MR CLEAN

MR CLEAN Registry
A Multicenter Clinical Registry of Endovascular treatment for Acute Ischemic stroke in the Netherlands

Associations of clinical and imaging characteristics with collateral grade on baseline CT angiography in patients with acute ischemic stroke due to large vessel occlusion

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BACKGROUND

Poor cerebral collateral circulation is associated with poor functional outcome after ischemic stroke and reduces the beneficial effect of endovascular treatment.

AIM

We aimed to identify **clinical and imaging characteristics that are associated with collateral grade on baseline CTA** in patients with acute ischemic stroke due to a proximal intracranial occlusion in the anterior circulation.

METHODS

- Data from the MR CLEAN trial (n=500) and the MR CLEAN Registry (n=1488), total n=1988
- CTA collateral grade was scored on a 4-point scale (Panel)
- Univariable and multivariable ordinal logistic regression analysis to assess the association between CTA collateral grade and characteristics previously suggested in the literature
- Characteristics with P<0.157 in univariable analysis were included in the final multivariable regression model

RESULTS

Table 1. Clinical and imaging characteristics at baseline.

Age – median (IQR)	69 (58 – 79)
Male sex – n. (%)	1086 (55)
NIHSS – median (IQR)	16 (12 – 20)
Systolic blood pressure – mean mmHg (SD)	149 (24)
Diastolic blood pressure – mean mmHg (SD)	82 (15)
History of hypertension – n. (%)	972 (49)
History of diabetes mellitus – n. (%)	323 (16)
History of myocardial infarction – n. (%)	302 (15)
History of ischemic stroke – n. (%)	303 (15)
Use of statins – n. (%)	665 (34)
Use of antiplatelets – n. (%)	637 (32)
ICA-(T) occlusion – n. (%)	533 (28)

Table 2. Collateral grades on baseline CTA.

Grade 0	n=123	7%
Grade 1	n=596	32%
Grade 2	n=734	39%
Grade 3	n=422	23%

Table 3. Associations of various characteristics with baseline CTA collateral grade. Adjusted common odds ratios <1 represent associations with poorer collateral grades.

Characteristic	Adjusted common OR	P-value
Age (per 10 years)	**0.88 (0.83 - 0.94)**	**<0.001**
Male sex	**0.71 (0.58 - 0.80)**	**<0.001**
History of ischemic stroke	0.83 (0.71 - 1.15)	0.12
Baseline diastolic blood pressure (per 10 mmHg)	**0.94 (0.90 – 1.00)**	**0.03**
Use of statins	0.90 (0.74 - 1.09)	0.28
Use of antiplatelets	0.85 (0.70 – 1.04)	0.11
ICA-(T) occlusion	**0.58 (0.49 – 0.70)**	**<0.001**

CONCLUSIONS

- **Older age, male sex, higher baseline diastolic blood pressure, and occlusion of the ICA-(T)** are associated with **poorer** CTA collateral grades.
- No independent association was found with cerebrovascular risk factors, such as hypertension, diabetes, or extracranial carotid stenosis.

Panel: Scoring of CTA collateral grade

Grade 0: absent collaterals
0% filling of the occluded territory
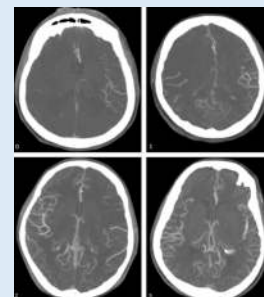
Grade 1: poor collaterals
>0% and ≤50% filling of the occluded territory

Grade 2: moderate collaterals
>50% and <100% filling of the occluded territory

Grade 3: good collaterals
100% filling of the occluded territory

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