh produced this manuscript which was proofread by Dr D Mukhopadhyay.

Funding

None.

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