

The cardio-vascular future of panvascular medicine: the basics

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Finish the unfinished work,
otherwise
the unfinished work
will finish you.

Amit Kalanti, born 1988

Despite extensive research and ongoing organizational efforts, cardiovascular disease remains—and will remain for at least the next 25 years—the leading cause of death, including premature death.^{1,2} Cardiovascular disease also remains the leading cause of disability, with ischemic stroke being the primary cause.² The societal cost of cardiovascular disease is substantially higher than that of cancer, and is predicted to increase even further.² There is no doubt that novel therapies are needed to address the growing cardio-vascular disease burden,¹ but equally pressing is the conduction of well-designed registries that would enable understanding the reasons for suboptimal implementation of many existing therapies.² Today, the knowledge generated from all-comer registries and studies is fundamental.

A significant part of the growing problem with cardiovascular disease lies in the increase in multisite atherosclerotic involvement, known as polyvascular atherosclerotic disease (PVD). In patients with PVD, the risk of death due to cardiac events is doubled compared with those with “isolated” coronary artery disease (CAD).³ These days, in PVD patients, regional lesions that previously garnered attention because of the individual physician’s special field of interest

or expertise, overlap with disease in other territories or organs, which thus all naturally become areas of common medical concern and, if indicated, intervention. Cardiac and vascular surgeons, interventional neurologists, radiologists, angiologists, and cardiologists all address similar pathologies while taking care of these patients with a multilevel disease.³

In the current issue of *Kardiologia Polska* (*Kardiol Pol*), Vlajinac et al⁴ report on the incidence of multisite atherosclerosis in 1045 consecutive patients referred for evaluation of carotid stenosis or peripheral arterial disease. Building on the epidemiology noted in the inaugural report by Aronow and Ahn⁵ quarter of a century ago and then followed by larger-scale registries such as the Reduction of Atherothrombosis for Continued Health (REACH), the data reported by Vlajinac et al⁴ clearly demonstrate that the risk profile of patients with PVD is significantly worse than in those with single-territory atherosclerotic involvement, thus calling for an earlier and more thorough workup of the PVD cohort. As angiographic evaluation and clinical treatment of atherosclerotic disease evolve,⁶ contemporary investigations such as that by Vlajinac et al⁴ are critically needed to monitor and understand new developments in order to adequately address novel challenges.²

The heart is central to PVD not simply because of its anatomic location. Today, patients effectively treated for peripheral arterial disease or cerebrovascular disease can successfully avoid limb amputation or carotid stenosis-related stroke only to experience premature

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death from CAD.^{7,8} Optimal cardiac care, including coronary revascularization, may reduce CAD death in patients with cerebrovascular/peripheral arterial disease,⁷ calling for greater involvement of general and interventional cardiology in managing patients with PVD. Such involvement appears particularly relevant as many patients with cerebrovascular/peripheral arterial disease do not exhibit CAD symptoms due to their reduced mobility and a high prevalence of diabetes.⁷⁻⁹ Because of this, in many cardiology centers, diagnostic workup of CAD (and, if indicated, coronary revascularization) in patients with PVD is already routinely performed.^{8,9}

Easily-applicable, nontroublesome CAD risk screening methods may exist for centers where cerebrovascular or peripheral arterial disease interventions are performed by noncardiologists. According to a recent report, in patients subjected to endovascular interventions for critical limb ischemia performed by an angiologist, a clinically silent periprocedural troponin rise was independently associated with an approximate 2- to 3-fold increase in 1-year mortality.¹⁰ This calls for routine peri-intervention troponin monitoring to trigger swift referrals for CAD evaluation and management, potentially reducing the CAD death risk.⁷

The leading vascular medicine topic of today is acute ischemic stroke (AIS). AIS is not a disease of neurons per se, but rather a vascular disease of the brain, just as critical limb ischemia is a vascular disease of the limb, and renal insufficiency stemming from renal artery stenosis is a vascular disease of the kidney. Manual thrombectomy (MT), the endovascular removal of the clot blocking the major cerebral artery in AIS, is, in patients who qualify, a highly effective treatment (number needed to treat <3) that reduces (and may totally prevent) stroke-related disability and suffering.¹¹ Time to intervention is a key factor determining success in AIS (to an extent far greater than in the acute myocardial infarction [MI]), and one of the worst things that can be done to a patient with AIS is interhospital transportation, particularly if MT facilities already exist in the hospital where the patient originally presents.¹¹ Today, lack of personnel to deliver MT is the primary reason for limited MT availability in European countries with suboptimal AIS management, including Poland,¹² a country that once internationally championed acute MI revascularization networks and developed treatment paradigms.

Cardiology is naturally positioned for AIS management to fill the embarrassing gap between MT needs and current delivery^{12,13} for a number of reasons¹⁴⁻¹⁶ including: 1) the role of cardiology in primary and secondary AIS prevention (such as pharmacologic and interventional management of atrial fibrillation to note arrhythmic substrate ablations, patent

foramen ovale closure, left atrial appendage occlusion, or neuro-protected carotid artery stenting); 2) the “no-delay” mindset of interventional cardiologists that they developed with primary angioplasty in acute MI, and their true 24/7/365 operating hours schedule; and 3) the “en route to the brain” skills and expertise of those particular interventional cardiologists who already perform, with low complication rates, complex neuroprotected cephalic artery interventions. Although MT is essentially similar to coronary thrombus aspiration in acute MI, it needs to be fully understood and appreciated that the brain is not the heart, the cerebral arteries are not epicardial, and AIS is not an acute MI.^{11,14,16} While those interventional cardiologists (along physicians of other vascular specialties such as vascular surgery and interventional angiology) with a high level of neuroprotected carotid artery stenting skills still require additional training to perform AIS-MT,^{12,15} the MT training of interventional cardiologists skilled in coronary artery manual thrombus aspiration and in neuroprotected carotid artery stenting takes approximately 3 months, whereas it takes around 3 to 4 years of instruction and experience to fully train someone with no endovascular skills to become a neurointerventionalist (providing the person turns out capable of acquiring such skills). Cardiac cathlab-based MT-capable centers working under the guidance of current international AIS guidelines (cf, thrombectomy-capable centers in parallel to comprehensive stroke centers¹⁷); have AIS-MT results similar to the “classic” neurointerventional centers.^{18,19} Unfortunately, even if cardiologists are properly trained and are part of an already established collaboration program with a local stroke unit, they often face political obstructions and territorial turf issues from other specialties, including interventional radiology, neurosurgery, and neurology.¹⁴ The latter is especially incongruous given most neurologists are noninterventionalists, have no desire to become such, and their prime concern should be the fate of the stroke patients who come to their attention in acute clinical setting.^{14,16}

In conclusion, the heart is central to pan-vascular medicine not only anatomically but also logistically, and, of course, prognostically.^{7,8,11} Cardiology provides a range of established processes from prevention and utilizing evidence-based and patient-centered pharmacotherapy to the expertise and infrastructure to perform elective and emergent skilled endovascular interventions. Cardiologists, along other endovascular interventionalists, intervene caudally from the heart towards the kidneys, centrifugally to the lower and upper extremities, and cephalically to the brain. One high-level professional

organization that consequently implements multispecialty inclusive policies and develops integrated guidelines that involve vascular surgeons, angiologists, stroke physicians, diabetologists, and others is the European Society of Cardiology. This is an attitude increasingly adopted by others such as the American Heart Association / American Stroke Association. In a growing number of vascular centers, cardiology effectively brings together different specialties at the bedside and in the operating room.¹⁵ Also, there are some very important initiatives of cardiology physicians such as the FRIENDS (Finalised Research in Endovascular Strategies) initiative that uplifts the every-day multispecialty collaboration at the level of an individual patient care to the level of clinical studies that generate new panvascular knowledge to guide patient management.³

The shortage of interventionalists capable of rapidly treating patients with stroke constitutes a critical bottleneck contributing to a severe public health problem.^{13,14} This and other barriers in our healthcare systems, including the (sadly) human-generated ones (note some continued attempts to decide who “can” and who “cannot” or who “should” and who “should not” perform a particular type of endovascular intervention)¹⁴⁻¹⁶ produce, in case of AIS, ever more severely disabled patients. Interventional cardiologists, and especially those already skilled in accessing and treating supra-aortic anatomy, are currently—according to patient-centered neuroradiology key opinion leaders—best-positioned tactically and strategically to achieve rapid intervention for AIS nationwide.^{14,16} Hampering their involvement is a detriment to individual and public health.

Creation of multispecialty stroke referral and management networks including (consistent with international guidelines such as the American Stroke Association guidelines¹⁷) establishment of interventional cardiology cathlab-based MT-capable centers working in a close collaboration with local stroke units, remains an unfinished job.^{14,16} This unfinished work, in many countries (including Poland),¹² translates into a continued and systematic production of preventable invalids in place of people enjoying normal (or nearly-normal) lives after a timely and effective MT.

ARTICLE INFORMATION

DISCLAIMER The opinions expressed by the author are not necessarily those of the journal editors, Polish Cardiac Society, or publisher.

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