Cardiovascular Revascularization Medicine 20 (2019) 630–631

Contents lists available at ScienceDirect

Cardiovascular Revascularization Medicine

Race and Outcomes after Endovascular Intervention: Can We Improve Outcomes for All?

Ehrin J. Armstrong *, Paul J. Lee

Division of Cardiology, University of Colorado, United States of America

ARTICLE INFO

Article history:
Received 30 May 2019
Accepted 30 May 2019

Recent advancements in the endovascular treatment of peripheral artery disease (PAD) have led to significant improvements in quality of life, reduction in limb pain, and reduced amputation rates among patients with critical limb ischemia [1,2]. Over the past decade, endovascular procedures have increased significantly, with concomitant reduction in need for surgical bypass and overall trends towards a reduction in major amputation rates [3]. Despite progress, racial disparity in peripheral artery disease management and outcomes has been a persistent phenomenon over the past several decades.

PAD is more prevalent in black patients, which is in keeping with the overall increased cardiovascular disease burden in the same population [4,5]. There are multiple reasons for the increased prevalence of PAD, including prevalence of comorbidities, access to care, likelihood of seeking care, and likelihood of disease identification by physicians. Black patients are more likely to present with CLI as their initial presentation of PAD (73% vs 62%), and rates of major amputation are significantly higher when compared to the white patients [6]. Despite advancements in revascularization procedures, black patients receive these procedures at an inexplicably lower rate compared to their white counterparts (OR 0.72), even after adjusting for individual patient characteristics [7]. That said, even in patients who do receive limb-salvage interventions, the outcomes are similarly worse: black patients are also at an increased risk for 30-day bypass graft failure [8] and an increased risk of amputation after endovascular intervention [9].

The study published in this issue of Cardiovascular Revascularization Medicine by Alassad and colleagues aims to re-evaluate the racial disparity in outcomes in patients with high-risk popliteal and infrapopliteal lesions who presented with claudication or CLI. This study was performed with a single center, retrospective design with a total of 696 patients (37.8% black) who underwent either laser or balloon angioplasty with a mean follow up of 36 months. The demographic data revealed that black patients were younger and had a higher prevalence of comorbidities, including higher BMI, hemoglobin A1c, end-stage renal disease and hypertension. In keeping with prior studies, black patients were less likely to have a history of prior bypass, and more distal branches involved. Despite this, the authors reported that the post-intervention outcomes between the black and white patients were similar if not superior in the black cohort. In contrast to prior reports, there were no significant differences in amputation rates (4.2% vs. 4.4%), all cause mortality (28.9% vs. 32.1%), and repeat revascularization with surgical bypass rate (1.5% vs. 1.7%). In fact, the composite of repeat revascularization and MAVE was found to be lower in the black cohort. This is in direct opposition to prior studies that demonstrated worse outcomes of revascularization in black when compared to white patients [8,9]. Although the prior studies focused mainly on the infra-inguinal disease compared to the present study with infra-popliteal disease, other factors likely account for the differences in results with this study.

There are several key limitations inherent to this study design that should be acknowledged. Being a single center study, it underestimates the heterogeneity of the overall patient population. Compared to similar studies examining racial disparities in PAD outcomes, the sample size of this study is therefore much smaller. In addition, the single center study design inevitably minimizes the effect of pre- and peri-procedural variation in the level of care that may occur at other institutions. To this effect, using the data from the Vascular Quality Initiative, O'Donnell and colleagues reported a wide variation in outcomes between black and white patients throughout the United States [10]. This study, however, raises an important point that experienced centers can achieve excellent outcomes in high-risk patients. Despite the more severe disease as evidenced by distal arterial involvement and outcome-modifying comorbidities, black patients faired equally well, if not better, with revascularization therapy when compared to white patients, indicating that revascularization therapy is a viable option for what may have been previously regarded as a non-salvageable limbs.

Future research and studies should focus not only on further delineating the root causes of racial disparities in PAD presentation and outcomes after revascularization, but also on collecting evidence-based data on the outcomes of novel techniques for development of robust guidelines to apply to all populations equally. Care models that include multidisciplinary vascular teams are an important way forward to delivering care equally and effectively [11]. These teams would consist not only of vascular specialists, but also key adjunct services such as endocrinology, infectious disease, wound specialists, and prosthetics to aid

* Corresponding author at: Rocky Mountain Regional VA Medical Center, 1700 N Wheeling St, Aurora, CO 80045, United States of America.
E-mail address: Ehrin.armstrong@gmail.com (E.J. Armstrong).

https://doi.org/10.1016/j.carrev.2019.05.031

in the management of this complex disease. Further, such teams encourage comprehensive multidisciplinary care and can help standardize treatment. Additionally, increased community outreach and education are necessary to raise awareness, promote lifestyle modification, and improve medical management of at-risk populations. With these efforts, we can standardize care and improve outcomes for all patients with PAD.

References

[1] Murphy TP, Cutlip DE, Regensteiner JG, Mohler ER, Cohen DJ, Reynolds MR, et al. Supervised exercise versus primary stenting for claudication resulting from aortoiliac peripheral artery disease: six-month outcomes from the Claudication: Exercise Versus Endoluminal Revascularization (CLEVER) study. Circulation 2012;125:130–9.

[2] Agarwal S, Sud K, Shishehbor MH. Nationwide trends of hospital admission and outcomes among critical limb ischemia patients: from 2003–2011. J Am Coll Cardiol 2016;67:1901–13.

[3] Goodney PP, Beck AW, Nagle J, Welch HG, Zwolak RM. National trends in lower extremity bypass surgery, endovascular interventions, and major amputations. J Vasc Surg 2009;50:54–60.

[4] Selvin E, Erlinger TP. Prevalence of and risk factors for peripheral arterial disease in the United States: results from the National Health and Nutrition Examination Survey, 1999–2000. Circulation 2004;110:738–43.

[5] Carnethon MR, Pu J, Howard G, Albert MA, Anderson CAM, Bertoni AG, et al. Cardiovascular health in African Americans: a scientific statement from the American Heart Association. Circulation 2017;136:e393–423.

[6] Soden PA, Zettervall SL, Deery SE, Hughes K, Stoner MC, Goodney PP, et al. Black patients present with more severe vascular disease and a greater burden of risk factors than white patients at time of major vascular intervention. J Vasc Surg 2018;67:549–56.

[7] Holman KH, Henke PK, Dimick JB, Birkmeyer JD, et al. Racial disparities in the use of revascularization before leg amputation in Medicare patients. J Vasc Surg 2011;54:420–6.

[8] Nguyen LL, Hevelone N, Rogers SO, Bandyk DF, Clowes AW, Moneta GL, et al. Disparity in outcomes of surgical revascularization for limb salvage: race and gender are synergistic determinants of vein graft failure and limb loss. Circulation 2009;119:123–30.

[9] Loja MN, Brunson A, Li CS, Carson JG, White RH, Romano PS, et al. Racial disparities in outcomes of endovascular procedures for peripheral arterial disease: an evaluation of California hospitals, 2005–2009. Ann Vasc Surg 2015;29:950–9.

[10] ODonnell TFX, Powell C, Deery SE, Darling JD, Hughes K, Giles KA, et al. Regional variation in racial disparities among patients with peripheral artery disease. J Vasc Surg 2018;68:519–26.

[11] Armstrong EJ, Alam S, Henao S, Lee AC, DeRubertis BG, Montero-Baker M, et al. Multidisciplinary care for critical limb ischemia: current gaps and opportunities for improvement. J Endovasc Ther 2019;26:199–212.