Aims: We aimed to validate the predictive value of the ABCD3-I score for short-term and long-term stroke risk after transient ischemic attack (TIA) and to evaluate the influence of symptomatic intracranial artery stenosis (sICAS) on the performance of ABCD3-I.

Methods: We recruited TIA patients from the Third China National Stroke Registry study. Outcome parameters were stroke events during the 14-day, 3-month, 6-month, and 12-month points. The area under the curve (AUC) was calculated as a measure of predictive ability. A multivariable-adjusted Cox proportional hazards model was used to assess the hazard ratio of risk factors for stroke.

Results: Among 986 patients, 3.9%, 5.1%, 6.5%, and 8.2% of participants experienced a stroke event during the 14-day, 3-month, 6-month, and 12-month points post TIA, respectively. The AUCs of ABCD3-I score for the prediction of stroke were 0.786, 0.732, 0.715, and 0.699 at the 14-day, 3-month, 6-month, and 12-month points, respectively. The AUCs were 0.774, 0.690, 0.617, and 0.611 in patients with sICAS, 0.789, 0.748, and 0.758 and 0.734 in those without sICAS. P values of the interaction between ABCD3-I categories and sICAS were 0.0618 for 14-day, 0.0098 for 3-month, 0.0318 for 6-month, and 0.0294 for 12-month.

Conclusions: ABCD3-I score performed well in predicting short-term risk of a stroke after an index TIA in patients with or without sICAS. However, the predictive power decayed with the prolonged period, and the decayed extent was more pronounced among those with sICAS. The assessment of sICAS is a non-ignorable item when using the ABCD3-I score for long-term stroke risk prediction in patients with TIA.

Key words: Transient ischemic attack, Intracranial artery stenosis, Risk prediction, ABCD3-I, Stroke incidence
identifiable at the time of initial and does not fulfill the purpose of guiding risk-based treatment decisions after a stroke specialist assessment. In order to improve the prediction value of the ABCD2 score, a imaging-based score- ABCD3-I score was established with a better predictive performance, and it was validated by several studies. The 13-points ABCD3-I score is calculated by evaluating medical records as follows: age, blood pressure, clinical features, duration of symptoms, diabetes, and dual TIA, as well as imaging criteria including ipsilateral ≥ 50% ICA stenosis and an acute brain lesion.

Although the ABCD3-I score exhibits an excellent predictive value for short-term stroke recurrence in patients with TIA, two other important issues remain to be clarified. First, monitoring high long-term risk of cardiovascular in patients with TIA would be necessary. However, few studies analyzed performance of ABCD3-I at long-term stroke risk prediction after TIA. Whether ABCD3-I score exhibits the same excellent predictive value for long-term stroke risk as short-term in patients with TIA is unclear. Second, intracranial atherosclerosis is associated with a high risk of stroke event in patients with TIA. Unlike carotid atherosclerosis that is the most common cause for large vessel occlusion in Caucasians, intracranial stenosis (ICAS) is more prevalent in Asians, Hispanics, and African-Americans. The presence of stenosis of extracranial carotid was included in the ABCD3-I score as an imaging parameter, but assessments of intracranial findings are not incorporated. Whether symptomatic intracranial stenosis (sICAS) affects the predictive value of ABCD3-I score is unknown, especially in the Asian population.

Based on a hospital based study, The Third China National Stroke Registry (CNSR-III), we aimed to validate the predictive value of the ABCD3-I score to predict short-term and long-term stroke risk after TIA and to evaluate the influence of sICAS on the performance of ABCD3-I score.

Methods

Study Participants

The CNSR-III is a nationwide prospective registry for patients presented to hospitals with acute ischemic cerebrovascular events. From August 2015 to March 2018, 15,166 stroke patients with a primary diagnosis of ischemic stroke or TIA within 7 days after symptom onset were enrolled from 201 participating hospitals. In CNSR-III, TIA was primary diagnosed according to time-based definitions on admission (acute onset of neurologic deficit ≤ 24 h as TIA, after assessment by stroke specialists on admission).

In the present study, 986 patients with a definite TIA were analyzed. The study was approved by the central institutional review board at Beijing Tiantan Hospital.

Data Collection

The baseline data were collected after admission through face-to-face interviews by neurologists at participating hospitals, following a standard data collection protocol developed by the steering committee. Pre-hospital care information, pre-stroke modified Rankin scale (mRS) score, in-hospital variables including demographics, medical history, ABCD2 score, family history, previous medication, physical examination, primary diagnosis, laboratory tests, and risk factor assessment were collected at baseline. Risk factors included history of stroke or TIA, hypertension, diabetes, dyslipidemia, atrial fibrillation, heart disease, and previous or current smoking. Next, height and weight were measured with participants wearing a scrub suit and no shoes, and then, body-mass index was calculated by dividing weight in kilograms by the square of height in meters. Hypertension was defined as systolic blood pressure ≥ 140 mmHg, diastolic blood pressure ≥ 90 mmHg, any use of antihypertensive drug continuously for more than 2 weeks before index cerebrovascular diseases, or self-reported history of hypertension. Dyslipidemia was defined as serum triglyceride ≥ 150 mg/dL, low-density lipoprotein cholesterol ≥ 130 mg/dL, high-density lipoprotein cholesterol ≤ 40 mg/dL, any use of lipid-lowering drugs, or any self-reported history of dyslipidemia. Diabetes mellitus was defined as fasting glucose level ≥ 7.0 mmol/L (126 mg/dL), the nonfasting glucose concentration ≥ 11.1 mmol/L (200 mg/dL) with classic symptoms of hyperglycemia or hyperglycemic crisis, any use of glucose-lowering drugs, or any self-reported history of diabetes mellitus. Atrial fibrillation was diagnosed based on electrocardiographic findings on admission or during hospitalization or a previous history of atrial fibrillation. ABCD3-I score range from 0 to 13, with higher scores indicating a greater risk of stroke; an age of 60 years or older, a blood-pressure level of 140/90 mm Hg or higher, a clinical feature with unilateral weakness or speech impairment, a duration of symptoms of 10 to 59 minutes, and diabetes are each assigned 1 point; and a duration of symptoms of 60 minutes or more, dual TIA in the preceding 7 days, ipsilateral ≥ 50% stenosis of internal carotid artery, acute diffusion-weighted imaging hyperintensity are assigned 2 points. Then, dual TIA was defined as the occurrence of ≥ 2 TIAs (i.e., the index TIA and one other TIA) within 7 days. The ABCD3-I scores were
compared by using a Cox proportional hazards model. The hazard ratios (HRs) and their 95% confidence intervals (CIs) for the development of stroke at 14-day, 3-month, 6-month, and 12-month after TIA were estimated by using a multivariable-adjusted Cox proportional hazards model. Next, interactions between ABCD3-I categories and sICAS were checked. A two-tailed P value < 0.05 was considered to be statistically significant. All analysis was conducted with SAS version 9.4 software (SAS Institute).

Data Availability
Anonymized data will be shared by request from any qualified investigator.

Results

Study Participants and Characteristics
Of 15,166 patients participated in CNSR-III, 1,184 presented with a TIA. A total of 986 patients were included into the current study after excluding 198 with missing information on ABCD3-I items or intracranial artery imaging assessment (Fig.1). Supplemental Table 1 showed the baseline characteristics of TIA patients included and excluded in this study. Excluded patients were slightly older, more likely to exhibit a shorter time from event to enrolment, more likely to take antiplatelet agent and clopidogrel with aspirin at discharge, and less likely to present with a medical history of diabetes. The demographic and clinical characteristics of included patients with and without sICAS was present in Table 1. The mean (IQR) age was 62.0 (53.0–70.0) years, and 646 patients (65.5%) were men. Patients with sICAS were older, more likely to present with a history of hypertension, diabetes, stroke, and TIA, and less likely to be smoker or drinker. Other demographic and clinical characteristics of patients can be found in Table 1.

Short- and Long-Term Incidence of Stroke
As shown in Fig. 2, the incidence of stroke was 3.9%, 5.1%, 6.5% and 8.2% at 14-day, 3-month, 6-month, and 12-month after TIA. The rate of stroke event was 4.3%, 7.0%, 9.7% and 10.2% in patients with sICAS, while 3.7%, 4.4%, 5.4%, and 7.3% in patients without sICAS at four follow-up time point. A higher rate of stroke was observed in patients with sICAS. As compared to patients without sICAS, a steeper increase in stroke incidence as follow-up time longed. When stratified by the ABCD3-I score, the stroke incidence was higher in the high-risk group than in the low-risk group (2.9%, 3.4%, 5.1%, and 6.9% in low-risk group, 4.5%, 7.5%, 10.7%, and 13.1% in moderate-risk group, and 6.1%, 8.9%, 12.2%, and 13.9% in high-risk group). Although the absolute event rate of stroke in patients with sICAS was higher than in patients without sICAS, the HRs for the development of stroke were not significantly different between the two groups (P = 0.09, 0.59, 0.24, and 0.02 for 14-day, 3-month, 6-month, and 12-month after TIA, respectively).

Statistical Analysis
Participant demographics and characteristics were analyzed using descriptive statistics. Continuous variables were presented in medians (interquartile ranges) and compared between groups using the nonparametric Wilcoxon test. Categorical variables were presented as percentages and tested by the chi-square test. The incidence of stroke after TIA was analyzed as ordinal variables and classified into low-, moderate-, and high-risk categories (0–3, 4–7, and 8–13).

Neuroimaging Findings
All patients received standard imaging exams during hospitalization, including brain MR imaging (MRI) with DWI (3.0T or 1.5T), intracranial artery imaging (TOF-MRA, CT angiography or digital subtraction angiography), and extracranial artery imaging (carotid ultrasound, CT/MR angiography or digital subtraction angiography). All image data were collected and analyzed centrally at TianTian Neuroimaging Center of Excellence (T-NICE), Beijing Tiantan Hospital. DWI findings on MRI on admission or during hospitalization were considered abnormal if there was ≥ 1 hyperintense area consistent with the presence of an infarcted lesion. Presence of sICAS and symptomatic extracranial arterial stenosis (sECAS) was defined as 50%–99% stenosis or occlusion of any intra- and extracranial artery, which was responsible for the acute infarction lesion and neurological symptoms, and respectively by the Warfarin-Aspirin Symptomatic Intracranial Disease trial (WASID)31) and the North American Symptomatic Carotid Endarterectomy Trial criteria32). The intracranial artery included bilateral intracranial internal carotid artery, anterior cerebral artery A1/A2, middle cerebral artery M1/M2, bilateral intracranial vertebral artery, posterior cerebral artery P1/P2, and basilar artery, while the extracranial artery included the extracranial internal carotid artery and bilateral extracranial vertebral artery.

Outcome Assessment
The main outcome of this study was a stroke after TIA at the 14-day, 3-month, 6-month, and 12-month points. A stroke event included an ischemic or hemorrhagic stroke. Ischemic stroke was defined as new onset of focal neurological deficit that cannot be attributed to the presenting lesion and is confirmed with radiographic (CT and/or MRI) evidence. Hemorrhagic stroke was defined as new onset of focal neurological deficit and radiographic (CT and/or MRI) findings showing hemorrhagic signs.

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Statistical Analysis
Participant demographics and characteristics were analyzed using descriptive statistics. Continuous variables were presented in medians (interquartile ranges) and compared between groups using the nonparametric Wilcoxon test. Categorical variables were presented as percentages and tested by the chi-square test. The incidence of stroke after TIA was compared by using a Cox proportional hazards model. The hazard ratios (HRs) and their 95% confidence intervals (CIs) for the development of stroke at 14-day, 3-month, 6-month, and 12-month after TIA were estimated by using a multivariable-adjusted Cox proportional hazards model. Next, interactions between ABCD3-I categories and sICAS were checked. A two-tailed P value < 0.05 was considered to be statistically significant. All analysis was conducted with SAS version 9.4 software (SAS Institute).

Data Availability
Anonymized data will be shared by request from any qualified investigator.
Table 3 presents odds ratios with 95% CI of high-, moderate-, versus low-risk category of ABCD3-I for stroke risk in patients stratified by the presence of sICAS. In patients with sICAS, compared to low-risk category, no significant predictive effect was found for stroke risk at all time points for moderate-risk category.

Discussion

Our data confirmed that the ABCD3-I score performed well in predicting short-term risk of stroke after an index TIA with or without sICAS. However, the predictive power of the ABCD3-I score decayed with the prolonged follow-up period and the decayed extent was more pronounced among those with sICAS.

The results of the present study indicate that early and late stroke risk after TIA in this population was similar to the previous study. In our study, we found a reliable predictive utility of the ABCD3-I score for short-term stroke risk (within 14-day) in TIA patients. The performance of ABCD3-I in predicting early stroke risk after TIA was good (0.786 for 14-day and 0.732 for 3 months), consistent with some other studies in which the AUCs fluctuated between 0.70-
Table 1. Demographic and clinical characteristics

|                              | Total n = 986 | With ICAS n = 259 | Without ICAS n = 727 | P value |
|------------------------------|---------------|-------------------|----------------------|---------|
| Median age (IQR) — yr        | 62.0 (53.0–70.0) | 65.0 (56.0–72.0)  | 61.0 (52.0–68.0)     |         |
| Male sex- no. (%)            | 646 (65.5)    | 172 (66.4)        | 474 (65.2)           | 0.73    |
| Median days event to enrolment (IQR) | 1.0 (1.0–3.0) | 1.0 (1.0–3.0)    | 1.0 (1.0–3.0)        | 0.4     |
| ABCD3-I                      | < 0.001       |                   |                      |         |
| 0 to 3                       | 313 (31.7)    | 53 (20.5)         | 260 (35.8)           |         |
| 4 to 7                       | 616 (62.5)    | 189 (73.0)        | 427 (58.7)           |         |
| 8 to 13                      | 57 (5.8)      | 17 (6.6)          | 40 (5.5)             |         |
| Medical history - no. (%)    |               |                   |                      |         |
| Hypertension                 | 570 (57.8)    | 176 (68.0)        | 394 (54.2)           | < 0.001 |
| Diabetes                     | 173 (17.5)    | 54 (20.8)         | 119 (16.4)           | 0.1     |
| Dyslipidemia                 | 117 (11.9)    | 27 (10.4)         | 90 (12.4)            | 0.4     |
| Current smoker               | 267 (27.1)    | 63 (24.3)         | 204 (28.1)           | 0.25    |
| Current drinker              | 141 (14.3)    | 30 (11.6)         | 111 (15.3)           | 0.15    |
| Stroke                       | 197 (20.0)    | 70 (27.0)         | 127 (17.5)           | 0.001   |
| TIA                          | 116 (11.8)    | 38 (14.7)         | 78 (10.7)            | 0.09    |
| Coronary artery disease      | 118 (12.0)    | 39 (15.1)         | 79 (10.9)            | 0.07    |
| Heart failure                | 2 (0.2)       | 1 (0.4)           | 1 (0.1)              | 0.46    |
| Atrial fibrillation          | 46 (4.7)      | 15 (5.8)          | 31 (4.3)             | 0.32    |
| Peripheral artery disease    | 13 (1.3)      | 4 (1.5)           | 9 (1.2)              | 0.75    |
| Modified Rankin score before admission - no. (%) |                   |               |                      | 0.16    |
| 0                            | 805 (81.6)    | 203 (78.4)        | 602 (82.8)           |         |
| 1                            | 153 (15.5)    | 47 (18.1)         | 106 (14.6)           |         |
| Body-mass index (IQR)        | 24.6 (22.9–26.7) | 24.8 (22.5–26.9) | 24.6 (22.9–26.7)     | 0.82    |
| Blood pressure - mm Hg       |               |                   |                      |         |
| Systolic                     | 142.0 (130.0–157.5) | 145.0 (130.0–160.0) | 141.0 (130.0–156.0) | 0.05    |
| Diastolic                    | 83.5 (77.5–91.5) | 82.5 (76.5–91.0)  | 84.0 (78.0–92.0)     | 0.12    |
| Medication use at discharge - no. (%) |                   |               |                      |         |
| Antiplatelet agent           | 875 (88.7)    | 236 (91.1)        | 639 (87.9)           | 0.16    |
| Lipid-lowering agent         | 869 (88.1)    | 240 (92.7)        | 629 (86.5)           | 0.009   |
| Anticoagulant agent          | 26 (2.6)      | 8 (3.1)           | 18 (2.5)             | 0.6     |
| Antihypertensive agent       | 432 (43.8)    | 130 (50.2)        | 302 (41.5)           | 0.02    |

sICAS indicates symptomatic intracranial stenosis and TIA, transient ischemic attack.

Fig. 2. Stroke incidence after transient ischemic attack (TIA)
with sICAS exhibit an extremely high risk of subsequent ischemic cerebrovascular events in both Eastern and Western populations\(^{35, 36}\). A major reason for the inconsistencies predictive value of ABCD3-I score between different periods is that patients with sICAS may exhibit more unstable vessel plaques, which leads to a high risk of stroke event within short-term follow-up. Previous studies showed that as the 

| Stroke Incidence | AUC value                  |                          |                          |
|------------------|---------------------------|--------------------------|--------------------------|
|                  | Total                     | sICAS                    | sICAS free               |
| 14-Day           | 0.786 (0.718, 0.855)       | 0.774 (0.614, 0.933)      | 0.789 (0.710, 0.868)     |
| 3-Month          | 0.732 (0.658, 0.807)       | 0.690 (0.537, 0.844)      | 0.748 (0.663, 0.833)     |
| 6-Month          | 0.715 (0.649, 0.781)       | 0.617 (0.488, 0.747)      | 0.758 (0.684, 0.833)     |
| 12-Month         | 0.699 (0.640, 0.758)       | 0.611 (0.489, 0.732)      | 0.734 (0.669, 0.799)     |

AUC indicates area under the curve and sICAS, symptomatic intracranial stenosis.

0.76\(^{16-18}\). In contrast, the predictive ability of the score for long-term stroke risk was limited. Also, another study reported the ability of the ABCD3-I in prediction of 13-year stroke risk after TIA was relatively low, with an AUC value of 0.61\(^{19}\).

In addition, the predictive performance of ABCD3-I for late stroke risk could be influenced by the presence of sICAS. It is well known that patients...
number of risk factors increases, stroke risks increase in patients with sICAS. In our study, patients with sICAS and more risk factors (ABCD3-I score 8–13) exhibited a higher risk of stroke when compared with low-risk factors (ABCD3-I score 0–7), and the stroke events were mostly occurred within 3 months. These may lead to the sharp AUC decay over time in patients with sICAS after TIA.

In the present study, we found a potential interaction between ABCD3-I score and the presence of sICAS for stroke recurrence after 3 months, suggesting that the association between ABCD3-I score and stroke risk were modified by sICAS. Most studies indicated Caucasians exhibited a relatively low incidence of ICAS. However, the prevalence of intracranial stenosis in Caucasians may have been underestimated. A recent UK cohort study reported that about 18% of individuals presented with 50–99% symptomatic or asymptomatic intracranial stenosis ICAS in patients with TIA or minor stroke. In addition, it has been proposed that patients with ipsilateral atherosclerotic stenosis >50% (including intracranial artery) could play as an important supplementary item for screening out high risk TIA. Like extracranial internal carotid artery stenosis screening, it should be emphasized for the utility of routine intracranial stenosis screening after TIA for secondary prevention. Furthermore, considering the inconsistent performance of ABCD3-I score in the two populations, sICAS should be taken into account for long-term stroke risk prediction in patients with TIA.

Although this is a nationwide registration study, some limitations in this study also cannot be avoided. First, 2,154 (14%) patients without a baseline MRI examination in CNSR-III were excluded. However, the baseline characteristics were similar between patients with and without MRI in CNSR-III (Supplemental Table 2). Furthermore, the CNSR-III was conducted exclusively among Chinese patients in whom a high proportion of ICAS exists. Thus, whether the results of this study can generalize to other non-Asia populations and require further validation in other ethnicities remains unknown. Finally, we only reported the results of 1-year follow-up, for the study has not completed the follow-up beyond the 1-year point, and 5-year follow-up results will be released in the future.

Conclusion

ABCD3-I score performs well in predicting short-term risk of stroke after an index TIA with or without sICAS. However, the predictive power of the ABCD3-I decayed over time, and the decayed is more pronounced among TIA with sICAS. The item sICAS should not be ignored when using the ABCD3-I score for long-term stroke risk prediction in patients with TIA.

Contributors

Yongjun Wang designed the study. Xuewei Xie and Jing Jing interpreted analysis of the data and prepared the report. Zixiao Li, Yilong Wang, Yuesong Pan, Pan Chen, Liping Liu, Yong Jiang, and Hao Li contributed to comments on the draft manuscript and revised the report. Xia Meng coordinated the study and revised the report. Aoming Jin conducted the statistical analysis.

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Conflict of Interest

The authors declare no financial or other competing interests relevant to the manuscript.

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### Supplemental Table 1. Demographic and clinical characteristics

|                           | Inclusion n = 986 | Exclusion n = 198 | P value |
|---------------------------|-------------------|-------------------|---------|
| Median age (IQR) — yr     | 62.0 (53.0-70.0)  | 65.0 (56.0-72.0)  | 0.01    |
| Male sex - no. (%)        | 646 (65.5)        | 172 (66.4)        | 0.52    |
| Median days from event to enrolment (IQR) | 1.0 (1.0-3.0) | 2.0 (1.0-4.0) | 0.03 |
| Medical history - no. (%) |                   |                   |         |
| Hypertension              | 570 (57.8)        | 118 (59.6)        | 0.64    |
| Diabetes                  | 173 (17.5)        | 53 (26.8)         | 0.003   |
| Dyslipidemia              | 117 (11.9)        | 19 (9.6)          | 0.36    |
| Current smoker            | 267 (27.1)        | 56 (28.3)         | 0.73    |
| Current drinker           | 141 (14.3)        | 26 (13.1)         | 0.67    |
| Stroke                    | 197 (20.0)        | 35 (17.7)         | 0.46    |
| TIA                       | 116 (11.8)        | 15 (7.6)          | 0.09    |
| Coronary artery disease   | 118 (12.0)        | 24 (12.1)         | 0.95    |
| Heart failure             | 2 (0.2)           | 0 (0.0)           | 0.53    |
| Atrial fibrillation       | 46 (4.7)          | 7 (3.5)           | 0.48    |
| Peripheral artery disease | 13 (1.3)          | 2 (1.0)           | 0.72    |
| Modified Rankin score     |                   |                   | 0.54    |
| before admission - no. (%)|                   |                   |         |
| 0                         | 805 (81.6)        | 168 (84.8)        |         |
| 1                         | 153 (15.5)        | 25 (12.6)         |         |
| Body-mass index (IQR)     | 24.6 (22.9-26.7)  | 24.8 (23.4-26.6)  | 0.49    |
| Blood pressure - mm Hg    |                   |                   |         |
| Systolic                  | 142.0 (130.0-157.5)| 140.0 (130.0-157.5)| 0.37    |
| Diastolic                 | 83.5 (77.5-91.5)  | 81.0 (77.0-90.0)  | 0.35    |
| Medication use at discharge - no. (%) |           |                   |         |
| Antiplatelet agent        | 875 (88.7)        | 165 (83.3)        | 0.03    |
| Lipid-lowering agent      | 869 (88.1)        | 167 (84.3)        | 0.14    |
| Anticoagulant agent       | 26 (2.6)          | 2 (1.0)           | 0.17    |
| Antihypertensive agent    | 432 (43.8)        | 81 (40.9)         | 0.45    |

sICAS indicates symptomatic intracranial stenosis and TIA, transient ischemic attack.
## Supplemental Table 2. Baseline characteristics of patients with and without MRI exam in CNSR-III

| Characteristics                              | With MRI (N=13,012) | Without MRI (N=2,154) | P Value |
|----------------------------------------------|---------------------|------------------------|---------|
| Age - year                                   | 62.3 ± 11.2         | 61.6 ± 11.8            | 0.01    |
| Male sex - no. (%)                           | 8890 (68.3)         | 1474 (68.4)            | 0.92    |
| Interval from onset to enrolment - day       | 2.3 ± 2.0           | 2.4 ± 2.5              | 0.56    |
| ABCD2 (for TIA patients)                     | 4.2 ± 1.3           | 3.1 ± 1.8              | <0.001  |
| NIHSS (for MIS patients)                     | 4.2 ± 4.1           | 4.3 ± 4.6              | 0.50    |
| Medical history - no. (%)                    |                     |                        |         |
| Hypertension                                 | 8167 (62.8)         | 1327 (61.6)            | 0.30    |
| Diabetes                                     | 2964 (22.8)         | 546 (25.3)             | 0.009   |
| Dyslipidemia                                 | 1024 (7.9)          | 167 (7.8)              | 0.85    |
| Current smoker                               | 4097 (31.5)         | 655 (30.4)             | 0.32    |
| Current drinker                              | 1827 (14.0)         | 299 (13.9)             | 0.84    |
| Stroke                                       | 2850 (21.9)         | 505 (23.4)             | 0.11    |
| TIA                                          | 355 (2.7)           | 61 (2.8)               | 0.78    |
| Coronary artery disease                      | 1315 (10.1)         | 293 (13.6)             | <0.001  |
| Heart failure                                | 80 (4.6)            | 14 (3.6)               | 0.40    |
| Atrial fibrillation                          | 866 (6.6)           | 163 (7.6)              | 0.09    |
| Peripheral artery disease                    | 98 (0.8)            | 20 (0.9)               | 0.39    |
| mRS before admission - no. (%)               |                     |                        | 0.81    |
| 0                                            | 9647 (74.1)         | 1600 (74.3)            |         |
| 1                                            | 2224 (17.1)         | 304 (16.3)             |         |
| Body-mass index                              | 24.7 ± 3.4          | 24.7 ± 3.2             | 0.82    |
| Blood pressure - mm Hg                       |                     |                        |         |
| Systolic                                     | 150.2 ± 22.1        | 149.5 ± 22.0           | 0.09    |
| Diastolic                                     | 87.4 ± 13.1         | 87.0 ± 13.1            | 0.15    |
| TOAST classification - no. (%)               |                     |                        | <0.001  |
| Large-artery atherosclerosis                 | 3431 (26.4)         | 425 (19.7)             |         |
| Small-artery occlusion                       | 2968 (22.8)         | 197 (9.1)              |         |
| Cardioembolism                               | 768 (5.9)           | 149 (6.9)              |         |
| Other determined etiology                    | 174 (1.3)           | 8 (0.4)                |         |
| Undetermined etiology                        | 5671 (43.6)         | 1375 (63.8)            |         |
| Medication use at discharge - no. (%)        |                     |                        |         |
| Antiplatelet agent                           | 11818 (91.0)        | 1893 (88.4)            | <0.001  |
| Lipid-lowering agent                         | 11908 (91.7)        | 1923 (89.8)            | 0.005   |
| Anticoagulant agent                          | 362 (2.8)           | 87 (4.1)               | 0.001   |
| Antihypertensive agent                       | 6383 (49.1)         | 1035 (48.3)            | 0.49    |

MRI, Magnetic Resonance Imaging; DWI, Diffusion-Weighted Imaging; TIA, transient ischemic attack; MIS, minor ischemic stroke; BMI, body mass index (calculated as weight in kilograms divided by height in meters squared); NIHSS, National Institute of Health Stroke Scale; TOAST classification: The Trial of Org 10172 in Acute Stroke Treatment classification indicates the probable cause of the index TIA/MIS, including five categories, large-artery atherosclerosis, cardioembolism, small-vessel occlusion, other determined cause, and undetermined cause; ABCD2, a score (0-7 points) to predict stroke risk following a TIA, including age ≥ 60 years (1 point), blood pressure ≥ 140/90 mm Hg (1 point), symptoms of unilateral weakness or speech impairment (1-2 points), duration of symptoms of < 10 to 59 minutes or ≥ 60 minutes (1-2 points), and diabetes (1 point).

*Values are expressed as means ± SD or number (%).