Table 1. Patient Characteristics and Risk Factors at Baseline in JPPP

Factor	Aspirin, %	No Aspirin, %
Men	42.3	42.4
Hypertension	84.9	84.8
Dyslipidemia	72.0	71.8
Diabetes	33.9	33.9
BMI ≥ 25 kg/m^2	36.6	35.9
Currently smoking	13.3	12.9
Family history of premature CV disease	27.4	27.4

CV, cardiovascular; BMI, body mass index; JPPP, Japanese Primary Prevention Project.
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The effect of aspirin on the primary prevention of stroke varies among clinical trials conducted in Western countries, and no data have been available on the effect of aspirin in an Asian population, which is at higher risk of intracranial hemorrhage than a white population.

JPPP included 14 464 Japanese patients aged 60 to 85 years (mean age, 70 years) who presented with hypertension, dyslipidemia, or diabetes [Ikeda Y et al. *JAMA*. 2014]. Patients were randomized 1to 1 to receive aspirin 100 mg once daily or no aspirin, in addition to ongoing medications. Follow-up was a median of 5.02 years, with a maximum follow-up of 6.5 years.

The primary end point was a composite of death from cardiovascular causes (myocardial infarction, stroke, and other cardiovascular causes), nonfatal stroke (ischemic or hemorrhagic, including undefined cerebrovascular events), and nonfatal myocardial infarction.

The main results of JPPP showed no significant effect of aspirin on the primary composite end point (HR, 0.94; 95% CI, 0.77 to 1.15; $P = .54$). The prevalence of risk factors in the aspirin and no aspirin groups at baseline are shown in Table 1.

In the analysis, the number of fatal and nonfatal strokes was 128 in each group. In analyzing the data further however, the type of stroke that occurred did vary, depending on the use or non-use of aspirin. Ischemic stroke was less frequent in the aspirin vs no aspirin group (85 vs 102), but hemorrhagic stroke was more common in the aspirin group (38 vs 23). Additionally, the number of transient ischemic attacks (TIAs) was nearly half that in the aspirin vs no aspirin group (19 vs 34).

The cumulative rate of any stroke or TIA at 5 years was not different between the groups (adjusted HR, 0.927; 95% CI, 0.741 to 1.60; $P = .509$). The cumulative rate of any stroke at 5 years was also not significantly different (adjusted HR, 1.011:95% CI, 0.791 to 1.291; $P = .932$).

Table 2. Significant Risk Factors for Cerebrovascular Events by Cox Regression Analysis

Factor	HR (95% CI)	*P* Value
Age ≥ 70 y	2.207 (1.718 to 2.836)	$P < .001$
Smoking	1.513 (1.111 to 2.061)	$P = .009$
Diabetes	1.555 (1.237 to 1.954)	$P < .001$

The rate of ischemic stroke was lower in the aspirin vs no aspirin group, although this difference failed to achieve significance (adjusted HR, 0.842; 95% CI, 0.631 to 1.123; $P = .240$).

Cerebral hemorrhage was almost twice as common in the aspirin vs no aspirin group (28 vs 15, respectively), while the rates of subarachnoid hemorrhage, subdural hematoma, and other hemorrhage were comparable. The cumulative rate of intracranial hemorrhage was not significantly different between the groups (adjusted HR, 1.463; 95% CI, 0.956 to 2.237; $P = .078$). Significant risk factors for cerebrovascular events are listed in Table 2.

The rate of any stroke or TIA was not significantly different between patients randomized to aspirin or no aspirin in the low-risk or the high-risk groups based on a stroke risk score.

Treatment Benefit of Endovascular Therapy in MR CLEAN Quantified

Written by Wayne Kuznar

Endovascular therapy of large vessel acute ischemic stroke allows 1 additional patient to have fully restored neurologic function for every 7 patients treated and 1 additional patient to have improved neurologic function for every 3 to 5 patients treated.

May Nour, MD, PhD, University of California, Los Angeles, Los Angeles, California, USA, presented an analysis of the number needed to treat to benefit (NNTB) and the number needed to treat to harm (NNTH) from the MR CLEAN study [Berkhemer OA et al. *N Engl J Med*. 2015].

MR CLEAN was the first trial of thrombectomy using second-generation devices to demonstrate improved outcomes of intra-arterial treatment plus standard medical treatment compared with medical therapy alone, which included the use of intravenous tissue plasminogen activator. This prospective randomized design enrolled 500 patients in an open-label fashion with blinded end point evaluation.

The mean age of study participants was 65 years; 445 patients (89%) were treated with intravenous tissue plasminogen activator before randomization. Retrievable stents were used in 190 patients (81.5%) assigned to intra-arterial treatment. The 90-day modified Rankin scale (mRS) score—the primary outcome measure—showed a significant difference in favor of the intervention versus the control in analysis with univariable ordinal regression.

Dr Nour and colleagues sought to quantify the magnitude of the effect of the clinical improvement with intra-arterial treatment in MR CLEAN, using the size metrics of NNTB, NNTH, and the benefit per hundred (BPH) and harm per hundred treated.

They analyzed the magnitude of effect of the transitions across multiple mRS levels and for individual dichotomizations of the mRS. The following 3 analysis methods were used: joint outcome algorithmic specification, permutation analysis (Mann-Whitney test), and expert-dependent joint outcome analysis using 8 independent experts (3 stroke neurologists, 1 interventional neurologist, 2 interventional neuroradiologists, and 2 endovascular neurosurgeons).

As calculated by the absolute risk reduction in the dichotomized analysis (Table 1), the best NNTB was 6.6 and the best net BPH was 15, whereas the other 3 methods of analysis produced a much lower NNTB but a much higher BPH (Table 2).

When the results are considered together, the use of endovascular therapy compared with medical therapy alone will result in 1 of 7 treated patients not having a disability and 1 of every 3 to 5 treated patients having a lesser degree of disability, said Dr Nour. Among 100 patients treated with endovascular therapy, 15 will not have a disability and 23 to 32 will have a lesser degree of disability compared with that of patients treated with medical therapy.

This analysis of the magnitude of the treatment effect in MR CLEAN provides useful information for patients, caregivers, and physicians involved in acute stroke care, she concluded.

Table 1. NNTB and BPH in Dichotomized Analysis

Modified Rankin Scale	Absolute Risk Reduction, %[a]	NNTB	BPH
0 vs 1-6	3	33.3	3
0-1 vs 2-6	6	16.7	6
0-2 vs 3-6	14	7.1	14
0-3 vs 4-6	15	6.6	15
0-4 vs 5-6	7	14.3	7
0-5 vs 6	1	100	1

BPH, benefit per hundred; NNTB, number needed to treat to benefit.

[a]Absolute risk reduction percentages presented on behalf of the MR CLEAN investigators at World Stroke Conference, October 2014.

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Table 2. Comparison of Magnitude of Treatment Outcomes

Method of Analysis	NNTB	BPH
Dichotomized	6.6 ↔ 100	15 ↔ 1
Joint outcome table algorithmic specification	3.2	31.5
Permutation analysis	3.4	29
Joint outcome table expert dependent	4.5	22.6

BPH, benefit per hundred; NNTB, number needed to treat to benefit.

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MR CLEAN: Intra-arterial Intervention in Stroke Patients Is Safe and Effective

Written by Alla Zarifyan

Yvo B. Roos, MD, PhD, University of Amsterdam, Amsterdam, the Netherlands, presented the results from the MR CLEAN trial [Berkhemer OA et al. *N Engl J Med*. 2015], which demonstrated, for the first time, the safety and efficacy of intra-arterial treatment within 6 hours of stroke onset in patients with acute ischemic stroke caused by intracranial anterior circulation occlusion.

MR CLEAN was a multicenter, randomized, prospective, open-label, phase 3 trial with blinded assessment conducted in the Netherlands. Eligible patients were aged ≥18 years with a National Institutes of Health Stroke Scale (NIHSS) score of ≥2, who had an acute ischemic stroke due to intracranial anterior circulation occlusion and received treatment within 6 hours from stroke onset.

Intra-arterial intervention consisted of arterial catheterization with a microcatheter to the level of the intracranial arterial occlusion, followed by delivery of a thrombolytic agent, mechanical treatment, or both (the method was left to the discretion of the treating physician). The primary outcome was the score on the modified Rankin Scale (mRS) at 90 days. Secondary outcomes included neuroimaging of arterial recanalization at 24 hours and the final infarct volume at 7 days.

The study enrolled a total of 500 patients (233 in the intervention group, 267 in the control group). The main clinical characteristics, including the mean age