


Library Current Awareness Bulletin

Stroke – June 2022

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Complications

[Are beta blockers effective in preventing stroke associated infections? - a systematic review and meta-analysis](#)

Yang L., Wenping X., Jinfeng Z., Jiangxia P., Jingbo W. and Baojun W.

Aging, vol. 14

May 2022

[Background: Excessive sympathoexcitation could lead to stroke associated infection. Inhibiting sympathetic excitation may reduce the infection risk after stroke. Thus, the present study aimed to determine the protective effect of beta blockers on stroke associated infection through systematic review and meta-analysis. **Methods:** A systematic search of multiple databases were performed up to February 2022. The included studies required beta blockers therapy in stroke patients and assessed the incidence of stroke-associated infections. Outcomes of interest included infections, pneumonia, urinary tract infection and sepsis. Random-effects model was used for analysis. Heterogeneity was evaluated using I² statistics and publication bias was evaluated by the funnel plot. **Result:** A total of 83 potentially relevant publications was identified in the initial search. Six studies met the inclusion criteria for meta-analysis. The risk of bias in the included articles satisfies the quality requirement of meta-analysis. No significant associations between beta blockers therapy and the prevention of stroke associated infection, stroke associated pneumonia and septicemia were found, However, subgroup analyses revealed an association between beta blockers treatment and the increased risk of post-stroke urinary tract infection or stroke associated pneumonia in some stroke patients (OR = 1.69 [1.33, 2.14], P < 0.0001; OR = 1.85 [1.51, 2.26], P < 0.0001). **Conclusion:** Due to the lack of robust evidence, this meta-analysis may not support the preventive effect of beta blockers on stroke

associated infection. But beta blockers treatment may be associated with development of post-stroke urinary tract infection and stroke associated pneumonia in some stroke patients.]

Drug Therapy

[P2Y12 receptor inhibitor plus aspirin versus aspirin treated within 24 hours of acute noncardioembolic ischemic stroke or TIA: Meta-analysis.](#)

Huang W.Y., Ovbiagele B. and Lee M.

Journal of the Formosan Medical Association, vol. 121(6) pp. 1053-1061

June 2022

[Background/purpose: Antiplatelet therapy is the cornerstone for acute ischemic stroke or transient ischemic attack (TIA). The purpose of this study was to conduct a meta-analysis to assess the efficacy and safety of P2Y12 receptor inhibitor plus aspirin versus aspirin alone treated within 24 h after acute noncardioembolic ischemic stroke or TIA.

Methods: We search Pubmed, EMBASE, CENTRAL and clinicaltrials.gov from January 1966 to January 2021. We included randomized trials which compared P2Y12 receptor inhibitor plus aspirin versus aspirin alone. Relative risk (RR) with 95% confidence (CI) was used as a measure of P2Y12 receptor inhibitor plus aspirin versus aspirin. The primary efficacy endpoint was recurrent stroke and the primary safety endpoint was severe bleeding. **Results:** The search identified 5 randomized trials comparing P2Y12 receptor inhibitor plus aspirin and aspirin with 21,808 individuals enrolled. Pooled results from these trials showed that P2Y12 receptor inhibitor plus aspirin compared with aspirin was associated with a lower risk of recurrent stroke (RR 0.75, 95% CI 0.68 to 0.83). Ticagrelor plus aspirin compared with aspirin was associated with increased risk of severe bleeding (RR 3.98, 95% CI 1.74 to 9.10) and intracranial hemorrhage (RR 3.32, 95% CI 1.33 to 8.25), whereas clopidogrel plus aspirin vs. aspirin had similar hemorrhagic risk. **Conclusion:** P2Y12 receptor inhibitor plus aspirin vs aspirin given within 24 h after acute noncardioembolic ischemic stroke or TIA reduces the risk of subsequent stroke. However, the risk of severe bleeding, including intracranial hemorrhage, was higher with ticagrelor plus aspirin vs aspirin.]

[The efficacy and safety of fingolimod plus standardized treatment versus standardized treatment alone for acute ischemic stroke: A systematic review and meta-analysis](#)

Bai P., Zhu R., Wang P., Jiang F., Zhen J., Yao Y., Zhao C., Liang Z., Wang M., Liu B., Li M., Li N. and Yuan J.

Pharmacology Research & Perspectives, vol. 10(3)

June 2022

[Acute ischemic stroke (AIS) is the most common type of stroke. Fingolimod is a sphingosine analog that acts on sphingosine-1-phosphate receptors (S1PR). Recently, the safety and efficacy of fingolimod in both patients with intracerebral hemorrhage and patients with AIS have been investigated in proof-of-concept trials. In this review, we performed a meta-analysis to evaluate the efficacy and safety of fingolimod for AIS. This study was conducted according to the PRISMA (Preferred Reporting Items for Systemic review and Meta-Analysis) statement. We searched for publications on the PubMed, Embase, Cochrane Central Register of Controlled Trials, Clinical trials, CNKI, Wanfang Data, VIP, CBM up to August 2021. We compiled five studies; a main meta-analysis forest plots were conducted for the values of the proportion of patients whose modified Rankin scale (MRS) score was 0-1 at day 90. There were heterogeneities in each study; the method of sensitivity analysis was performed. A sensitivity analysis was performed with a mean difference (MD) of the efficacy of fingolimod plus standardized treatment versus standardized treatment alone. Random effect model is used for meta-analysis regardless of the I2 index. The analysis was carried out for categorical variables using the risk ratio (RR), LogRR, and its 95% CI. The methodological quality of each randomized controlled trial (RCTs) was assessed according to the Cochrane Collaboration tool to assess the risk of bias (ROB). A meta-analysis of five studies with 228 participants was conducted. The risk ratio of patients whose MRS score was 0-1 at day 90 between fingolimod plus standardized treatment and standardized treatment alone was 2.59 (95%CI, 1.48-4.56). The Fingolimod plus standard treatment group decreased infarct growth and improved clinical function than the standard treatment.]

[Time to benefit for stroke reduction after blood pressure treatment in older adults: A meta-analysis](#)

Ho V.S., Cenzer I.S., Nguyen B.T., and Lee S.J.

Journal of the American Geriatrics Society, vol. 70(5), pp. 1558-1568

May 2022

[Background: Hypertension treatment in older adults can decrease mortality, cardiovascular events, including heart failure, cognitive impairment, and stroke risk, but may also lead to harms such as syncope and falls. Guidelines recommend targeting preventive interventions with immediate harms and delayed benefits to patients whose life expectancy exceeds the intervention's time to benefit (TTB). Our objective was to estimate a meta-analyzed TTB for stroke prevention after initiation of more intensive hypertension treatment in adults aged ≥ 65 years. **Methods:** Studies were identified from two Cochrane systematic reviews and a search of MEDLINE and Google Scholar for subsequent publications until August 31, 2021. We abstracted data from randomized controlled trials comparing standard (untreated, placebo, or less intensive treatment) to more intensive treatment groups in older adults (mean age ≥ 65 years). We fit Weibull survival curves and used a random-effects model to estimate the pooled annual absolute risk reduction (ARR) between control and intervention groups. We applied Markov chain Monte Carlo methods to determine the time to ARR thresholds (0.002, 0.005, and 0.01) for a first stroke. **Results:** Nine trials ($n = 38,779$) were identified. The mean age ranged from 66 to 84 years and study follow-up times ranged from 2.0 to 5.8 years. We determined that 1.7 (95%CI: 1.0-2.9) years were required to prevent 1 stroke for 200 persons (ARR = 0.005) receiving more intensive hypertensive treatment. Heterogeneity was found across studies, with those focusing on tighter systolic blood pressure control (SBP < 150 mmHg) showing longer TTB. For example, in the SPRINT study (baseline SBP = 140 mmHg, achieved SBP = 121 mmHg), the TTB to avoid 1 stroke for 200 patients treated was 5.9 years (95%CI: 2.2-13.0). **Conclusions:** More intensive hypertension treatment in 200 older adults prevents 1 stroke after 1.7 years. Given the heterogeneity across studies, the TTB estimates from individual studies may be more relevant for clinical decision-making than our summary estimate.]

Post-stroke Health

[Effect of Heart Rate on 1-Year Outcome for Patients With Acute Ischemic Stroke](#)

Lee K.J., Kim B.J., Han M.K., Kim J.T., Choi K.H., Shin D.I., Cha J.K., Kim D.H., Kim D.E., Ryu W.S., Park J.M., Kang K. et al
Journal of the American Heart Association, vol. 11(10)
May 2022

[Background: Previous literature about the effect of heart rate on poststroke outcomes is limited. We attempted to elucidate (1) whether heart rate during the acute period of ischemic stroke predicts subsequent major clinical events, (2) which heart rate parameter is best for prediction, and (3) what is the estimated heart rate cutoff point for the primary outcome. **Methods and Results:** Eight thousand thirty-one patients with acute ischemic stroke who were hospitalized within 48 hours of onset were analyzed retrospectively. Heart rates between the 4th and 7th day after onset were collected and heart rate parameters including mean, time-weighted average, maximum, and minimum heart rate were evaluated. The primary outcome was the composite of recurrent stroke, myocardial infarction, and mortality up to 1 year after stroke onset. All heart rate parameters were associated with the primary outcome ($P < 0.001$). Maximum heart rate had the highest predictive power. The estimated cutoff point for the primary outcome was 81 beats per minute for mean heart rate and 100 beats per minute for maximum heart rate. Patients with heart rates above these cutoff points had a higher risk of the primary outcome (adjusted hazard ratio, 1.80 [95% CI, 1.57-2.06] for maximum heart rate and 1.65 [95% CI, 1.45-1.89] for mean heart rate). The associations were replicated in a separate validation dataset ($N=10\ 000$). **Conclusions:** These findings suggest that heart rate during the acute period of ischemic stroke is a predictor of major clinical events, and optimal heart rate control might be a target for preventing subsequent cardiovascular events.]

[Impact of drug treatment and drug interactions in post-stroke epilepsy](#)

Zhao L., Li J., Kälviäinen R., Jolkonen J., and Zhao C.
Pharmacology & Therapeutics, vol. 233
May 2022

[Stroke is a huge burden on our society and this is expected to grow in the future due to the aging population and the associated co-morbidities. The improvement of acute stroke care has increased the survival rate of stroke patients, and many patients are left with permanent disability, which makes stroke the main cause of adult disability. Unfortunately, many patients face other severe complications such as post-stroke seizures and epilepsy. Acute seizures (ASS) occur within 1 week after the stroke while later occurring unprovoked seizures are diagnosed as post-stroke epilepsy (PSE). Both are associated with a poor prognosis of a functional recovery. The underlying neurobiological mechanisms are complex and poorly understood. There are no universal guidelines on the management of PSE. There is increasing evidence for several risk factors for ASS/PSE, however, the impacts of

recanalization, drugs used for secondary prevention of stroke, treatment of stroke co-morbidities and antiseizure medication are currently poorly understood. This review focuses on the common medications that stroke patients are prescribed and potential drug interactions possibly complicating the management of ASS/PSE.]

[MORe PREciSE: a multicentre prospective study of patient reported outcome measures in stroke morbidity: a cross sectional study.](#)

Corrigan A.E., Carter B., Smith A., Pennington A., and Hewitt J.

BMC Neurology, vol. 22(1)

[Background and Purpose: The use of patient reported outcomes measures (PROMs) may offer utility that are important for stroke survivors. This study assessed the PROMIS-10, which contains Mental health (MH) and Physical Health (PH) domains, with an additional five stroke specific questions. The aim of this study was to evaluate the association between the MH and PH measures following a stroke and pre-existing health conditions. **Methods:** A multicentre prospective cohort study at 19 hospital sites across England and Wales during 2019 was conducted. The association between each PROMIS-10 domain and demographic and health conditions were calculated using a multilevel multivariable linear and present the adjusted mean difference (aMD). **Results:** The study enrolled 549 stroke survivors within 14 days of the index event, 232 were women (42.3%) and with a mean age of 72.7 years (SD = 12.9, range 25 to 97). The MH domain was scored as poor in 3.9% of participants, and very good or excellent in almost a half (48.4%). In contrast the PH domain was scored as poor in 39.9%, compared to very good or excellent in 8.5%. The MH domain was associated with pre-existing diabetes (aMD = - 2.01; 95%CI -3.91, - 0.12; p = 0.04), previous stroke (aMD = - 3.62; 95%CI -5.86, - 1.39; p = 0.001), age (aMD = 0.07; 95%CI: 0.01, 0.14; p = 0.037), and female sex (aMD = 1.91; 95%CI 0.28, 3.54; p = 0.022). The PH domain was found to be associated with sex (female) (aMD = 2.09; 95%CI 0.54, 3.65; p = 0.008) and previous stroke (aMD = - 3.05; 95%CI -5.17, - 0.93; p = 0.005). **Conclusions:** Almost half of stroke survivors reported poor PH using a PROM with less reporting poor MH. age, and sex were associated with both MH and PH domains, and additionally pre-existing diabetes and stroke were associated with poorer MH. Clinical management offers an opportunity to investigate and intervene to prevent long term poorer health in stroke survivors.]

[Prevalence of dysphagia and risk of pneumonia and mortality in acute stroke patients: a meta-analysis.](#)

Banda K.J., Chu H., Kang X.L., Liu D., Pien L.C., Jen H.J., Hsiao S.S. and Chou K.R.

BMC Geriatrics, vol. 22 (1)

May 2022

[Background: Post-stroke dysphagia (PSD) has been associated with high risk of aspiration pneumonia and mortality. However, limited evidence on pooled prevalence of post-stroke dysphagia and influence of individual, disease and methodological factors reveals knowledge gap. Therefore, to extend previous evidence from systematic reviews, we performed the first meta-analysis to examine the pooled prevalence, risk of pneumonia and mortality and influence of prognostic factors for PSD in acute stroke. **Methods:** Our search was conducted in CINAHL, Cochrane Library, EMBASE, Ovid-Medline, PubMed, and Web of Science an initial search in October 2020 and a follow-up search in May 2021. Data synthesis was conducted using the Freeman-Tukey double-arcsine transformation model for the pooled prevalence rate and the DerSimonian-Lard random-effects model for prognostic factors and outcomes of PSD. **Results:** The pooled prevalence of PSD was 42% in 42 studies with 26,366 participants. PSD was associated with higher pooled odds ratio (OR) for risk of pneumonia 4.08 (95% CI, 2.13-7.79) and mortality 4.07 (95% CI, 2.17-7.63). Haemorrhagic stroke 1.52 (95% CI, 1.13-2.07), previous stroke 1.40 (95% CI, 1.18-1.67), severe stroke 1.38 (95% CI, 1.17-1.61), females 1.25 (95% CI, 1.09-1.43), and diabetes mellitus 1.24 (95% CI, 1.02-1.51) were associated with higher risk of PSD. Males 0.82 (95% CI, 0.70-0.95) and ischaemic stroke 0.54 (95% CI, 0.46-0.65) were associated with lower risk of PSD. Haemorrhagic stroke, use of instrumental assessment method, and high quality studies demonstrated to have higher prevalence of PSD in the moderator analysis. **Conclusions:** Assessment of PSD in acute stroke with standardized valid and reliable instruments should take into account stroke type, previous stroke, severe stroke, diabetes mellitus and gender to aid in prevention and management of pneumonia and thereby, reduce the mortality rate.]

Rehabilitation

[Audio-visual stimulation for visual compensatory functions in stroke survivors with visual field defect: a systematic review](#)

Alwashmi K., Meyer G., and Rowe F.J.

Neurological Sciences, vol. 43(4) pp.2299-2321

April 2022

[Background: Hemianopia is a complete or partial blindness in the visual fields of both eyes, commonly caused by cerebral infarction. It has been hypothesized that systematic audio-visual (AV) stimulation of the blind hemifield can improve accuracy and search times, probably due to the stimulation of bimodal representations in the superior colliculus (SC), an important multisensory structure involved in both the initiation and execution of saccades.

Methods: A narrative synthesis of the findings is presented to highlight how AV rehabilitation impacts on patients with hemianopia including visual oculomotor function, functional ability in activities of daily living, hemianopic dyslexia, visual scanning and searching tasks, maintaining of functional ability post training and the effect on brain multisensory integration by using neuroimaging. **Results:** Sixteen studies were included (fourteen articles (188 participants) and two literature reviews). Results were grouped into AV training of hemianopia in adults and in children and then further grouped according to the AV task type: tasks measuring the training effects by comparing visual stimulation training to audio-visual training, localization abilities in homonymous hemianopia (HH) and AV integration in patients with HH. **Conclusion:** Systematic AV training may improve the processing of visual information by recruiting subcortical pathways, and because most of the patients with visual cortex damage have an intact SC, it might be useful to use the bimodal AV training to activate retinotectal functions. Nevertheless, the underlying mechanisms supporting the reported positive effects are not currently understood. Systematic functional and/or structural imaging studies may help in understanding the underlying mechanism and inform the design of optimal training paradigms.]

[Effect of novel training to normalize altered finger force direction post-stroke: study protocol for a double-blind randomized controlled trial](#)

Seo N.J., Kamper D.G., Ramakrishnan V., Harvey J.B., Finetto C., Schranz C., Scronce G., Coupland K., Howard K. et al
Trials, vol. 23(1)

April 2022

[Background: Functional task performance requires proper control of both movement and force generation in three-dimensional space, especially for the hand. Control of force in three dimensions, however, is not explicitly treated in current physical rehabilitation. To address this gap in treatment, we have developed a tool to provide visual feedback on three-dimensional finger force. Our objective is to examine the effectiveness of training with this tool to restore hand function in stroke survivors. **Methods:** Double-blind randomized controlled trial. All participants undergo 18 1-h training sessions to practice generating volitional finger force of various target directions and magnitudes. The experimental group receives feedback on both force direction and magnitude, while the control group receives feedback on force magnitude only. The primary outcome is hand function as measured by the Action Research Arm Test. Other outcomes include the Box and Block Test, Stroke Impact Scale, ability to direct finger force, muscle activation pattern, and qualitative interviews. **Discussion:** The protocol for this clinical trial is described in detail. The results of this study will reveal whether explicit training of finger force direction in stroke survivors leads to improved motor control of the hand. This study will also improve the understanding of neuromuscular mechanisms underlying the recovery of hand function.]

[Effect of vagus nerve stimulation paired with rehabilitation for upper limb function improvement after stroke: a systematic review and meta-analysis of randomized controlled trials](#)

Zhao K., Yang J., Huang J., Zhao Z. and Qu Y.

International Journal of Rehabilitation Research, vol. 45(2) pp.99-108.

June 2022

[Vagus nerve stimulation (VNS) could potentially facilitate arm function recovery after stroke. The aim of this review was to evaluate the effect of VNS paired with rehabilitation on upper limb function recovery after stroke. We considered randomized controlled trials (RCTs) that used VNS paired with rehabilitation for the improvement of upper limb function after stroke and were published in English. Eligible RCTs were identified by searching electronic databases, including MEDLINE, Web of Science, Embase, CENTRAL and PEDro, from their inception until June 2021. Quality of included studies was assessed using PEDro score and Cochrane's risk of bias assessment. A meta-analysis

was performed on the collected data. Five studies with a total of 178 participants met the inclusion criteria. Overall, the present meta-analysis revealed a significant effect of VNS on Fugl–Meyer Assessment for Upper Extremity (FMA-UE, MD = 3.59; 95% CI, 2.55–4.63; $P < 0.01$) when compared with the control group. However, no significant difference was observed in adverse events associated with device implantation between the invasive VNS and control groups (RR = 1.10; 95% CI, 0.92–1.32; $P = 0.29$). No adverse events associated with device use were reported in invasive VNS, and one was reported in transcutaneous VNS. This study revealed that VNS paired with rehabilitation can facilitate the recovery of upper limb function in patients with stroke on the basis of FMA-UE scores, but the long-term effects remain to be demonstrated.]

[Effectiveness and Success Factors of Bilateral Arm Training After Stroke: A Systematic Review and Meta-Analysis.](#)

Chen S., Qiu Y., Bassile C.C., Lee A., Chen R. and Xu D.

Frontiers in Aging Neuroscience

April 2022

[Bilateral arm training (BAT) presents as a promising approach in upper extremity (UE) rehabilitation after a stroke as it may facilitate neuroplasticity. However, the effectiveness of BAT is inconclusive, and no systematic reviews and meta-analyses have investigated the impact of different factors on the outcomes of BAT. This systematic review and meta-analysis aimed to (1) compare the effects of bilateral arm training (BAT) with unilateral arm training (UAT) and conventional therapy (CT) on the upper limb (UL) motor impairments and functional performance post-stroke, and (2) investigate the different contributing factors that may influence the success of BAT. A comprehensive literature search was performed in five databases. Randomized control trials (RCTs) that met inclusion criteria were selected and assessed for methodological qualities. Data relating to outcome measures, characteristics of participants (stroke chronicity and severity), and features of intervention (type of BAT and dose) were extracted for meta-analysis. With 25 RCTs meeting the inclusion criteria, BAT demonstrated significantly greater improvements in motor impairments as measured by Fugl-Meyer Assessment of Upper Extremity (FMA-UE) than CT (MD = 3.94, $p < 0.001$), but not in functional performance as measured by the pooled outcomes of Action Research Arm Test (ARAT), Box and Block Test (BBT), and the time component of Motor Function Test (WMFT-time) (SMD = 0.28, $p = 0.313$). The superior motor impairment effects of BAT were associated with recruiting mildly impaired individuals in the chronic phase of stroke (MD = 6.71, $p < 0.001$), and applying a higher dose of intervention (MD = 6.52, $p < 0.001$). Subgroup analysis showed that bilateral functional task training (BFTT) improves both motor impairments (MD = 7.84, $p < 0.001$) and functional performance (SMD = 1.02, $p = 0.049$). No significant differences were detected between BAT and UAT for motor impairment (MD = -0.90, $p = 0.681$) or functional performance (SMD = -0.09, $p = 0.457$). Thus, our meta-analysis indicates that BAT may be more beneficial than CT in addressing post-stroke UL motor impairment, particularly in the chronic phase with mild UL paresis. The success of BAT may be dose-dependent, and higher doses of intervention may be required. BFTT appears to be a valuable form of BAT that could be integrated into stroke rehabilitation programs. BAT and UAT are generally equivalent in improving UL motor impairments and functional performance.]

Stroke Recurrence

[mHealth impact on secondary stroke prevention: a scoping review of randomized controlled trials among stroke survivors between 2010-2020.](#)

Adcock A.K., Haggerty T., Crawford A., and Espinosa C.

MHealth, vol. 8

April 2022

[Background: A fundamental gap between clinical prevention and self-management awareness heightens the risk for stroke recurrence in approximately one-fourth of the highest risk stroke survivors annually. Secondary stroke prevention has the potential to be promoted by mobile health (mHealth) applications for effective real-world adoption of vascular risk factor mitigation. This scoping review aims to evaluate the impact of mHealth interventions and their effectiveness to reduce recurrent stroke rates among stroke survivors in randomized controlled trials (RCTs). **Methods:** Scoping review in Ovid Medline, Cochrane Library, CINAHL, and Scopus for RCT literature employing mHealth among stroke populations published in English from 2010 to November 19, 2020. Small or pilot studies that included randomized design were included. **Results:** A total of 352 abstracts met inclusion criteria; 31 full-text articles were assessed and 18 unique RCTs involving 1,453 patients ultimately fulfilled criteria. Twelve of 18 met the pre-defined primary outcome measure, including 2 studies evaluating feasibility. Eight of 18 only addressed

recovery from index stroke deficits. Most outcomes focused on self-reported functional status, mood, quality of life or compliance with intervention; primary outcome was an objective metric in 4/18 (blood pressure readings, step number, obstructive sleep apnea support compliance). Intervention duration 2-12 months, with a median 9 weeks. **Conclusions:** No high-quality evidence supporting mHealth applications to reduce recurrent stroke was found in this scoping review. Overall, most studies were relatively small, heterogenous, and employed subjective primary outcome measures. mHealth's potential as an effective tool for stroke stakeholders to reduce recurrent stroke rates has not been sufficiently demonstrated in this review. Future randomized studies are needed that explicitly evaluate stroke recurrence rate.]

[Predictors of very early stroke recurrence in the POINT trial population](#)

Bourand N. and Brorson J.R.

BMC Neurology, vol. 22(1)

May 2022

[Background: Recent trials of acute secondary prevention in patients with minor ischemic stroke or transient ischemic attack (TIA) have demonstrated high rates of early recurrence within days of the initial event. Identifying clinical features associated with early recurrence may guide focused management. **Methods:** Using logistic regression applied to the data of the Platelet Oriented Inhibition in New TIA and Minor Ischemic Stroke (POINT) trial, we evaluated what baseline clinical factors predict outcome events occurring within 7 days of randomization. **Results:** In the POINT trial, 181 subjects (3.7%) had early recurrence, defined as primary outcome events within 7 days of trial entry, whereas only 100 outcome events occurred over the remainder of the 90 day trial. Protective effects of dual antiplatelet therapy with clopidogrel plus aspirin were seen only as a reduction in these early recurrences, without any impact on later events. In univariate analysis, systolic blood pressure, diastolic blood pressure, serum glucose, initial carotid imaging results, study cohort (minor stroke or TIA), and treatment assignment were significantly associated with early recurrence. Multivariate logistic regression analysis identified a number of factors with significant independent associations with early recurrence, including carotid stenosis or occlusion (Odds Ratio [OR] 2.77; 95% confidence interval [CI] 1.78-4.31), cohort (minor stroke versus TIA) (OR 1.86; 95% CI 1.33-2.58), race (OR 1.57; 95% CI 1.10-2.25), baseline statin use (OR 0.68; 95% CI 0.49-0.95), systolic blood pressure (OR 1.10; 95% CI 1.03-1.18), serum glucose (OR 1.03; 95% CI 1.01-1.05), and age (OR 1.02; 95% CI 1.00-1.03). Receiver Operator Characteristic (ROC) analysis showed a 70% accuracy of the resulting logistic model in predicting early recurrence. **Conclusions:** Early recurrence is high, and is concentrated in the first 7 days, in patients with minor stroke or TIA. A number of baseline clinical factors, including carotid disease, presentation with minor stroke rather than TIA, race, absence of statin usage, systolic blood pressure, and serum glucose, are independently associated with early event recurrence in the POINT trial population.]

[Risk Factors of Recurrent Stroke in Young and Middle-Aged Stroke Patients after Interventional Therapy](#)

Dai X., Wang F., Lv H., and Cheng X.

Computational and Mathematical Methods in Medicine

April 2022

[Objective: To explore the risk factors of recurrent stroke in young and middle-aged stroke patients after interventional therapy. **Methods:** Retrospective analysis was conducted on the data of 300 young and middle-aged stroke patients treated in our hospital (February 2015-February 2017). All patients received interventional therapy. They were followed up continuously after the interventional therapy, with recurrent stroke as the only endpoint event, and those who did not have the endpoint events were followed up for 5 years. Then, the patients were divided into the occurrence group and the nonoccurrence group according to whether there was a stroke. The social demographic data and clinical examination data of all patients were collected to analyze the differences between the groups. Logistic regression analysis was performed on the factors with statistically significant differences to verify the factors affecting recurrent stroke in young and middle-aged stroke patients after interventional therapy. **Results:** Among the 300 patients, 69 (23.0%) had recurrent stroke and 231 (77.0%) had no recurrent stroke. The occurrence group (n = 69) had 12 cases (17.4%) of massive cerebral infarction, 18 cases (26.1%) of cerebral watershed infarction, 5 cases (7.2%) of multiple cerebral infarction, 25 cases (36.2%) of lacunar infarction, and 9 cases (13.0%) of TIA. Notable differences were observed in age, drinking history, marital status, body weight, diastolic pressure, systolic pressure, fasting blood glucose, glycosylated hemoglobin, cholesterol, and fibrinogen between the occurrence group and the nonoccurrence group (P < 0.05). The binary logistic regression analysis showed that age, drinking history, diastolic pressure, fasting blood glucose, glycosylated hemoglobin, cholesterol, and fibrinogen were the influencing factors of recurrent stroke in young and middle-aged stroke patients after

interventional therapy. **Conclusion:** Blood glucose, blood lipid, blood pressure, age, and living habits have an impact on recurrent stroke in young and middle-aged patients after interventional therapy. Therefore, while strictly controlling blood glucose, blood lipid, and blood pressure, patients should improve their living habits and enhance the awareness of prevention after interventional therapy.]

Stroke Risk

[Does Dexmedetomidine Reduce the Risk of Atrial Fibrillation and Stroke After Adult Cardiac Surgery? A Systematic Review and Meta-analysis of Randomized Controlled Trials](#)

Jing C., Lin L., Zhou T. Li Y.L., Fu L., and Gao M.Q.

Anatolian Journal of Cardiology, vol. 26(5), pp. 354-365

May 2022

[Background: Postoperative atrial fibrillation is a common consequence of cardiac surgery with increased stroke complications and mortality. Although dexmedetomidine is thought to prevent postoperative atrial fibrillation and stroke because of its sympatholytic and anti-inflammatory properties, data from different studies show the effect of dexmedetomidine on postoperative atrial fibrillation and stroke uncertain in adult patients with cardiac surgery.

Methods: A database including EMBASE, PubMed, and Cochrane CENTRAL was searched for randomized controlled trials comparing dexmedetomidine with placebo or other anesthetic drugs in adult cardiac surgery. The primary outcome was the incidence of postoperative atrial fibrillation. The secondary outcomes were the incidence of postoperative stroke, mechanical ventilation duration, intensive care unit length of stay, hospital length of stay, and mortality. **Results:** Eighteen trials with a total of 2933 patients were enrolled in the meta-analyses. Compared with controls, dexmedetomidine significantly reduced the incidence of post-operative atrial fibrillation [odds ratio, 0.82; 95% CI, 0.69-0.98; P = .03]. There was no significant difference between groups in stroke (odds ratio, 1.36; 95% CI, 0.59-3.16; P = .47), mechanical ventilation duration [weighted mean difference, -0.17; 95% CI, -0.35 to 0.14; P=.39], intensive care unit length of stay (weighted mean difference, -0.03; 95% CI, -0.93 to 0.87; P = .95), hospital length of stay (weighted mean difference, -0.04; 95% CI, -0.40 to 0.32; P = .83) and mortality (odds ratio, 0.72; 95% CI, 0.32-1.60; P = .42). **Conclusion:** Perioperative dexmedetomidine reduced the incidence of postoperative atrial fibrillation in adult patients undergoing cardiac surgery. But there was no significant difference in the incidence of stroke, mechanical ventilation duration, intensive care unit length of stay, hospital length of stay, and mortality.]

[Pregnancy and stroke risk in women](#)

Katsafanas C. and Bushnell C.

Neurobiology of Disease, vol. 169

July 2022

[Stroke associated with pregnancy and post-partum occurs in about 30 per 100,000 deliveries, and includes subtypes of ischemic and hemorrhagic stroke as well as cerebral venous sinus thrombosis (CVST). There are a wide variety of underlying causes and risk factors, some that are common to both pregnant and non-pregnant women, and others that are unique to pregnancy. Although some of the strokes that occur may be a direct result of the pregnancy itself, such as hypertensive disorders of pregnancy, others could be anticipated or prevented by understanding the risk factors. These may include the presence of pre-pregnancy clotting disorders, aneurysms or arteriovenous malformations, hypertension, diabetes, or advanced maternal age. Treatment of stroke during pregnancy is based on the current recommendations for non-pregnant stroke patients, assuming the benefit of these treatments is likely higher than the risks. These decisions must be made with the appropriate specialists in stroke and endovascular treatment, as well as high-risk obstetrician/gynecologists, and most importantly, patient and family preferences.]

[Role of diet in stroke incidence: an umbrella review of meta-analyses of prospective observational studies](#)

Guo N., Zhu Y., Tian D., Zhao Y., Zhang C., Mu C., Han C., Zhu R. and Liu X.

BMC Medicine, vol. 20 (1)

May 2022

[Background: Stroke is one of the major challenges for the global healthcare system, which makes it necessary to explore the relationship between various modifiable factors and stroke risk. Recently, numerous meta-analyses of prospective observational studies have reported that dietary factors played a key role in the occurrence of stroke. However, the conclusions of previous studies have remained controversial and unclear. Accordingly, we conducted an umbrella review synthesizing and recalculating available evidence to assess the certainty of the associations

between dietary factors and stroke. **Methods:** Relevant meta-analyses examining the associations between dietary factors and stroke were searched in PubMed and Embase databases up to September 1, 2021. For each eligible meta-analysis, two independent reviewers appraised the methodologic quality using the AMSTAR 2 criteria and estimated the summary effect size, 95% confidence intervals, 95% prediction intervals, heterogeneity between studies, and small-study effects. Moreover, we further assessed the associations between dietary factors and ischemic stroke as well as hemorrhagic stroke. Lastly, a set of pre-specified criteria was applied to qualitatively evaluate the epidemiological credibility of each dietary factor. **Results:** Overall, our umbrella review included 122 qualified meta-analyses for qualitative synthesis, involving 71 dietary factors related to food groups, foods, macronutrients, and micronutrients. Using the AMSTAR 2 criteria, 5 studies were assessed as high quality, 4 studies as moderate quality, and 113 studies as low or critically low quality. We identified 34 dietary factors associated with stroke occurrence, 25 dietary factors related to ischemic stroke, and 11 factors related to hemorrhagic stroke. Among them, high/moderate certainty epidemiological evidence demonstrated an inverse association between intake of fruits (RR: 0.90) and vegetables (RR: 0.92) and stroke incidence, but a detrimental association between red meat (RR: 1.12), especially processed red meat consumption (RR:1.17), and stroke incidence. Besides, the evidence of high/moderate certainty suggested that the intake of processed meat, fruits, coffee, tea, magnesium, and dietary fiber was associated with ischemic stroke risk, while consumption of tea, fruits, and vegetables was relevant to hemorrhagic stroke susceptibility. **Conclusions:** Our study has reported that several dietary factors have a significant impact on stroke risk and offered a new insight into the relationship between dietary modification and stroke occurrence. Our results may provide an effective strategy for stroke prevention.]

[Trends in the Incidence and Risk Factors of Pregnancy-Associated Stroke](#)

Ijäs P.

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[Pregnancy is a female-specific risk factor for stroke. Although pregnancy-associated stroke (PAS) is a rare event, PAS leads to considerable maternal mortality and morbidity. It is estimated that 7.7-15% of all maternal deaths worldwide are caused by stroke and 30-50% of surviving women are left with persistent neurological deficits. During last decade, several studies have reported an increasing incidence of PAS. The objective of this review is to summarize studies on time trends of PAS in relation to trends in the prevalence of stroke risk factors in pregnant women. Seven retrospective national healthcare register-based cohort studies from the US, Canada, UK, Sweden, and Finland were identified. Five studies from the US, Canada, and Finland reported an increasing trend of PAS. Potential biases include more sensitive diagnostics and improved stroke awareness among pregnant women and professionals toward the end of the study period. However, the concurrent increase in the prevalence of several stroke risk factors among pregnant women, particularly advanced age, hypertensive disorders of pregnancy, diabetes, and obesity, indicate that the findings are likely robust and should be considered seriously. To reduce stroke in pregnancy, increased awareness among all medical specialties and pregnant women on the importance of risk-factor management during pregnancy and stroke symptoms is necessary. Important preventive measures include counseling for smoking cessation and substance abuse, treatment of hypertensive disorders of pregnancy, use of aspirin in women at high risk for developing preeclampsia, and antithrombotic medication and pregnancy surveillance for women with high-risk conditions. Epidemiological data from countries with a high risk-factor burden are largely missing. National and international registries and prospective studies are needed to increase knowledge on the mechanisms, risk factors, management, and future implications for the health of women who experience this rare but devastating complication of pregnancy.]

Thrombectomy / Endovascular Treatment

[Effect of supraglottic airway devices versus endotracheal intubation general anesthesia on outcomes in patients undergoing mechanical thrombectomy: A prospective randomized clinical trial.](#)

Zhao J., Zhu W., Qi Y., Xu G., Liu L. and Liu J.

Medicine, vol. 101

May 2022

[Background: There are still controversies about the optimal anesthesia protocol for patients with acute ischemic stroke (AIS) undergoing mechanical thrombectomy (MT). The aim of this study was to explore the effect of supraglottic airway device (SAD) versus endotracheal intubation (EI) general anesthesia on clinical and angiographic

outcomes in patients with AIS undergoing MT. **Methods:** One hundred sixteen patients with large-vessel occlusion stroke were randomized to receive either SAD or EI general anesthesia. The primary outcome was the rate of occurrence of >20% fall in mean arterial pressure (MAP). Secondary outcomes included hemodynamics, successful recanalization, time metrics, satisfaction score of neurointerventionalist, number of passes performed, the conversion rate from SAD to EI, the National Institutes of Health Stroke Scale score, and Alberta Stroke Program Early CT Score before and 24 hours after surgery, length of stay in the stroke unit and hospital, complications and functional independence at discharge, and 90 days after stroke. **Results:** Both the lowest systolic blood pressure and lowest diastolic blood pressure were significantly lower in the EI group ($P = .001$). The consumption of vasoactive agents, the occurrence of >20% reduction in MAP and time spent with >20% fall in MAP were significantly higher in the EI group ($P < .05$). Compared with the EI group, the time for door-to-puncture was significantly shorter in the SAD group ($P = .015$). There were no significant differences with respect to puncture-to-reperfusion time, number of passes performed, rates of successful recanalization, National Institutes of Health Stroke Scale score, and Alberta Stroke Program Early CT Score 24 hours after surgery. The satisfaction score of neurointerventionalist was significantly lower in the EI group ($P = .043$). Conversion rate from SAD to EI was 7.41%. There were no significant differences with respect to complications, mortality, and mean Modified Rankin Scale scores both at discharge and 90-day after stroke. However, length of stroke unit and hospital stays were significantly shorter in the SAD group ($P < .05$). **Conclusion:** AIS patients undergoing MT with SAD general anesthesia led to more stable hemodynamics, higher satisfaction score of neurointerventionalist, shorter door-to-puncture time, length of stroke unit, and hospital stay. However, there were no significant differences between the 2 groups on the angiographic and functional outcomes both at discharge and 90 days after stroke.]

[First-line contact aspiration versus first-line stent retriever for acute posterior circulation strokes: an updated meta-analysis.](#)

Ye G., Wen X., Wang H., Sun C., Pan Z., Chen M., Wang B. and Li Z.

Journal of Neurointerventional Surgery, vol. 14(5).

May 2022

[Background: Both stent retriever (SR) and contact aspiration (CA) are widely used as first-line strategies for acute posterior circulation strokes (PCS). However, it is still unclear how CA and SR compare as the first-line treatment of acute PCS. Several new studies have been published recently, so we aimed to perform an updated meta-analysis.

Methods: The meta-analysis was conducted according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) statement. Random-effects models were performed to pool the outcomes and the value of I^2 was calculated to assess the heterogeneity. **Results:** Ten observational studies with 1189 patients were included, among whom 492 received first-line CA and 697 received first-line SR. The pooled results revealed that first-line CA could achieve a significantly higher proportion of modified Thrombolysis In Cerebral Infarction (mTICI) 2b/3 (OR 1.90, 95% CI 1.33 to 2.71, $I^2 = 0\%$), mTICI 3 (OR 1.95, 95% CI 1.15 to 3.31, $I^2 = 59.6\%$), first-pass effect (OR 2.91, 95% CI 1.51 to 5.58, $I^2 = 0\%$), lower incidence of new-territory embolic events (OR 0.20, 95% CI 0.05 to 0.83, $I^2 = 0\%$), and shorter procedure time (mean difference -29.4 min, 95% CI -46.8 to -12.0 min, $I^2 = 62.8\%$) compared with first-line SR. At 90-day follow-up, patients subjected to first-line CA showed a higher functional independence (modified Rankin Scale score 0-2; OR 1.38, 95% CI 1.01 to 1.87, $I^2 = 23.5\%$) and a lower mortality (OR 0.71, 95% CI 0.50 to 1.00, $p = 0.050$, $I^2 = 0\%$) than those subjected to first-line SR. **Conclusions:** This meta-analysis suggests that the first-line CA strategy could achieve better recanalization and clinical outcomes for acute PCS than first-line SR. Limited by the quality of included studies, this conclusion should be drawn with caution.]

[Mechanical thrombectomy versus intravenous alteplase alone in acute isolated posterior cerebral artery occlusion: a systematic review](#)

Monteiro A., Khan S., Waqas M., Dossani R.H., Ruggiero N., Siddiqi N.M., Baig A.A., Rai H.H., Cappuzzo J.M et al
Journal of Neurointerventional Surgery, vol. 14(6), pp. 564-567.

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[Background: Acute isolated posterior cerebral artery occlusions (aPCAOs) were excluded or under-represented in major randomized trials of mechanical thrombectomy (MT). The benefit of MT in comparison to intravenous tissue plasminogen activator (alteplase; IV-tPA) alone in these patients remains controversial and uncertain.


Methods: We performed a systematic search of PubMed, MEDLINE, and EMBASE databases for articles comparing MT with or without bridging IV-tPA and IV-tPA alone for aPCAO using keywords ('posterior cerebral artery', 'thrombolysis' and 'thrombectomy') with Boolean operators. Extracted data from patients reported in the studies


were pooled into groups (MT vs IV-tPA alone) for comparison. Estimated rates for favorable outcome (modified Rankin scale score 0-2), symptomatic intracranial hemorrhage (sICH), and mortality were extracted.

Results: Seven articles (201 MT patients, 64 IV-tPA) were included, all retrospective. There was no statistically significant difference between pooled groups in median age, median presentation National Institutes of Health Stroke Scale (NIHSS) score, PCAO segment, and median time from symptom onset to puncture or needle. The recanalization rate was significantly higher in the MT group than the IV-tPA group (85.6% vs 53.1%, $p < 0.00001$). Odds ratios for favorable outcome (OR 1.5, 95% CI 0.8 to 2.5), sICH (OR 1.1, 95% CI 0.2 to 5.5), and mortality (OR 1.4, 95% CI 0.5 to 3.6) did not significantly favor any modality. **Conclusions:** We found no significant differences in odds of favorable outcome, sICH, and mortality in MT and IV-tPA in comparable aPCAO patients, despite superior MT recanalization rates. Equipose remains regarding the optimal treatment modality for these patients.]

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