

# **White Matter Hyperintensities (WMHs) in Patients with Sporadic Hemiplegic Migraine (SHM)**

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**ASN 42<sup>ND</sup> ANNUAL MEETING  
JANUARY 24-26, 2019**



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# DISCLOSURES

I have no disclosures

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# Introduction

- ❖ Hemiplegic Migraine is rare type of headache
- ❖ Two different forms of Hemiplegic Migraines exist – Sporadic and Familial Hemiplegic Migraine.
- ❖ The estimated prevalence of Sporadic Hemiplegic Migraine(SHM) is around 0.005%.
- ❖ The most common clinical symptoms of SHM includes headache with aura ( sensory, motor, brainstem symptoms, aphasia) along with motor weakness.
- ❖ Imaging findings - Diffuse cortical and subcortical hyperintensities along with cortical edema contralateral to the weakness. These findings are often reversible on follow-up imaging.

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# Aim

- ❖ Our aim is to study the prevalence of White Matter Hyperintensities (WMH) in patients with SHM and compare it with those with migraine headache (includes both episodic and chronic migraines).

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# Methods

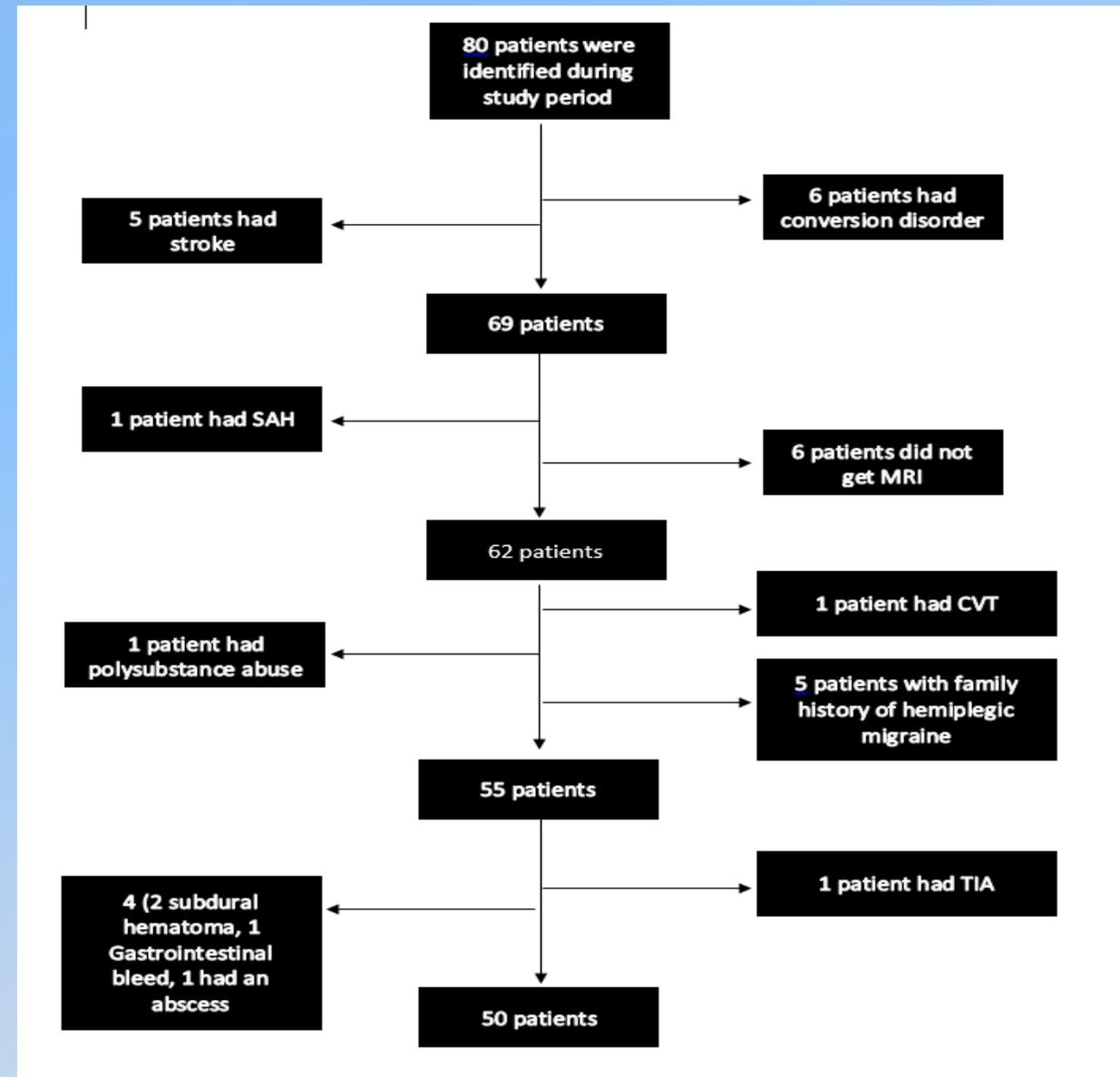
## INCLUSION CRITERIA

- ❖ Patients who met the diagnostic criteria for SHM proposed by International Classification of Headache Disorders (ICHD) -3
- ❖ MRI imaging should be done before being discharged from the hospital
- ❖ Patients with Migraine Aura (MA) and Migraine without aura (MO) who met the diagnostic criteria proposed by ICHD-3 from our outpatient neurology clinics were used as controls for this study

## EXCLUSION CRITERIA

- ❖ Patients who did not and couldn't have MRI imaging
- ❖ Patients with structural abnormality on MRI and other confounding factors for headache with focal motor weakness.

- ❖ 80 Patients were identified during our study period between June 2016 and September 2018.
- ❖ 50 patients met our inclusion criteria.
- ❖ 100 patients with migraine headache were identified and used as a controls.
- ❖ Basic Demographics ( Age , Sex, Race) were assessed for both cases and controls.
- ❖ National Institute of Health Stroke Scale (NIHSS) score for patients of SHM that presented with acute neurological symptoms was calculated both at the time of presentation and 24 hours after admission.
- ❖ Modified Rankin Scale (mRS) was calculated during discharge and at one month follow up.



# Analyzing White Matter Hyperintense Lesions on MRI brain

- ❖ WMH lesions had to appear as a hyperintense signals on both T2 weighted and FLAIR images, but hypo or isointense on T1 weighted images.
- ❖ WMHs are classified based on the location as frontal, parietal, temporal, occipital, basal ganglia, and infratentorial region.
- ❖ Based on the size, these WMH lesions were classified into those with size <3mm, 3-5mm, 5-10mm and >10mm in diameter.
- ❖ White matter burden was graded using Scheltens visual rating scale



# RESULTS

	<b>SHM</b>	<b>Migraine Headache</b>	<b>p- value</b>
<b>Sex</b>	<b>Male 14 (28%) Female 36(72%)</b>	<b>Male 25 (25%) Female 75 (75%)</b>	<b>p=0.693</b>
<b>Age</b>	<b>47.7± 12.2years</b>	<b>48.17 ± 9.7 years</b>	<b>p=0.814</b>
<b>WMH</b>	<b>28 (56%)</b>	<b>44 (44%)</b>	<b>p=0.166</b>

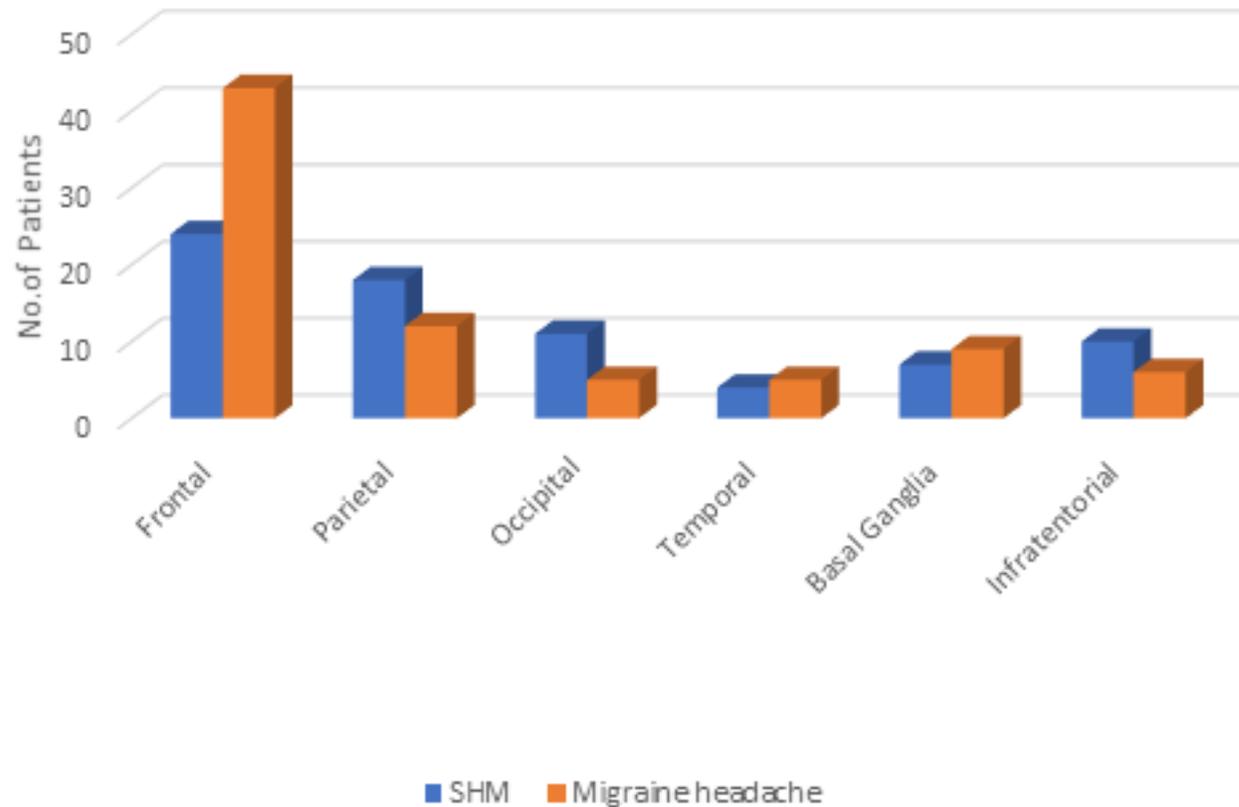
- ❖ The mean initial NIHSS on admission was (4.43± 3.2) and after 24 hours was(1.55 ± 1.5).
- ❖ The mean modified Rankin Scale (mRS) was 0 at discharge from the hospital
- ❖ At one month follow up , mRS score was 0

# Univariate Analysis

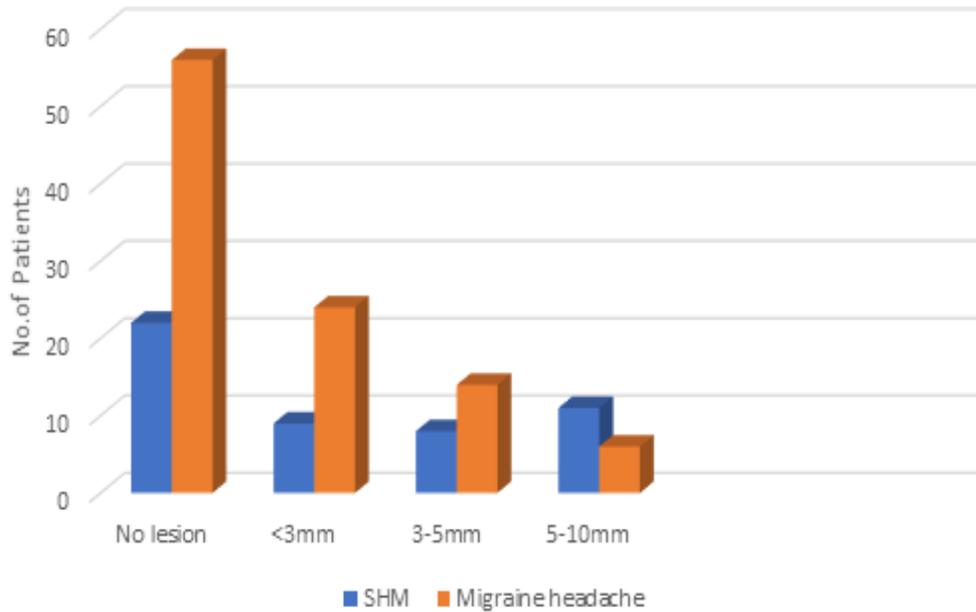
Location of WHLs	SHM n(%)	Migraine headache n (%)	p value
Frontal	24(48%)	43(43%)	.561
Parietal	18(36%)	12(12%)	<.001
Temporal	4(8%)	5(5%)	.347
Occipital	11(22%)	5(5%)	.001
Infratentorial	10(20%)	6(6%)	.009
Basal Ganglia	8(16%)	9(9%)	.350



## Distribution of white matter Hyperintensities (WMHs) in both group



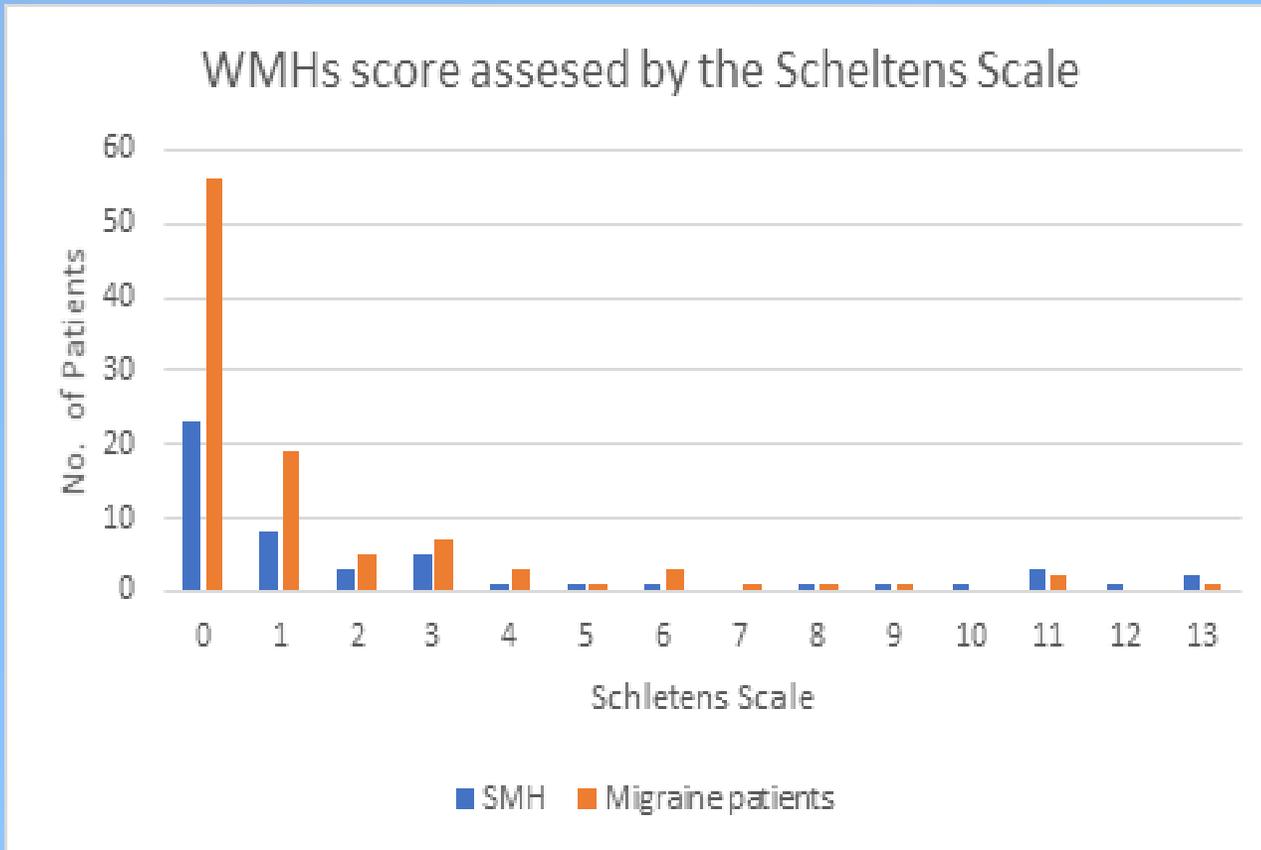
### Diameter of White Matter Hyperintensities (WMHs) in both group



Lesion Size	SHM n(%)	Migraine Headache n(%)	p value
< 5mm	17 (60%)	38 (90%)	0.462
> 5mm	11 (40%)	6 (10%)	<b>0.007</b>



# Scheltens visual rating scale



- ❖ The mean score of WMH in SHM was ( $2.9 \pm 4.25$ ) and ( $1.45 \pm 2.6$ ) in migraine patients
- ❖ The severity of WMH is more in patients with SHM ( $p=0.001$ )

# Multivariate Analysis

Variables	Odds Ratio	95% CI	P value
Parietal	3.972	1.044-15.118	<b>0.043</b>
Occipital	3.173	0.677-14.865	0.143
Infratentorial	3.013	0.600-15.123	0.180
>5mm WHLs	0.182	.0.17-2.002	0.164
Visual analog Rating scale	0.750	0.534-1.054	<b>0.097</b>



# Conclusion

- ❖ The high prevalence of WMHs were noted in parietal lobe and severe white matter burden in patients with SMH when compared to those with migraine headache.

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