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Imaging-Clinical Concordance and Hemiparesis in CT and MRI Assessment of Ischemic and Hemorrhagic Stroke: A Retrospective Dual-Site Study

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Abstract

Background

Computed tomography (CT) and magnetic resonance imaging (MRI) are cornerstone modalities in stroke neuroimaging. This study examined imaging–clinical concordance, with particular emphasis on hemiparesis, while considering CT and MRI within their different clinical roles.

Methods

This retrospective, dual-site study reviewed 200 brain imaging reports from a private and a government hospital in Faisalabad, Pakistan. Seventy-seven confirmed stroke cases (55 ischemic, 22 haemorrhagic) comprised the analytic sample, including 41 CT and 36 MRI examinations from separate, non-paired cohorts. Concordance was assessed using documented neurological symptoms, specifically hemiparesis and aphasia. Good concordance was defined as an imaging finding providing an anatomical explanation for the documented neurological deficit. Descriptive statistics and categorical comparisons were performed using chi-square and Fisher's exact tests in IBM SPSS Statistics version 26.

Results

Hemiparesis was present in 15/77 patients (19.5%) and was strongly associated with good imaging–clinical concordance (100% vs. 1.6%, $p < .001$). Hemiparesis occurred exclusively in ischemic stroke (27.3% vs. 0% in haemorrhagic stroke, $p = .006$). The only concordant case without hemiparesis had imaging findings corresponding to aphasia. MRI demonstrated significantly higher overall concordance than CT (30.6% vs. 12.2%, $p = .048$), while detection of hemiparesis did not differ significantly (27.8% vs. 12.2%, $p = .085$). Aphasia occurred in two patients; both demonstrated concordance and were considered exploratory.

Conclusion

Hemiparesis was the predominant clinical feature associated with imaging–clinical concordance. MRI showed higher observed concordance than CT. However, the non-paired retrospective design prevents conclusions regarding intrinsic modality superiority. CT and MRI should therefore be interpreted as complementary modalities in relation to clinical presentation.

Background

Stroke is a major global cause of death and disability, with a particularly high burden in low- and middle-income countries (1). It is broadly classified as ischemic or hemorrhagic, with ischemic stroke accounting for approximately 85% of cases and resulting from cerebral vessel occlusion, while

hemorrhagic stroke results from cerebral arterial rupture, with hypertension a major risk factor (2–4). Ischemic stroke remains a leading cause of long-term disability and death (5). Early differentiation between stroke types is essential for appropriate management, and diagnostic imaging plays a central role in establishing the diagnosis and guiding treatment (2).

Stroke manifestations vary according to lesion location, extent of neurological recovery, and premorbid status. Hemiparesis, defined as contralateral weakness affecting the face, arm, or leg, is among the most common neurological manifestations and provides an important clinical indicator for lesion localisation. The distribution of weakness can correspond to specific vascular territories; middle cerebral artery (MCA) lesions typically produce greater facial and upper-limb involvement, whereas anterior cerebral artery (ACA) lesions more prominently affect the contralateral leg. This relationship reflects the course and decussation of the corticospinal tracts, whereby a cerebral lesion produces contralateral motor weakness (6).

Aphasia is another clinically important manifestation, reflecting impairment of language function (7). Although it may occur alongside other neurological deficits, isolated aphasia without limb weakness is uncommon (7). Lesion-mapping studies have demonstrated that global aphasia without hemiparesis represents an unusual clinical-anatomical pattern (7). Such variability highlights the importance of interpreting neurological findings alongside imaging abnormalities when assessing imaging–clinical concordance.

Neuroimaging is integral to acute stroke management because it identifies the underlying pathology and differentiates ischemic from hemorrhagic stroke, enabling appropriate treatment decisions (8). Computed tomography (CT) and magnetic resonance imaging (MRI) are the principal modalities used in stroke evaluation (9). Non-contrast CT (NCCT) remains the most widely used initial imaging modality because of its rapid acquisition, accessibility, and suitability for emergency assessment (8, 9). Its primary role is the rapid detection or exclusion of intracranial hemorrhage, an essential consideration before thrombolytic treatment (3, 8, 10). However, CT has limited sensitivity for subtle or early ischemic changes, particularly during the first hours after symptom onset. Early ischemic abnormalities may be difficult to detect, while small cortical infarcts and posterior fossa lesions can be obscured by beam-hardening artefacts (3, 8).

MRI provides greater sensitivity and specificity for acute ischemic lesions but is less frequently used as the initial emergency modality because of longer acquisition times, higher costs, limited availability, and greater workflow complexity (8, 9). Diffusion-weighted imaging (DWI) is particularly valuable because it can demonstrate restricted water diffusion associated with cytotoxic oedema within minutes of vessel occlusion, with reported infarct detection sensitivity of up to 92% (8, 9). Other sequences, including susceptibility-weighted imaging (SWI), gradient-recalled echo (GRE), and fluid-attenuated inversion recovery (FLAIR), provide additional information regarding hemorrhage and infarct characteristics (8, 9).

CT and MRI are therefore increasingly regarded as complementary rather than competing modalities (11). CT offers speed and accessibility for hyperacute triage and rapid exclusion of hemorrhage, whereas

MRI provides greater sensitivity for acute ischemic changes and detailed assessment of small or posterior circulation lesions (3, 8, 10, 11). Modality selection depends on the clinical presentation, timing, institutional

workflow, and available resources (10, 12). CT is commonly preferred for initial emergency assessment, while MRI may provide additional diagnostic information when CT findings are inconclusive or more detailed lesion characterization is required (8, 11).

In this study, imaging–clinical concordance refers to agreement between a patient's documented neurological deficit and a corresponding anatomical abnormality identified on CT or MRI. Hemiparesis is particularly relevant because motor deficits can be anatomically correlated with lesions involving the corticospinal tract, while aphasia can indicate involvement of language-dominant cortical regions (7, 13). Although previous research has extensively compared the diagnostic performance of CT and MRI for stroke detection, less attention has been given to whether specific neurological manifestations are consistently associated with concordant imaging findings, particularly across different imaging modalities and healthcare settings (3, 8, 9).

This study was conducted across two tertiary hospitals in Faisalabad, Pakistan, representing different healthcare settings and resource availabilities. CT and MRI were performed in separate patient groups, providing a real-world assessment of imaging–clinical concordance. This retrospective study therefore investigated the association between hemiparesis and imaging–clinical concordance and examined the diagnostic contributions of CT and MRI in ischemic and hemorrhagic stroke. The study aimed to evaluate whether concordance differed between modalities while emphasizing their complementary roles in clinical stroke assessment rather than establishing one modality as categorically superior.

Methods

Study design

This retrospective observational study was conducted in the Radiology Departments of Faisal Hospital and Allied Hospital, Faisalabad, Pakistan. Faisal Hospital represented the private healthcare sector, whereas Allied Hospital represented the public sector. The study covered four months from February to May 2026. The study received ethical approval from the university and institutional permission from the respective hospital Radiology Departments. Given the retrospective nature of the study, no direct patient contact was involved.

Study Population

A cohort of 200 patients presenting with suspected neurological conditions who underwent brain CT or MRI at either hospital during the data collection period were retrospectively reviewed. Of these, 77 met criteria for confirmed stroke (55 ischemic, 22 hemorrhagic) and formed the primary analytic sample for

clinical concordance analyses and evaluating the diagnostic contributions of modality. The remaining 123 non-stroke cases were retained only to characterize the overall diagnostic caseload (Table 2). CT and MRI were not performed on the same patients; each patient was imaged by one modality based on clinical features, machine availability, and the condition of the patient, resulting in separate, non-paired cohorts for CT (n = 41) and MRI (n = 36) among the confirmed stroke cases.

Table 2
Frequency and percentage distribution of all diagnostic categories in the total study sample (n = 200)

Diagnosis Category	Frequency (n)	Percent (%)
Ischemic Stroke	55	27.5%
Hemorrhagic Stroke	22	11.0%
Brain Tumor	7	3.5%
Hydrocephalus	6	3.0%
Encephalitis	2	1.0%
Normal	88	44.0%
Other	20	10.0%
Total	**200**	**100.0%**

Inclusion Criteria

Adult patients over the age of 18 years who underwent brain CT or MRI at either participating hospital during the data collection period were included, provided the report contained a clearly documented radiological diagnosis and originated from Faisal Hospital or Allied Hospital, Faisalabad, within the prescribed time. Reports were required to provide sufficient information on neurological symptom status, such as hemiparesis, aphasia, altered mental state, or headache, and cases of ischemic or hemorrhagic stroke required radiological confirmation.

Exclusion Criteria

Patients under 18 years of age were excluded, as were incomplete, illegible, or missing radiology reports. Scans performed for trauma, post-operative assessment, or non-neurological problems were excluded. Non-stroke cases were excluded from the clinical concordance analyses and diagnostic contributions, though they were retained to characterize the overall diagnostic caseload (Table 2).

Imaging Equipment and Parameters

The two hospitals differed in imaging equipment, which may influence image quality and diagnostic certainty (Table 1). MRI examinations at both hospitals were performed using multisequential, multiplanar protocols incorporating T1-weighted (T1W), T2-weighted (T2W), FLAIR, and diffusion-weighted imaging (DWI); therefore, sequence selection did not differ between institutions. The principal differences were CT slice thickness (2 mm at Faisal Hospital vs. 5 mm at Allied Hospital) and MRI field strength (0.5 T at Faisal Hospital vs. 1.5 T at Allied Hospital).

Table 1
CT and MRI Imaging parameters at the two participating hospitals.

Parameter	Faisal Hospital (Private)	Allied Hospital (Government)
CT slice thickness	2 mm	5 mm
CT kVp / mAs	120 kVp / 200 mAs	120 kVp / 200 mAs
MRI field strength	0.5 Tesla	1.5 Tesla
MRI sequences	T1W, T2W, FLAIR, DWI	T1W, T2W, FLAIR, DWI

Data Collection Procedure

Radiological reports were retrospectively evaluated with the approval of the hospital administration and Radiology Department heads. No patients were contacted. Data were extracted using a structured data-extraction form covering four domains: demographic characteristics (age, gender, hospital); clinical characteristics (presenting symptoms, presence and laterality of hemiparesis, aphasia, and other documented neurological findings); imaging characteristics (modality and relevant technical parameters); and radiological findings, including stroke diagnosis, lesion location, side of involvement, and documented edema, mass effect etc.

Imaging-Clinical Concordance

Imaging–clinical concordance was assessed by determining whether the radiological finding documented on CT or MRI provided an anatomical explanation for the neurological deficit recorded at the time of imaging referral. Hemiparesis was considered concordant when the identified lesion was anatomically consistent with the documented side and pattern of motor weakness. Similarly, aphasia was considered concordant when the identified lesion corresponded anatomically and hemispherically with the documented language deficit. For each confirmed stroke case, the imaging findings were assessed for consistency with the documented clinical presentation, including lesion location and laterality. A case was classified as having good concordance when the imaging abnormality provided a reasonable anatomical explanation for the documented neurological deficit; concordance was classified as poor when no corresponding lesion was identified or when the lesion location or laterality was inconsistent with the clinical presentation.

Statistical Analysis

Data was analyzed using IBM SPSS Statistics Version 26.0. Continuous variables (age) are reported as mean ± standard deviation, and categorical variables are reported as frequencies and percentages. Categorical associations were assessed using the chi-square test, with Fisher's exact test applied where expected cell counts were below 5, and Phi coefficients calculated to express the strength of association for 2×2 tables. Because no independent gold standard (histopathology or long-term clinical follow-up) was available, sensitivity and specificity could not be calculated; diagnostic contributions are instead reported descriptively as detection proportions, and concordance is reported as agreement between imaging and clinical documentation. A p-value of < 0.05 was considered statistically significant.

Ethical Considerations

This study involved a retrospective review of radiology reports; no patient contact, clinical intervention, or biological sampling occurred, and no personally identifiable information was recorded. Formal ethical approval was obtained from the university, and written permission was secured from the Radiology Departments of both participating hospitals.

Results

Distribution of All Diagnostic Cases in the Total Sample (n = 200)

Table 2 presents the distribution of all 200 brain imaging reports collected across both hospitals during the study period, from which the 77 confirmed stroke cases were drawn (Table 2).

Clinical and Demographic Characteristics of Stroke Patients

Table 3 summarizes the demographic and clinical profile of the 77 confirmed stroke patients. The cohort had a mean age of 54.10 ± 17.29 years (range 19–85) and a modest male predominance (57.1%). Ischemic stroke accounted for 55 cases (71.4%) and hemorrhagic stroke for 22 cases (28.6%). Altered consciousness was the most common clinical feature overall (23.4%), while hemiparesis was the most common focal neurological deficit (19.5%, 15/77) (Table 3).

Table 3
Patient demographics and clinical profile of the confirmed stroke cohort (n = 77).

Variable	Value
Total confirmed stroke patients	77
Mean age (years)	54.10 ± 17.29
Male	44 (57.1%)
Female	33 (42.9%)
Ischemic stroke	55 (71.4%)
Hemorrhagic stroke	22 (28.6%)
Most common clinical feature	Altered consciousness (23.4%)
Most common focal neurological deficit	Hemiparesis (19.5%)

Clinical and radiological features in stroke patients

Altered consciousness (23.4%) was the most prevalent feature, followed by headache (20.8%) and hemiparesis (19.5%) (Fig. 1).

Modality and Stroke Subtype

MRI identified a higher proportion of ischemic strokes (29/36 MRI cases, 80.6%) than CT (26/41 CT cases, 63.4%), while CT identified a higher proportion of hemorrhagic strokes (15/41, 36.6%) than MRI (7/36, 19.4%) (Table 4). This difference did not reach statistical significance (p = .097).

Table 4
Crosstabulation: Imaging Modality vs Stroke Diagnosis Type (N = 77)

Modality	IschemicStroken (%)	Hemorrhagic Stroke n (%)	Total	Chi-sq p
CT	26 (63.4%)	15 (36.6%)	41	
MRI	29 (80.6%)	7 (19.4%)	36	
Total	55 (71.4%)	22 (28.6%)	77	.097

Imaging Modality and Clinical Concordance

MRI showed a significantly higher rate of good imaging-clinical concordance (11/36, 30.6%) than CT (5/41, 12.2%) (p = .048). This showed a statistically significant relationship between modality and concordance (Table 5).

Table 5

Crosstabulation: Imaging modality vs. clinical concordance (N = 77)

Modality	Good Concordancen (%)	Poor Concordancen (%)	Total	Chi-sq p
CT	5 (12.2%)	36(87.8%)	41	
MRI	11(30.6%)	25(69.4%)	36	
Total	16(20.8%)	61(79.2%)	77	.048

Hemiparesis and Clinical Concordance

Good clinical concordance was observed in all 15 patients with hemiparesis (100%), compared with only 1 of 62 patients without hemiparesis (1.6%) (Table 6). This association was highly statistically significant ($p < .001$), with a Phi coefficient of − 0.960 indicating a near-perfect relationship. The single non-hemiparesis patient who showed good concordance presented with aphasia as their documented neurological deficit; taken together, all 16 good-concordance cases in the entire cohort are accounted for by the presence of either hemiparesis or aphasia (Table 6). Because all 15 hemiparesis cases showed good concordance without exception, this held true within each modality subgroup as well: every hemiparesis case detected by either CT or MRI showed good concordance.

Table 6

Crosstabulation: Hemiparesis vs. clinical concordance (N = 77)

Hemiparesis	Good Concordancen (%)	Poor Concordance n (%)	Total	Chi-sq p
No	1 (1.6%)	61 (98.4%)	62	
Yes	15 (100.0%)	0 (0.0%)	15	
Total	16	61	77	*< .001*

Hemiparesis and Stroke Type

A statistically significant association was observed between stroke type and hemiparesis (Fisher's exact test, $p = .004$) (Table 7). Hemiparesis was present in 15 of 55 patients with ischemic stroke (27.3%) and in none of the 22 patients with hemorrhagic stroke (0.0%) (Table 7). Thus, within this study population, hemiparesis was observed exclusively among patients with ischemic stroke.

Table 7

Crosstabulation: Diagnosis Type vs Hemiparesis (N = 77)

Diagnosis	Hemiparesis:Non (%)	Hemiparesis: Yes n (%)	Total	p-value
Ischemic Stroke	40 (72.7%)	15 (27.3%)	55	.006
Hemorrhagic Stroke	22 (100.0%)	0 (0.0%)	22	
Total	62 (80.5%)	15 (19.5%)	77	—

Imaging Modality and Hemiparesis

The proportion of stroke cases associated with hemiparesis did not differ significantly between the two imaging groups: 10 of 36 MRI cases (27.8%) versus 5 of 41 CT cases (12.2%) had documented hemiparesis (p = .085) (Table 8). This finding does not establish equivalence between CT and MRI; rather, the observed difference did not reach statistical significance in this cohort. Notably, all 15 patients with hemiparesis demonstrated good imaging–clinical concordance, irrespective of imaging modality.

Table 8
Crosstabulation: Imaging Modality vs Hemiparesis (N = 77)

Modality	Hemiparesis:Non (%)	Hemiparesis: Yes n (%)	Total	p-value
CT	36 (87.8%)	5 (12.2%)	41	.085
MRI	26 (72.2%)	10 (27.8%)	36	
Total	62 (80.5%)	15 (19.5%)	77	—

Aphasia

Aphasia was documented in only 2 of 77 stroke patients (2.6%), both ischemic and both detected by MRI; both cases showed good clinical concordance. Given this small number, the finding is reported descriptively only and is not sufficient to support an independent statistical claim about modality performance for aphasia detection.

Lesion Territory Distribution

Lesion locations were grouped into anterior circulation, posterior circulation, mixed, and other/unspecified territories (Table 9). Anterior circulation lesions predominated on both CT (65.9%) and MRI (58.3%). Posterior circulation lesions were identified more frequently on MRI (5/36, 13.9%) than CT (2/41, 4.9%) (Table 9). All hemiparesis cases and both aphasia cases arose from anterior or mixed-territory lesions; no posterior-circulation-only lesion was associated with either deficit in this cohort.

Table 9
Vascular territory distribution by imaging modality, with associated hemiparesis and aphasia counts (N = 77).

Vascular Territory	CT n (%)	MRI n (%)	Hemiparesis n	Aphasia n
Anterior circulation	27 (65.9%)	21 (58.3%)	9	1
Posterior circulation	2 (4.9%)	5 (13.9%)	0	0
Mixed (ant. + post.)	8(19.4%)	6 (16.7%)	6	1
Other/unspecified	4 (9.8%)	4 (11.1%)	0	0
Total	**41**	**36**	**15**	**2**

Discussion

This retrospective study investigated the relationship between hemiparesis and imaging–clinical concordance and examined the diagnostic contributions of CT and MRI in ischemic and hemorrhagic stroke across two tertiary hospitals in Faisalabad, Pakistan. The principal finding was a near-perfect association between hemiparesis and imaging–clinical concordance (Phi = − .960, $p < .001$), irrespective of imaging modality. These findings support interpreting CT and MRI according to clinical presentation rather than treating them as universally competing modalities. The dual-site design, incorporating different imaging resources, including 0.5T and 1.5T MRI systems and differing CT protocols, also provides practical relevance to resource-variable clinical environments.

The strongest finding was that all 15 patients presenting with hemiparesis demonstrated good imaging–clinical concordance, compared with only 1.6% of patients without hemiparesis. This relationship is anatomically plausible because hemiparesis is a relatively well-localized manifestation of corticospinal tract involvement and can correspond to specific vascular territories (14). MCA lesions commonly produce greater facial and upper-limb weakness, whereas ACA lesions more prominently affect the contralateral leg (6). Previous studies similarly identify weakness or hemiplegia as common manifestations of ischemic stroke, reported in approximately 55–77% of cases (15). The relatively direct relationship between motor deficits and lesion location suggests that hemiparesis may provide a particularly useful clinical–radiological correlate. Consequently, where MRI availability is limited, a clear hemiparesis presentation combined with CT may still provide reliable anatomical concordance.

Importantly, the higher overall concordance observed with MRI should not be interpreted as evidence of intrinsic MRI superiority. All 16 concordant cases in the cohort were attributable to either hemiparesis or aphasia. Five of CT's concordant cases involved hemiparesis, whereas MRI had 11 concordant cases, including 10 associated with hemiparesis and one with aphasia alone. Hemiparesis was more frequent in the MRI group than the CT group (27.8% vs. 12.2%), although this difference was not statistically significant ($p = .085$). Given the near-perfect concordance associated with hemiparesis, the greater proportion of such presentations in the MRI group could substantially account for the observed difference in overall concordance (30.6% vs. 12.2%, $p = .048$). The non-paired design therefore prevents separation of modality effects from differences in patient composition.

Hemiparesis occurred exclusively among ischemic stroke cases (27.3% vs. 0% in hemorrhagic stroke; $p =$

.006). This finding should be interpreted cautiously because of the small hemorrhagic subgroup, and imaging remains essential for definitive stroke classification (15). Nevertheless, the pattern is broadly consistent with evidence that clinical manifestations differ between stroke types. Ojaghihaghighi et al[2] reported greater frequencies of headache, agitation, seizure, depressed consciousness, and pupillary dilation in hemorrhagic stroke, whereas progressive headache was more commonly associated with ischemic stroke (2). Clinical presentation may therefore contribute to early assessment, although it cannot replace imaging for establishing stroke type.

MRI-imaged patients also had a higher proportion of posterior circulation lesions than CT-imaged patients (13.9% vs. 4.9%), although the small subgroup numbers prevented statistical testing. This descriptive pattern is consistent with evidence that CT is less sensitive for posterior fossa and brainstem pathology because of beam-hardening artefacts and limitations in visualizing subtle lesions (3, 8, 10). No hemiparesis or aphasia cases in this cohort were confined exclusively to posterior circulation lesions. MRI also identified a numerically greater proportion of ischemic strokes, whereas CT identified more hemorrhagic strokes; however, this difference was not statistically significant ($p = .097$). These trends are directionally consistent with established differences in the diagnostic strengths of the two modalities (3, 10).

Aphasia provides a further, although exploratory, perspective. Both patients with aphasia demonstrated good imaging–clinical concordance, including one patient without hemiparesis. However, the subgroup was too small to support firm conclusions. Aphasia is also potentially more variable as a clinical–anatomical correlate because language organization differs between individuals (7).

The findings have practical implications for resource-variable stroke services. CT remains valuable for rapid initial assessment because of its speed, accessibility, and established role in excluding intracranial hemorrhage before thrombolysis (8, 10, 16, 17). Evidence also indicates that an initial CT-only strategy can achieve outcomes comparable with CT followed by additional MRI in selected settings (18). MRI nevertheless provides additional sensitivity for early ischemic lesions, particularly through DWI, which can demonstrate restricted diffusion within minutes of vessel occlusion (8). It may therefore be particularly useful when clinical localisation is less clear, CT findings are inconclusive, or posterior circulation pathology is suspected. MRI can also be implemented as a first-line strategy in appropriately equipped stroke centers, although workflow considerations remain relevant (19).

Overall, the findings support a complementary approach to CT and MRI. For patients with a clearly localized deficit such as hemiparesis, CT may provide clinically meaningful concordance comparable to MRI, while MRI offers additional value when clinical localisation is less defined or subtle ischemic pathology is suspected. This approach may be particularly relevant in resource-constrained settings.

Conclusion

Hemiparesis was the predominant clinical feature associated with imaging–clinical concordance, demonstrating a near-perfect association irrespective of whether CT or MRI was used. Although MRI showed a higher observed proportion of concordant examinations than CT, this difference may reflect the greater proportion of patients with hemiparesis in the MRI group rather than a modality-specific advantage. These findings support interpreting CT and MRI according to clinical presentation. For patients with well-localized deficits such as hemiparesis, CT may provide comparable imaging–clinical

concordance, while MRI may offer additional value when clinical localisation is less clear or subtle ischemic pathology is suspected. A complementary approach to CT and MRI is therefore supported, particularly in resource-constrained settings.

Abbreviations

CT
Computed Tomography
MRI
Magnetic Resonance Imaging
MCA
Middle Cerebral Artery
ACA
Anterior Cerebral Artery
NCCT
Non-contrast CT
DWI
Diffusion-weighted Imaging
SWI
Susceptibility-weighted Imaging
GRE
Gradient-recalled Echo
FLAIR
Fluid-attenuated Inversion Recovery

Declarations

Ethics approval and consent to participate

Ethical approval for this study was obtained from Government College University, Faisalabad INSTITUTIONAL REVIEW BOARD (APPROVAL NUMBER GCUF/AHP/25/139). The study was conducted in compliance with the ethical principles and accordance of the Declaration of Helsinki and its later amendments. Written informed consent for participation was obtained from all participants.

Consent for publication

Written informed consent was obtained for anonymized patient information to be published in this article.

Competing interests

The authors declare that they have no competing interests.

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Author Contribution

MR: Conceptualisation, Investigation, Methodology, Formal analysis, Writing-Original draft preparation. FB: Visualisation, Formal analysis, Writing-Reviewing and Editing. MR: Visualisation, Formal analysis, Writing-Reviewing and Editing.AA: Methodology, Formal analysis, Writing-Reviewing and Editing, Supervision, Validation.AR: Methodology, Formal analysis, Review, Writing-Reviewing and Editing, Project administration, Supervision.

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Availability of data

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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Figures

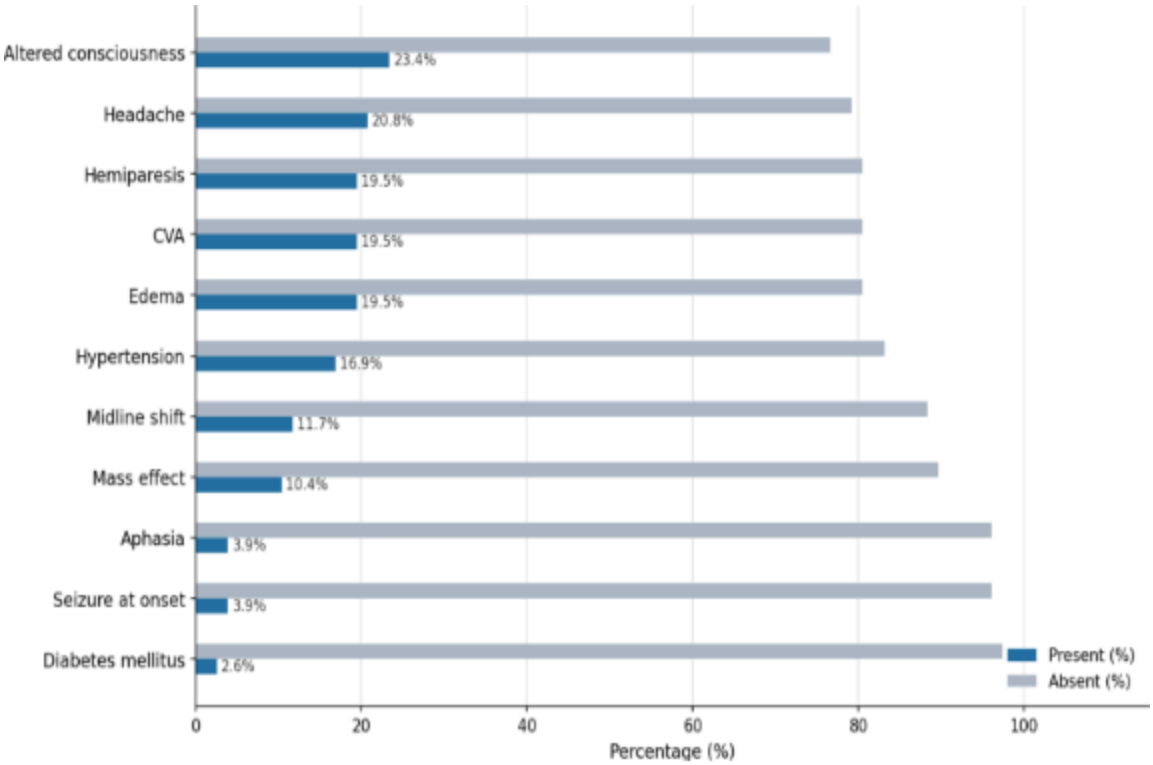


Figure 1

Prevalence of clinical and radiological features in confirmed stroke patients (n = 77), sorted by frequency.