

Neurology

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SPECIAL ISSUE: STROKE

Special Report from the 2021 International Stroke Conference

By Matthew E. Fink, MD, Editor

Feil Professor and Chairman, Department of Neurology, and Assistant Dean of Clinical Affairs, Weill Cornell Medical College; Neurologist-in-Chief, New York Presbyterian Hospital

Message from the editor: This is a special report from the International Stroke Conference 2021, produced virtually this year by the American Heart Association and the American Stroke Association. The opinions expressed are exclusively those of this author, and all questions should be directed to me personally. There were hundreds of presentations made at the conference, and I selected the ones I thought were of greatest importance to our readers. I focused particularly on “late-breaking trials” because of their important clinical implications around acute stroke treatment.

Direct Transfer to Angiography for Patients with Suspected LVO vs. Evaluation by CT Angiogram

SOURCE: Requena M, et al. LB-1: Evaluation of direct transfer to angiography suite vs. computed tomography suite in endovascular treatment of stroke: ANGIO-CAT randomized clinical trial. Presented at the International Stroke Conference, March 17-19, 2021.

In patients with suspected large vessel occlusion (LVO) ischemic stroke, direct transfer to the angiography suite has been described as an effective measure to reduce time for

endovascular treatment. The investigators designed a randomized controlled trial to study the effect of direct transfer to angiography on clinical outcome compared to conventional imaging workflow, which includes transfer to computed tomography (CT) with CT angiography (CTA) and CT perfusion prior to angiography. During 20 months of the trial, patients with suspected LVO were randomly assigned based on rapid arterial occlusion evaluation (RACE) > 4 and the National Institutes of Health Stroke Scale score (NIHSS) > 10 on arrival, < 6 hours from stroke onset. Safety outcomes were symptomatic

Financial Disclosure: Dr. Rubin (author) reports he is a consultant for Merck Sharpe & Dohme Corp. All of the relevant financial relationships listed for this individual has been mitigated. None of the remaining authors or planners for this educational activity have relevant financial relationships to disclose with ineligible companies whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients.

Neurology Alert (ISSN 0741-4234) is published monthly by Relias LLC, 1010 Sync St., Ste. 100, Morrisville, NC 27560-9468. Periodicals postage paid at Morrisville, NC, and additional mailing offices. POSTMASTER: Send address changes to Neurology Alert, Relias LLC, 1010 Sync St., Ste. 100, Morrisville, NC 27560-9468.

GST Registration Number: R128870672.

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intracerebral hemorrhage and in-hospital mortality in all patients. The primary efficacy measure was modified Rankin Scale score at three months in patients who ultimately were diagnosed with LVO. Enrollment was stopped after an interim analysis of the first 150 patients.

There were no significant differences in baseline variables between the groups. Mean onset to door time was 225 minutes, and mean admission NIHSS = 18. The rate of direct admissions was 32.6%. In comparing the direct admission group to the CTA group, the rates of spontaneous intracerebral hemorrhage (ICH) were 7.8% vs. 5.5%, the rates of LVO strokes were 84% vs. 86%, and the rates of intravenous tissue plasminogen activator (IV tPA) treatment were 52% vs. 51%. Direct transfer to the angiography suite reduced mean door to groin time significantly (19 minutes vs. 43 minutes [$P < 0.01$]), and stroke onset to perfusion time was reduced (277 minutes vs. 331 minutes [$P = 0.015$]). The severity of disability over the range of the modified Rankin Scale score was reduced by one point. Symptomatic ICH was less, at 1.4% vs. 7.2%, and in-hospital mortality at 90 days was reduced in the direct angiography group, 20.2% vs. 32.9%. In conclusion, direct transfer to the angiography suite reduced the time from onset of symptoms to reperfusion and improved post-stroke disability at 90 days. ■

Mobile Stroke Unit Treatment Compared to Standard EMS Treatment

SOURCE: Grotta JC, et al. LB-2: Benefits of stroke treatment delivered by a mobile stroke unit compared to standard management by emergency medical services (BEST-MSU Study). Presented at the International Stroke Conference, March 17-19, 2021.

Mobile stroke units (MSUs) are specially equipped ambulances with an installed computed tomography (CT) scanner, medications for treating acute ischemic stroke (including thrombolytics) and specially trained staff who can diagnose and treat stroke in the field. Investigators from Houston,

Denver, Memphis, New York City, Los Angeles, and Indianapolis participated in this study to evaluate the benefits of MSUs compared to standard emergency management (SM) in the treatment of patients with acute ischemic stroke. The study analyzed outcomes at 90 days using a utility-weighted modified Rankin Scale score for patients treated on MSU compared to SM, on an alternating week schedule of availability of an MSU. All patients who were candidates for tissue plasminogen activator (tPA) were eligible for enrollment, and a blinded evaluator subsequently determined if the patients were tPA eligible based on accepted criteria. A blinded evaluator also determined the 90-day outcome assessment for both groups.

A total of more than 10,000 emergency alerts resulted in the identification of 1,500 patients for evaluation into the study. Of those, 1,047 were tPA eligible and were part of the study. A total of 617 tPA eligible patients were treated on the MSU, and 430 tPA eligible patients were treated with SM. Baseline characteristics were similar in the two groups. The median National Institutes of Health Stroke Scale score (NIHSS) was 9. Twenty percent of patients had a baseline disability of varying degrees, but all of them were included in this study and evaluated in a similar fashion. Nine percent of patients in both groups had a stroke mimic, similar to that seen in hospital emergency departments.

The median time to treatment from last known normal on the MSU was 72 minutes vs. 108 minutes in the SM group ($P < 0.001$). The time to treatment after emergency medical services (EMS) alert was 46 minutes vs. 78 minutes, also significant. There was no effect on the time for patients to arrive for endovascular treatment between the two groups. Fully one-third of patients on the MSU were treated with thrombolytic therapy within 60 minutes of the onset of symptoms, compared to only 3% in the SM group. This group has a particularly good result from intravenous thrombolysis because of the early stage of clot formation, which is amenable to thrombolysis. A higher

percentage of eligible patients were treated with thrombolysis on the MSU than SM, 97% vs. 79%. The primary outcome was reached; patients treated on the MSU attained a significantly better outcome on the utility-weighted modified Rankin Scale score. Patients treated on the MSU had a higher probability of attaining a modified Rankin Scale score of 0 or 1 compared to SM. The rate of symptomatic hemorrhage was 2% in each group, and there were no hemorrhages in any of the stroke mimic patients.

The overall benefits were driven by results in patients who were treated within 60 minutes of the onset of symptoms. In that group, 70% recovered to their normal baseline function when receiving intravenous thrombolysis on the MSU. ■

Endovascular Thrombectomy with and Without IVT

SOURCE: LeCouffe NE, et al., on behalf of the MR CLEAN-NO IV investigators. LB-3: Intravenous thrombolysis followed by endovascular thrombectomy versus direct endovascular thrombectomy: A randomized controlled trial. Presented at the International Stroke Conference, March 17-19, 2021.

Current guidelines for the treatment of acute ischemic stroke recommend that intravenous thrombolysis (IVT) be administered to eligible patients with a suspected large vessel occlusion, prior to the start of endovascular thrombectomy (EVT). However, several recent studies suggest that the added value of IVT is unclear in patients who undergo EVT. The aim of this trial was to directly assess the benefit and safety of direct EVT compared to IVT followed by EVT in patients with acute ischemic stroke caused by a large vessel occlusion in the anterior circulation.

MR CLEAN-NO IV was a randomized, controlled, blinded trial. Patients with acute ischemic stroke were eligible if they had a documented occlusion of the intracranial internal carotid artery, M1, or proximal M2, a National Institutes of Health Stroke Scale score of 2 or more, and presented within 4.5 hours of the onset of symptoms. Patients were excluded if they had significant pre-stroke disability or a contraindication to IVT. Patients were included only by presenting directly to the thrombectomy-capable hospital. They were randomly assigned in a 1:1 ratio to direct intervention or thrombolysis followed by EVT.

The primary endpoint was the modified Rankin scale score at 90 days, and secondary endpoints were the thrombolysis in cerebral infarction (TICI) score and final volume of the infarct.

Safety assessments were symptomatic intracranial hemorrhage and embolization in a new territory causing a new ischemic stroke.

A total of 540 patients were enrolled in 20 centers in the Netherlands, Belgium, and France. In the primary analysis, there were no significant differences in outcome at 90 days between the two groups, and direct EVT showed neither noninferiority to nor superiority over IVT plus thrombectomy in patients with ischemic stroke.

Symptomatic hemorrhage occurred in 5.9% of EVT patients and in 5.3% of those treated with thrombolysis. This was a surprise for the investigators. The likely explanation is that symptomatic hemorrhage is related to reperfusion, and that use of the intravenous thrombolytic does not add increased risk for hemorrhage. Mortality was slightly higher in the direct thrombectomy cases (20.5% vs. 15.8%), but this was not statistically significant. This study does not answer the question about the superiority of one approach over the other. ■

More on Intravenous Thrombolysis Before Endovascular Thrombectomy in an International Meta-Analysis

SOURCE: Nogueira RG for SHINE investigators. LB-4: Systemic thrombolysis randomization in endovascular stroke therapy collaboration. Presented at the International Stroke Conference, March 17-19, 2021.

The use of intravenous thrombolysis prior to endovascular thrombectomy continues to be debated, and several studies are looking at this issue. The SHINE collaborators pooled patient-level data from several studies that were performed in Japan (SKIP) and China (DEVT) to look at outcomes with a larger cohort of patients than either study was able to assess. Individual studies did not show definite superiority of endovascular thrombectomy alone compared to intravenous thrombolysis administered before thrombectomy.

The hypothesis was that a larger group of patients would provide more definitive information. The primary outcome was functional independence; the secondary outcome was a change in disability based on the modified Rankin Scale score at 90 days. Adjustments were made for random effects and between-trial variations.

Regression models were used to compute odds ratios for the primary and secondary outcomes in the overall population, after adjustment for

age, sex, baseline National Institutes of Health Stroke Scale score, premorbid modified Rankin Scale score, site of occlusion, baseline computed tomography imaging, and stroke onset to time of randomization.

Individual data were analyzed for 438 patients, 217 assigned to primary thrombectomy and 221 assigned to combined therapy of thrombolysis followed by thrombectomy. The primary endpoint, functional independence, was assessed by looking at the 90-day modified Rankin Scale score of 0-1, 0-2, and 0-3.

The percentage of combined therapy patients who reached a 90-day modified Rankin Scale score of 0-2 was 51.6%, compared to 56.7% of patients who underwent primary thrombectomy alone. The odds ratio was 1.27, but this was not statistically significant. By combining a larger group and looking at a modified Rankin Scale score of 0-3, 67% of the combined therapy patients obtained that goal, and 70% of the primary thrombectomy patients obtained that goal, with an odds ratio of 1.11, but once again, it was not statistically significant.

The collaboration concluded that thrombectomy alone reached the definition of noninferiority compared to combined therapy, but the lack of significance at every endpoint makes that conclusion debatable. ■

Thrombectomy for Anterior Circulation Stroke Beyond Six Hours from Last Known Well

SOURCE: Jovin TG, et al. LB-8: Thrombectomy for anterior circulation stroke beyond 6 hours from time last known well: Final results of the AURORA (Analysis of Pooled Data from Randomized Studies of Thrombectomy More than 6 hours after Last Known Well) collaboration. Presented at the International Stroke Conference, March 17-19, 2021.

Most guidelines that address the treatment of acute ischemic stroke stress the importance of the six-hour window after onset of symptoms as the time for eligibility for endovascular treatment for all patients who present with large vessel occlusion. Strong evidence now exists for endovascular therapy up to 24 hours in highly selected patients using advanced imaging to identify those who have at-risk brain tissue that can be salvaged, based on perfusion/infarct mismatch criteria.

The AURORA collaborators pooled all patients (n = 505) randomized beyond six hours from last known time well, from six trials that used

effective thrombectomy devices to treat anterior circulation proximal large vessel occlusion ischemic strokes (DAWN, DEFUSE, ESCAPE, REVASCAT, RESILIENT, and POSITIVE). A pooled analysis of individual patient data allowed for greater precision in the estimation of treatment effects, as well as in the analysis of subgroups. In the pooled analysis, the National Institutes of Health Stroke Scale scores ranged from 13-20 with a median score of 16, and enrolled subjects were restricted to occlusions of the intracranial internal carotid artery, or M1 segments. Alberta Stroke Program Early CT (ASPECT) scores ranged from 7 to 9. The primary endpoint was the ordinal modified Rankin Scale score or shift analysis at 90 days, which also was collected in the named studies. Patients were excluded if they had an ASPECT score of < 5. The baseline characteristics of the intervention group and the controls were well matched. The median time from arrival to puncture was 11 hours and time to reperfusion was 12 hours. There were no significant differences between the intervention group and the control group in rates of symptomatic intracerebral hemorrhage or mortality at 90 days.

The primary outcome, a positive shift in the modified Rankin Scale score at 90 days, was confirmed with an adjusted odds ratio of 2.54, $P < 0.0001$. The number needed to treat to see a benefit was three, indicating a strong positive benefit for endovascular thrombectomy after six hours. There was a 20% improvement in the modified Rankin Scale score in the intervention group compared to the control group. A stronger treatment effect was noted in the group of patients treated in the 12- to 24-hour time epoch, compared to the six- to 12-hour time epoch. The effectiveness of thrombectomy was maintained across all subgroups, including those without a defined motor presentation, such as wake-up vs. witnessed stroke, if they had an ASPECT score of 7 or higher. ■

Racial and Ethnic Disparities in the Use of Endovascular Therapy for Ischemic Stroke

SOURCE: Sheriff F, et al. LB-9: National temporal trends in endovascular therapy (EVT) utilization and outcomes according to race and ethnicity: Findings from Get With The Guidelines (GWTG)-Stroke. Presented at the International Stroke Conference, March 17-19, 2021.

Since the publication of multiple clinical trials in 2015 demonstrating benefit, endovascular therapy has increased rapidly as definitive treatment for large vessel occlusion with ischemic stroke. Disparities in the use of acute stroke

diagnostic tools and therapies according to race and ethnicity have been reported previously for many years. This review of the Get With The Guidelines (GWTG) data set was undertaken to determine if the use of endovascular therapy after 2015 has narrowed these disparities. The investigators included all acute ischemic stroke patients who met time and severity eligibility criteria for endovascular therapy (arrival < 6 hours, National Institutes of Health Stroke Scale score [NIHSS] > 6). The data were collected from 2012 until 2019 from the GWTG stroke database. Associations between race/ethnicity, thrombectomy use, discharge disposition, and 90-day modified Rankin score were evaluated and compared before and after 2015.

There were 302,965 potentially eligible patients and 42,422 underwent endovascular thrombectomy. Thrombectomy use increased over time in all racial and ethnic groups. However, Black patients had a reduced odds of thrombectomy use compared to non-Hispanic white patients (odds ratio [OR] before 2015 = 0.68; OR after 2015 = 0.83, $P = 0.02$). Minority patients had a more favorable short-term outcome after 2015. In-hospital mortality or discharge to hospice was less frequent in Black, Hispanic, and Asian patients compared to non-Hispanic whites. Discharge to home was more frequent in Hispanic, Asian, or Black patients compared to non-Hispanic whites. However, three-month functional independence occurred less frequently in Black and Asian patients compared to non-Hispanic whites.

In conclusion, in this large cohort of thrombectomy-treated patients, disparities in the use of thrombectomy across racial and ethnic populations has improved significantly but still exists to some degree. Discharge-related outcomes were more favorable in minorities, but three-month outcomes were worse. The implication is that disparities have been reduced significantly for hospital care, but after discharge, community and home care disparities continue to result in worse outcomes for minority groups. ■

Ischemic Stroke in Patients with COVID-19

SOURCE: Srivastava PK, et al. Acute ischemic stroke in patients with COVID-19. An analysis from Get With The Guidelines–Stroke. *Stroke* 2021; Mar 17. doi: 10.1161/STROKEAHA.121.034301. [Online ahead of print].

Since the first cases of COVID-19 were reported in the United States in February 2020, severe ischemic strokes also have been reported

in some of these patients, some with large vessel occlusions and case reports of thrombectomy for treatment. Get With The Guidelines–Stroke is the largest national stroke registry that has been collecting data at 2,000 U.S. hospitals for many years, and the investigators queried the database to assess the frequency, risk factors, and severity of acute ischemic stroke (AIS) in COVID-19 patients across the country. From Feb. 4, 2020, until June 29, 2020, they identified 41,971 patients with AIS and identified 1,143 who had AIS in the setting of COVID-19 infection. They compared them with AIS patients who did not have COVID-19.

Patients who had both AIS and COVID-19 were younger, or likely to be Black, Hispanic, or Asian rather than white, or more likely to have a higher National Institutes of Health Stroke Scale score, and a higher proportion had large vessel occlusions. Door-to-computed tomography time, door-to-needle time for thrombolysis, and/or to endovascular therapy times were longer in the AIS/COVID-19 cohort compared to the control group.

In a risk-adjusted model, patients who had AIS/COVID-19 had decreased odds ratio of discharge with the modified Rankin Scale score ≤ 2 and had an increased risk of in-hospital mortality. Patients who had ischemic stroke in the setting of COVID-19 were younger, had greater stroke severity, had longer wait times for evaluation and treatment, and had worse morbidity and mortality compared to those without COVID-19. ■

The COVID-19 Pandemic Resulted in Adverse Outcomes for Acute Stroke Care

SOURCE: Balucani C, et al. Exploring the collateral damage of the COVID-19 pandemic on stroke care: A statewide analysis. *Stroke* 2021; Mar 11. doi:10.1161/STROKEAHA.121.034150. [Online ahead of print].

With the rapid explosion of COVID-19 cases in the spring of 2020, many of us observed a decline in emergency department arrivals for patients with acute stroke. Patients were fearful of coming to the hospitals and remained at home unless they were severely affected with other medical issues.

This study was a survey in the state of Maryland of the effect of COVID-19 on stroke admissions and treatment during the pandemic. A retrospective analysis of quality improvement data reported by stroke centers to the state of Maryland was reviewed for the number of admissions for

stroke and stroke type, as well as reported treatments, between March 1 and Sept. 30, 2020, and compared to the same time interval in 2019. The last known time well and arrival to the hospital, as well as the frequency of treatment with intravenous thrombolysis and thrombectomy, also were evaluated and compared.

During the initial seven months of the pandemic, from March through September, there were 6,529 total admissions for stroke and transient ischemic attack (TIA), for a monthly mean of 938. During the same time interval in 2019, there were 8,003 admissions, for monthly mean of 1,156.

There was a significant decrease in the use of intravenous thrombolysis, with 617 instances during the pandemic vs. 805 in the previous year, but no significant decrease for thrombectomy. The pandemic decreased the probability of admission for stroke and TIA by 19%, acute ischemic stroke by 20%, and the number of cases of intravenous thrombolysis by 23%. There were no differences in admissions for subarachnoid hemorrhage.

The viral pandemic had a severe adverse effect on stroke care because patients who were mildly affected did not come to the hospital for care. The long-term consequences of this change in behavior has yet to be assessed and evaluated. ■

Stroke and Risk of Suicide

SOURCE: Vyas MV, et al. Association between stroke and subsequent risk of suicide: A systematic review and meta-analysis. *Stroke* 2021;52:1460-1464.

The development of depression following stroke is common, and ranges from 28% to 35% in prospective cohort studies. Depression and low

mood have been associated with suicidal ideation, but factors such as cognitive impairment and physical disability also may increase the risk of suicidal ideation in survivors of stroke.

The investigators conducted a systematic review of the literature to perform a meta-analysis of observational studies and determine the prevalence and risk of attempted suicide in patients who survive and recover from stroke. Using key words, they systematically searched multiple literature databases and selected observational studies that reported suicide attempts or deaths by suicide in stroke survivors. They then defined a comparison group consisting of people without a history of stroke or the general population. They used random effects meta-analysis and calculated the pooled adjusted risk ratio of suicide in stroke survivors and calculated the pooled risk ratio of suicide attempt and death by suicide.

A total of 4,093 articles were screened with 23 studies of fair quality totaling more than 2 million stroke survivors. Of those, 5,563 attempted suicide or died by suicide. Compared to the non-stroke group, the risk ratio for suicide or attempted suicide in stroke survivors was 1.73, $P = 0.03$. The risk of attempted suicide was higher than death by suicide when compared to the non-stroke population. The investigators noted that in patients who were followed in cohort studies, the risk of suicide was lower for every one year of increase in follow-up.

Stroke should be considered a risk factor for suicide, and strategies to screen and treat depression and suicidal ideation should be an important component of long-term follow-up and care for stroke patients. ■

ABSTRACT & COMMENTARY

Pitfalls in the Diagnosis of CIDP

By *Michael Rubin, MD*

Professor of Clinical Neurology, Weill Cornell Medical College

SYNOPSIS: Chronic inflammatory demyelinating polyradiculoneuropathy is commonly misdiagnosed. It is important to adhere to established diagnostic criteria and to regularly re-evaluate all patients given this diagnosis.

SOURCE: Broers MC, et al. Misdiagnosis and diagnostic pitfalls of chronic inflammatory demyelinating polyradiculoneuropathy. *Eur J Neurol* 2021; Mar 3. doi: 10.1111/ene.14796. [Online ahead of print].

With a prevalence of five cases per 100,000, and an incidence that increases with advancing age, chronic inflammatory demyelinating polyradiculoneuropathy (CIDP) is a male-predominant, motor-predominant, symmetric

neuropathy with no clearly identified predisposing risk factors and no genetic predisposition. Characterized by a progressive or relapsing-remitting course and symmetric proximal and distal muscle weakness, asymmetric and sensory forms also

are recognized. Although thought to be immune mediated, the cause remains unknown. More than 15 sets of diagnostic criteria have been outlined, underscoring the challenge of correct diagnosis. Misdiagnosis is not uncommon. What factors underlie an erroneous diagnosis of CIDP? How can this be avoided?

Clinical, electrodiagnostic, laboratory, and treatment data were retrospectively collected on all patients referred to Erasmus University Medical Center Rotterdam, with a referral or final diagnosis of CIDP, between April 2011 and March 2017. Recognized as a Center of Excellence for Guillain-Barré syndrome (GBS) and CIDP, this tertiary academic hospital keeps an internal CIDP database, which was reviewed to ensure capture of all eligible patients. Data included electrodiagnostic studies, serum paraprotein and immunoglobulin M (IgM) antibody to myelin-associated glycoprotein (anti-MAG Ab), cerebrospinal fluid (CSF) analyses, magnetic resonance imaging (MRI) of spinal roots and lumbosacral plexus, nerve ultrasound, and nerve biopsy.

European Federation of Neurological Societies/Peripheral Nerve Society (EFNS/PNS) 2010 diagnostic criteria for CIDP were used to define patients as “definite,” “probable,” or “possible” CIDP, and all patients were classified as CIDP confirmed, CIDP underdiagnosed, or CIDP overdiagnosed. Statistical analysis comprised the Chi-square or Fisher’s exact test and the Mann-Whitney U test, with *P* values < 0.05 considered significant.

Among 122 patients referred with either a diagnosis of CIDP or a different diagnosis revised to CIDP, 10 were excluded for various reasons, including lack of diagnostic consensus, leaving 112 for analysis. Among 96 patients with a referral diagnosis of CIDP, the diagnosis was confirmed in 65 (68%), but revised in 31 (32% overdiagnosis), whereas among 81 patients ultimately diagnosed with CIDP at Erasmus University, 16 were referred with an alternative diagnosis (20% underdiagnosed). Age and gender were similar in all groups, but misdiagnosis was significantly more common when referral came from a non-teaching hospital.

Among the 31 overdiagnosed patients, almost all (*n* = 30) were diagnosed with another form of neuropathy and, compared to the CIDP-confirmed group, they were more likely to have asymmetric muscle weakness (20% vs. 5%) or purely distal weakness (29% vs. 11%), and less likely to have

proximal weakness (52% vs. 86%). Failure to fulfill electrodiagnostic criteria for CIDP was found in 65%, and, although all overdiagnosed patients had neuropathy other than CIDP, 74% showed elevated CSF protein.

Among the underdiagnosed, 50% had clinically atypical CIDP, including predominantly distal or asymmetric phenotypes, all had proximal muscle weakness when seen at Erasmus, all fulfilled CIDP electrodiagnostic criteria, and 25% had elevated CSF protein.

[Systemic symptoms and pain should raise suspicion for chronic inflammatory demyelinating polyradiculoneuropathy mimics. Patients should be reassessed and re-evaluated regularly for alternative diagnoses.]

Errors in CIDP diagnosis are common in both directions and may be explained by a variety of factors, including unawareness that proximal muscle weakness is characteristic of CIDP, unawareness of atypical CIDP phenotypes, erroneous interpretation of electrodiagnostic studies, nonadherence to accepted CIDP electrodiagnostic criteria, overreliance on CSF protein levels, and failure to exclude other causes of polyneuropathy.

■ COMMENTARY

Even among patients satisfying EFNS/PNS 2010 diagnostic criteria for CIDP, misdiagnosis may occur. Among seven such patients reported in a case series of CIDP mimics, five ultimately were diagnosed with POEMS (polyneuropathy, organomegaly, endocrinopathy, M protein, skin changes), and one each with neurolymphomatosis or chronic ataxic neuropathy ophthalmoplegia IgM paraprotein cold agglutinins disialosyl antibodies (CANOMAD). Neuropathic pain and leg swelling (*n* = 6) or significant weight loss (*n* = 4) were common, all had a monoclonal protein, most had elevated levels of vascular endothelial growth factor (VEGF), and some responded to steroids or intravenous immunoglobulin.

Be not fooled. Systemic symptoms and pain should raise suspicion for CIDP mimics. Patients should be reassessed and re-evaluated regularly for alternative diagnoses. ■

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CME OBJECTIVES

Upon completion of this educational activity, participants should be able to:

- discuss current scientific data regarding the diagnosis and treatment of neurological disease;
- discuss the pathogenesis and treatment of pain;
- describe the basic science of brain function;
- discuss new information regarding new drugs for commonly diagnosed neurological conditions and new uses for traditional drugs;
- identify nonclinical issues of importance for the neurologist.

CME QUESTIONS

1. In patients with ischemic stroke and large vessel occlusions, direct transfer to the angiography suite speeds up the time to reperfusion and results in better outcomes.
a. True
b. False
2. The benefit of mobile stroke units is explained by the high rate of successful thrombolysis during the first 60 minutes (the golden hour) after the onset of stroke symptoms.
a. True
b. False
3. Endovascular thrombectomy without intravenous thrombolysis has been proven to result in better outcomes than using combined therapy.
a. True
b. False
4. Endovascular thrombectomy beyond six hours after last known time well is hazardous and not beneficial for patients with acute ischemic stroke.
a. True
b. False
5. In recent years, racial and ethnic disparities in stroke care have been eliminated.
a. True
b. False
6. Patients with COVID-19 and ischemic stroke have higher morbidity and mortality from their stroke.
a. True
b. False
7. The risk of suicide following a stroke cannot be prevented.
a. True
b. False
8. Which of the following statements regarding chronic inflammatory demyelinating polyradiculoneuropathy (CIDP) is correct?
a. CIDP usually is predominantly distal.
b. CIDP usually is asymmetric in its distribution of weakness.
c. CIDP usually is associated with pain.
d. CIDP is motor predominant and more common in older men.

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