Thrombectomy 6 to 24 hours after Stroke using Alberta Stroke Program Early CT Score (ASPECTS)

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Background

DAWN trial recently established the benefit of mechanical thrombectomy for patients with occlusion of intracranial internal carotid (ICA) or middle cerebral artery (MCA), last known to be well 6 to 24 hours earlier with deficit-infarct mismatch.

Objective

To determine outcomes for mechanical thrombectomy (MT) performed at our center 6 to 24 hours after stroke with ASPECTS ≥ 7 instead of deficit-infarct mismatch.

Methods

Analysis of extracted data, between 2013 and 2017, from local Safe Implementation of Treatment in Stroke (SITS) registry.

Patient selection: Age ≥ 18
Pre-stroke mRS 0-1
Admission brain CT ASPECTS ≥ 7
Occlusion of the intracranial ICA &/or MCA-M1 or M2, by MRA or CTA
Thrombectomy within 6-24h from TLSW

TLSW: time last seen well

ASPECTS calculated by a neuroradiologist blinded to clinical outcome.

Primary outcome: Functional independence (modified Rankin score ≤ 2 at 90 days)

Results

We identified a total of 43 patients.

Table 1. Baseline characteristics (n = 43)

Variable	Our study	DAWN MT ¹
Age at stroke onset (yr) – median, SD	69,7 $\pm$ 12,9	69,4 $\pm$ 14.1
Age ≥ 80 years – no. (%)	8 (18,6)	25 (23%)
Male sex – no. (%)	21 (48,8)	42 (39%)
NIHSS score (median, IQR)	14 (9-19)	17 (13-21)
10 – 20 – no. (%)	31 (72,1)	78 (73)
ASPECTS (median, IQR)	9 (8-9)	NA
Occlusion site – no. (%)		
Intracranial ICA	7 (16,3)	22 (21)
MCA-M1	24 (55,8)	83 (78)
MCA-M2	12 (27,9)	2 (2)

Figure 1. Cardiovascular risk factors

(IS: ischemic stroke; TIA: transient ischemic attack)

Figure 2. Type of stroke onset

Table 2. Treatment

Variable	Our study	DAWN MT ¹
Treatment with IV alteplase – no. (%)	9 (20,9)	5 (5)
Interval between TLSW and groin puncture (median, IQR)	575 min (400–730)	732 min (612–978)

Figure 3. Functional status at 90 days

No difference in functional independence at 90 days between patients younger and older than 80 years ($p=.69$), and patients with TLSW $\leq$ and above 12 h ($p=.26$).

Table 3. Secondary outcomes

Variable	Our study	DAWN MT ¹
Early response – no. (%) §	19 (44,2)	51 (48)
Post MT TICl 2b or 3 – no. (%) $\pm$	39 (90,7)	90 (84)
Death from any cause at 90 days – no. (%)	4 (9,3)	20 (19)
Symptomatic intracranial haemorrhage at 24h – no. (%)	1 (2,3)	6 (6)
Neurologic deterioration at 24h – no. (%) §§	1 (2,3)	15 (14)

§ Early response: decrease in the NIHSS of ≥ 10 pts from baseline or an NIHSS of 0 or 1 on day 5, 6, or 7 of hospitalization or at discharge if it occurred before day 5.

$\pm$ The modified Thrombolysis in Cerebral Infarction (mTICI) scale ranges from 0-3, with grade of 2b or 3 indicating reperfusion of $> 50\%$ of the affected territory

|| Symptomatic intracranial hemorrhage - presence of extravascular blood in the cranium associated with an increase in the NIHSS of ≥ 4 pts or death and judged to be the predominant cause of neurologic deterioration.

§§ Neurologic deterioration - an increase in the NIHSS of ≥ 4 pts within 5 days after stroke that was not attributed to intracranial hemorrhage or malignant cerebral edema.

Conclusion

In our series, patients with ischemic stroke last known to be well 6 to 24 hours earlier and an ASPECTS ≥ 7 treated with MT, functional independence rate at 90 days was similar to DAWN trial result (60,5% vs. 49%).

Further research is needed to determine reliability of the ASPECTS in assessing favorable outcome for this time-window.