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THE PRESENT AND FUTURE

REVIEW TOPIC OF THE WEEK

Proposed Standardized Neurological Endpoints for Cardiovascular Clinical Trials

An Academic Research Consortium Initiative

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ABSTRACT

Surgical and catheter-based cardiovascular procedures and adjunctive pharmacology have an inherent risk of neurological complications. The current diversity of neurological endpoint definitions and ascertainment methods in clinical trials has led to uncertainties in the neurological risk attributable to cardiovascular procedures and inconsistent evaluation of therapies intended to prevent or mitigate neurological injury. Benefit-risk assessment of such procedures should be on the basis of an evaluation of well-defined neurological outcomes that are ascertained with consistent methods and capture the full spectrum of neurovascular injury and its clinical effect. The Neurologic Academic Research Consortium is an international collaboration intended to establish consensus on the definition, classification, and assessment of neurological endpoints applicable to clinical trials of a broad range of cardiovascular interventions. Systematic application of the proposed definitions and assessments will improve our ability to evaluate the risks of cardiovascular procedures and the safety and effectiveness of preventive therapies. (J Am Coll Cardiol 2017;69:679–91) © 2017 The Authors. Published by Elsevier Inc. on behalf of the American College of Cardiology Foundation. All rights reserved.

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ABBREVIATIONS AND ACRONYMS

CNS = central nervous system

DWI = diffusion-weighted imaging

MRI = magnetic resonance imaging

mRS = modified Rankin scale

NeuroARC = Neurologic Academic Research Consortium

Stroke is among the most feared complications of surgical and transcatheter cardiovascular interventions, affecting both benefit-risk evaluations and health care costs (1-6). The primary mechanism of procedure-related stroke is focal or multifocal embolization during cardiovascular instrumentation or surgical manipulation; diffuse cerebral hypoperfusion from sustained or profound procedural hypotension (i.e., global hypoxic ischemic injury) is a less common cause. The ongoing risk of spontaneous stroke beyond the periprocedural time frame may be more dependent on patient-related risk factors, although late device-related complications are also a concern (7,8). Clinical manifestations of periprocedural stroke are highly variable and substantially under-reported, and systematic evaluations by neurologists commonly uncover more subtle, but nonetheless clinically significant, neurological deficits (6,9-12). Routine neuroimaging has revealed that "silent" ischemic cerebral infarcts are common after a wide range of procedures (9,13), although their clinical significance and association with subsequent cognitive decline and future stroke remains incompletely characterized (14,15). Because such infarcts are estimated to affect 600,000 patients annually in the United States alone (16), a better understanding of their clinical implications, and the role of imaging and cognitive measures in device and procedural evaluations, is necessary. The Neurologic Academic Research Consortium (NeuroARC) is an international collaboration convened to propose sensitive but pragmatic definitions and assessments for neurological injury relevant to cardiovascular interventions.

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