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CLINICAL PROFILE AND CORRELATION OF COMPUTED TOMOGRAPHY AND MAGNETIC RESONANCE IMAGING FINDINGS IN PATIENTS PRESENTING WITH TRANSIENT ISCHEMIC ATTACK: A HOSPITAL-BASED OBSERVATIONAL STUDY

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ABSTRACT **Background:** Transient ischemic attack (TIA) is an important predictor of future ischemic stroke and represents a medical emergency requiring prompt evaluation. Neuroimaging /and guiding therapeutic decisions. This study evaluated the clinical profile of patients presenting with TIA and assessed the correlation between computed tomography (CT) and magnetic 8resonance imaging (MRI) findings. **Methods:** A hospital-based observational study was conducted in the Department of Medicine, ACPM Medical College and Hospital, Dhule, Maharashtra, India, from January 2024 to May 2025. Sixty patients clinically diagnosed with transient ischemic attack were included. Detailed clinical evaluation, laboratory investigations, carotid Doppler ultrasonography, CT brain, MRI brain, and selected digital subtraction angiography studies were performed. CT and MRI findings were analyzed and correlated statistically. **Results:** The mean age of the study population was 64.67 years, with the highest proportion of patients belonging to the 60–70 years age group (38.3%). Males constituted 56.7% of patients. Hypertension (65%), dyslipidemia (61.7%), hyperhomocysteinemia (58.3%), diabetes mellitus (35%), and ischemic heart disease (30%) were the predominant risk factors. CT brain demonstrated abnormalities in 13 patients (21.7%), whereas MRI detected abnormalities in 32 patients (53.3%). Among 60 patients, 28 (46.7%) had both CT and MRI negative findings, 19 (31.7%) had CT-negative but MRI-positive findings, and 13 (21.7%) had both CT and MRI positive findings. MRI demonstrated a substantially higher diagnostic yield compared with CT. A statistically significant association was observed between CT and MRI findings ($p < 0.05$). **Conclusion:** TIA predominantly affects older adults and is strongly associated with conventional vascular risk factors. MRI demonstrated a significantly higher diagnostic yield than CT and detected ischemic abnormalities missed on CT imaging. MRI should be considered an essential component of the evaluation of patients presenting with TIA.

KEYWORDS : Transient Ischemic Attack; Magnetic Resonance Imaging; Computed Tomography; Cerebrovascular Disease; Diffusion Weighted Imaging; Neuroimaging; Stroke Risk Factors; Cerebral Ischemia.

INTRODUCTION

Transient ischemic attack (TIA) is defined as a transient episode of neurological dysfunction resulting from focal cerebral, spinal cord, or retinal ischemia without evidence of acute infarction. TIA represents an important warning sign of impending stroke, with the highest risk occurring during the first few days following symptom onset.

The burden of cerebrovascular disease continues to increase globally, particularly among elderly individuals with vascular risk factors such as hypertension, diabetes mellitus, dyslipidemia, smoking, and cardiovascular disease. Early diagnosis and timely intervention in TIA patients can significantly reduce the risk of subsequent stroke and associated morbidity.

Neuroimaging plays a pivotal role in the diagnostic evaluation of TIA. Computed tomography (CT) remains the most readily available imaging modality and is frequently used as the initial investigation. However, magnetic resonance imaging (MRI), particularly diffusion-weighted imaging (DWI), has demonstrated superior sensitivity for detecting acute ischemic lesions.

The present study was undertaken to evaluate the clinical profile of patients presenting with transient ischemic attack and to assess the correlation between CT and MRI findings.

METHODS

Study Design and Setting

This hospital-based observational study was conducted in the Department of Medicine, ACPM Medical College and Hospital, Dhule, Maharashtra, India, from January 2024 to May 2025.

Study Population

A total of 60 patients clinically diagnosed with transient ischemic attack were included in the study.

Inclusion Criteria

- Patients clinically diagnosed with transient ischemic attack.
- Patients willing to participate in the study.

Exclusion Criteria

- Patients with established ischemic or hemorrhagic stroke.
- Patients with intracranial tumors or other neurological disorders mimicking TIA.
- Patients unwilling to participate.

Study Procedure

All patients underwent detailed history taking, clinical examination, and neurological assessment. Laboratory investigations including blood glucose, lipid profile, renal function tests, and serum homocysteine levels were performed.

Neuroimaging evaluation included CT brain and MRI brain. Carotid Doppler ultrasonography was performed in all patients. Digital subtraction angiography was performed when clinically indicated.

Statistical Analysis

Data were analyzed using appropriate statistical methods. Continuous variables were expressed as mean values, while categorical variables were presented as frequencies and percentages. Association between CT and MRI findings was assessed using the Chi-square test. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 60 patients were enrolled in the study.

Table 1. Demographic Characteristics

Variable	Number	Percentage (%)
Male	34	56.7
Female	26	43.3
Total	60	100
Mean Age	64.67 years	-

The majority of patients belonged to the 60–70 years age group (38.3%).

Table 2. Distribution of Major Risk Factors

Risk Factor	Number	Percentage (%)
Hypertension	39	65.0
Dyslipidemia	37	61.7
Hyperhomocysteinemia	35	58.3
Diabetes Mellitus	21	35.0
Ischemic Heart Disease	18	30.0

Hypertension was the most prevalent risk factor, followed by dyslipidemia and hyperhomocysteinemia.

Table 3. CT Brain Findings

CT Finding	Number	Percentage (%)
Positive	13	21.7
Negative	47	78.3
Total	60	100

Table 4. MRI Brain Findings

MRI Finding	Number	Percentage (%)
Positive	32	53.3
Negative	28	46.7
Total	60	100

MRI detected abnormalities in more than half of the study population.

Table 5. Correlation Between CT and MRI Findings

CT Findings	MRI Positive	MRI Negative	Total
CT Positive	13	0	13
CT Negative	19	28	47
Total	32	28	60

Among 60 patients, 28 (46.7%) had both CT and MRI negative findings, 19 (31.7%) had CT-negative but MRI-positive findings, and 13 (21.7%) had both CT and MRI positive findings. A statistically significant association was observed between CT and MRI findings ($p < 0.05$).

DISCUSSION

The present study evaluated the clinical characteristics and neuroimaging findings of patients presenting with transient ischemic attack. The mean age of the study population was 64.67 years, with the majority of patients belonging to the elderly age group. Male predominance was observed, which is consistent with previous studies evaluating cerebrovascular disease.

Hypertension emerged as the most common risk factor, followed by dyslipidemia, hyperhomocysteinemia, diabetes mellitus, and ischemic heart disease. These findings emphasize the contribution of conventional vascular risk factors to the development of TIA and subsequent ischemic stroke.

CT brain demonstrated abnormalities in only 21.7% of patients, whereas MRI detected abnormalities in 53.3% of patients. Importantly, 31.7% of patients with negative CT findings showed positive MRI findings, highlighting the superior sensitivity of MRI in detecting ischemic lesions. These findings are consistent with previous studies that have demonstrated the greater diagnostic utility of MRI, particularly diffusion-weighted imaging, in patients presenting with transient neurological deficits.

The significant association observed between CT and MRI findings indicates that imaging abnormalities identified by CT are generally confirmed by MRI. However, MRI provided substantial additional diagnostic information and identified lesions missed by CT. This improved diagnostic yield may assist clinicians in establishing the etiology of symptoms and implementing appropriate secondary stroke prevention strategies.

The present study was limited by its single-center design and relatively small sample size. Larger multicentric studies may further clarify the role of advanced neuroimaging in TIA evaluation.

CONCLUSION

Transient ischemic attack predominantly affects older adults and is strongly associated with conventional vascular risk factors such as hypertension, dyslipidemia, hyperhomocysteinemia, diabetes mellitus, and ischemic heart disease. MRI demonstrated a significantly higher diagnostic yield than CT and detected ischemic abnormalities missed by CT imaging. MRI should be considered an essential component of the diagnostic evaluation of patients presenting with TIA to improve etiological assessment, therapeutic planning, and stroke prevention strategies.

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