



American
Heart
Association

Transcript Webinar 2

Treating Peripheral Artery Disease in Underserved Communities

Intro

Hello and welcome to the Peripheral Artery Disease Webinar about Community to help train those who serve the underserved. I am Antonio Gutierrez, an interventional cardiologist at Duke University Hospital. Peripheral artery disease affects more than 200 million adults worldwide, and over 8.5 million in the US. While it is a serious risk factor for coronary artery disease and cerebrovascular disease, PAD remains a largely overlooked condition, but together we can change that. Janssen pharmaceuticals is a proud sponsor of the American Heart Association's efforts to educate healthcare practitioners about peripheral artery disease. So let's go ahead and get started. I would like to give a very huge shout out and thank you to Dr. Amy West Pollak who was a key contributor in the making of these slides and the content of this webinar. Our target clinical audience is registered nurses, nurse practitioners, physician assistants, and general practitioners. Here are the webinar objectives.

Objectives

We want to recognize social determinants of health for PAD.

We're going to give examples of key social determinants for PAD. We're going to specifically talk about age, ethnicity, economic status, education and health literacy. Please know that these are not the only social determinants for PAD. They are the ones that we're going to focus on during this webinar. We're going to use social determinants to assess for PAD. We're going to determine key risk factors for PAD using a patient case. Lastly, we're going to construct goals for improving identification, of PAD within your community.

Sample Case

Now onto our patient case. We have a 78 year old African American female with coronary artery disease, diabetes mellitus type II, hypertension and hyperlipidemia who presents with right lower extremity pain with ambulation. She reports that she can walk 20 yards when she starts to get the pain in her right calf. She denies any chest pain while ambulating and occasionally has pain in her right foot at rest.

Now, the patient was initially evaluated by podiatry for evaluation of plantar fasciitis as a possible cause of her symptoms. After determining that this was not the etiology of her leg pain,

she was then referred to orthopedic surgery for evaluation of sciatic nerve pain. After determining this was not the cause of her symptoms. She was directed to her primary care physician to evaluate for other causes of leg pain with ambulation. It wasn't until six months following her symptom onset, she was finally referred to us at vascular medicine. At home, the patient takes aspirin, clopidogrel, enalapril, atorvastatin and metformin. Her labs: her LDL is 1:30, HDL is 32, her hemoglobin A1C 7.5, and she has a normal serum creatinine. In regards to her family history, her father had coronary artery disease. Her mother had diabetes. She is widowed and unemployed. She's a former smoker and did not attend high school. As part of her initial workup, we went ahead and performed lower extremity brachial indices. Here's the initial data, and we will teach you what you need to know regarding this data and how to interpret it.

The Ankle-Brachial Index

Now remember the diagnosis of PAD can be made with an ankle brachial index and you do this by taking the ankle systolic pressure at the highest one, per respective foot and dividing it by the brachial systolic pressure – the highest one of the upper two arms. Know that a normal ABI from 1.0 to 1.4, abnormal is 0.9 or less giving you a diagnosis of PAD. Borderline is 0.9 to 0.99 and an ABI of of 1.4 is indeterminate and is believed to be secondary to non-compressible vessels. This would be a good time to go ahead and start discussing the PAD risk in communities. It's important to note that the ascertainment of PAD really needs to be considered in the setting of the PAD critical burden within your local practice and community.

PAD and Social Determinants of Health

Now this is where we get into the focus of our webinar in regards to social determinants of health and PAD.

Age and PAD

The first social determinant or we're going to focus on is age.

We have a standardized annual prevalence of PAD on the y axis over a 10 year period from 2003 to 2012. We've divided our cohorts into two groups. In blue, we have those aged 65 to 74 and we have in red those greater than or equal to 75 years and which you can see for each year the prevalence of PAD and those greater than or equal to 75 is at least twice that of those 65 to 74 years. On this figure, we have data over 3.6 million patients ages 40 or older. This study cohort consists primarily a self referred individuals who pay for vascular screenings tests out of pocket. The screenings were performed in 2003 to 2008 over 20,000 US sites. On the y axis, again, we have our prevalence and on the x axis we have age in deciles from 40 increasing as it moves to

the right. And what you can see is that there is an exponential increase in the prevalence of PAD with the older populations and you can see that it's around the age of 70, that really the prevalence of PAD begins to increase acutely. I use this in my clinic knowing that the older patient I see, I'll be thinking about back of my mind, "Oh, their symptoms very likely could be PAD."

Ethnicity and PAD

Our next social determinant is ethnicity. Here we have data from the San Diego population study. It's a multiethnic population of employees at UCSD, about 2300 patients which you can see on the y axis is the prevalence of PAD on the left and on the x axis we have our ethnic groups of non-Hispanic whites, black, Hispanic, and Asian, in which you can clearly see that the prevalence of PAD was greatest among blacks. It's important to note that a multiple logistic regression analysis was used to adjust for differences in key baseline variables such as education and occupational status, diabetes, hypertension, medication use and BMI. And what you can see after adjustment, that the odds ratio for having PAD was significantly higher among black with a consistently significant odds ratio of 2.34. Now the San Diego study was a small population, so in this figure which you see is a Meta analysis that was recently published that includes studies reporting PAD prevalence in general or diabetic populations and compares PAD prevalence among ethnic groups.

On the y axis you have a prevalence again, and on our x axis we have our ethnic groups of whites, blacks, east, Asians, and South Asians, which you can see once again that blacks have the highest prevalence of PAD. So what you can see from our previous two slides is that we know that blacks have a high prevalence of PAD. Unfortunately, as a healthcare community, we have not done a very good job at improving these numbers. Here we have Medicare data from 2007 to 2011 identifying patients through ICD-9 codes who have PAD and diabetes. You can see that the years are depicted in the first row up top and you can see that the total number of patients versus each year's, it's anywhere from 2.9 to 3.4 million patients, which you can see for non-blacks start off at 88.5 percent in 2007 and the prevalence decreases to 88 percent for blacks.

Unfortunately it starts off at 11.5 percent in 2007 and the number increases to 12 percent in 2011. Now you might not think .5 of a percent is not that much, but we're talking about 2.9 to 3.4 million patients so that .5 of a percentage point actually comes out to about 50,000 patients. So I know that when I see one of my patients who's African American, I try to do everything I can to make sure that their symptoms are not secondary to PAD. It's important to note that when you're seeing patients, despite their ethnic background, you need to take the area where you're seeing your patients in the United States into consideration. Here we have data from the healthcare cost and utilization project. It's a national inpatient database looking at patient visits

from 2016 to 2013 and what you can see that if you're seeing patients in the southeastern United States, this is a good chance that that if they're having claudication, their symptoms may be secondary to PAD.

What you can see here is that the highest rates of PAD among African Americans are in the southern USA, and this is nicely depicted in this following heat map. Here this is data from Medicare files from 2007 to 2010 identifying patients with PAD and diabetes, using ICD-9 codes, which you can see that the darker colors depict leg amputation per 1000 Medicare beneficiaries, and the darker colors represent higher rates of amputation. I keep this in mind when I see my patients because as previously mentioned, you can see the southern United States is a hotbed for amputations among patients with PAD. Being located in North Carolina, I keep this in mind every time I see my patients and I'm considering PAD as a cause of their symptoms, which is why I want to get them treated as soon as possible. Now, it's important when it comes to ethnicity and PAD, that outcomes are affected by one's ethnic background.

Here we have data from Medicare files 2007 to 2010, which you can see on the y axis. We have amputation-free survival, the two figures depict amputations and re-interventions according to being black or non-black and what you can see that non blacks tend to have a better amputation-free survival following their initial procedures. Very similar slide here. We here are depicted our initial procedures of endovascular revascularization versus open revascularization. Again, on the y axis for the left figure, we have intervention free survival. On the x axis, we have a month after vascular procedure which you can see on the left figure that non-blacks again do better than blacks in regards to open revascularization and amputation free survival. In the figure on the right, you can see again, the nonblack tend to have a worse outcome. This next figure is very important.

The two key points here are first being that there is a 37 percent higher amputation risk among blacks compared to those who are whites.

Ethnicity, Income and PAD

However, here in this figure using the national veterans affairs data warehouse, which you can see is that each ethnic group was subdivided by an income. That income cutoff was \$40,000 a year and what you can see that for blacks it did not matter if their income was less or greater than \$40,000 a year. They still have a higher risk compared to white. So now back to our next health determinant: economic status and PAD. Here we have data from the N-HANES which is a series of surveys conducted by the National Center for Health Statistics to Assess the Health and Nutritional status of the US population. In this figure, we have PAD prevalence on the y axis. We have it depicted according to the poverty income ratio.

Here a PIR ratio of less than one indicates a family income below the poverty threshold, and what you can see here is that for the three lowest groups, you have the highest prevalence of PAD. The risk of PAD actually the prevalence is at least two times higher than those with a PIR of 5.0. Here, we have data from the Atherosclerosis Risk In Community study here for survival free rate of PAD hospitalization has been categorized according to income. The incomes are in green greater than or equal to \$25,000 a year, in blue, \$12,000 to \$24,999 a year, and in red, less than \$12,000, which you can see again here is that those with the highest level of income are more likely to avoid a hospitalization secondary to PAD complications. In this slide, we discussed the social economic status, race and major amputation among claudicants. We're using the national veterans affair corporate data warehouse in 2003 to 2014.

Here, our cohorts are patients who are black or white, but they then further subdivided into their income of less than or equal to \$40,000 a year or greater than \$40,000 within each cohort is further subdivided according to key comorbidities of diabetes and chronic kidney disease or end stage renal disease in which you can see within each ethnic group whether or not you made less than or greater than \$40,000, put you at greater risk of amputations for the next three years. Please notice on the y axis that the amputation rates go from zero to six percent. We have a very similar slide here except this time we're looking at critical limb ischemia. What you can see here is when it comes to critical limb ischemia, again, within each group of black and white ethnic background, you can see that if you make less than \$40,000 a year, you have a higher risk of having an amputation within three years, and please notice that here the amputation rates go from zero to 35 percent. You can see that the rates are significantly higher for those who live with critical limb ischemia.

Education and PAD

Our next determinant is education level. We're going to start off by going back with our N-HANES study participants were divided by the highest grade or level of education. It is divided into those who went to less than high school, some college or a college graduate level degree or higher, which you can see that the PAD prevalence is highest in those with less than a high school education. Here we go, back to the atherosclerosis risk in communities study, which you could see on the left. On the y axis, we have survival for you from PAD hospitalization. On the x axis, we have follow up in years, 0 to 25. The groups are divided into those who have greater than a high school education, high school or equivalent, or less than high school. You can see that those that did not achieve a high school education are more likely to be hospitalized or PAD complication.

Health Literacy and PAD

This is a good time to segue into health literacy and PAD.

So what is health literacy? Health literacy is the degree to which individuals are able to access and process basic health information and services and thereby participate in health related decisions. So how is health literacy interacting with social determinants of health and outcomes? Well what you can see here in the figure to the left health literacy really interacts with all of the social determinants we've been talking about for the last few minutes. We have education, race, ethnicity, income, community, environment and English proficiency. So why is health literacy important when caring for patients with PAD? In general, patients are less familiar with PAD than heart disease or stroke.

Patients from different racial and ethnic backgrounds can be at higher risk of complications from PAD and are likely unaware of their increased risk. I know that many of my patients that I see in clinic who are African American or Hispanic have never even heard of PAD, much less the complications that are secondary to this disease. It's also important to know that low socio economic status impacts access to care and is also associated with a lower health literacy.

Strategies and Applications

So here are some practical steps to help with health literacy for our PAD patients. First you want to raise awareness to educate your staff about health literacy. You also want to communicate clearly. You want to use plain language, clogged blood vessels in addition to peripheral artery disease. This is important, especially if you're seeing multiple ethnic groups in which English is not their first or primary language. It's also very important to use pictures or diagrams because often this helps with the understanding and communication.

You also want to use the teach-back method. You want to ask patients to explain what their understanding is of their treatment plan and what to watch out for.

Assessing PAD

So now we're going to talk about assessing PAD. This all starts with the history and physical exam is important to note risk factors for assessing PAD are: age greater than or equal to 65, a history of diabetes, hyperlipidemia, or chronic kidney disease, atherosclerosis in another location, smoking and family history. So who's got risks? Well, those who are greater than or equal to 65 years. Those were 50 to 64 years plus risk factors for atherosclerosis or a family history of PAD, if you're less than 50 years with diabetes plus one additional risk factor for atherosclerosis in another location. Here, we talked about cerebral vascular disease, or carotid disease, or coronary artery disease. In regards to the physical exam, it's very important to make sure you assess all of the pulses of the patient in the lower extremities.

You want to take a good listen and feel for the femoral pulses and here for bruits, you want to go ahead and measure the popliteal pulses. These other pulses behind the pedal pulses, the posterior tibial pulses, Dorsalis Pedis, and you also always want to inspect the feet for wounds. So please take off your patients' socks. Now back to our case. If you recall, we have an elderly woman who has come in with symptoms of claudication and ischemic pain at rest. On physical exam findings, remember, we took off her socks. We can feel that they have abnormal pedal pulses if you recall the pedal pulses were zero on the right foot and one for the Dorsalis Pedis and posterior tibial on the left foot. Now the grading system for pulses zero is absent, one is diminished, two is normal and three is bounding. Now the ankle brachial index. In order to perform this measurement, you want to lay your patients flat for at least five minutes. The brachial ankle systolic pressures are taken with a doppler device. We will use the highest brachial pressure as a denominator for both legs. The ankle brachial pressure is used as the numerator for the corresponding leg. The ABI will be your ankle systolic pressure over your brachial systolic pressure. Now, back to our patient case. Now, if you look at the brachial pressures, the highest was in the right, so this is a number we'll use in the denominator. We will start off with the right since that is where the patient is symptomatic and the highest of the two ankle pressures is the Dorsalis Pedis at 77 giving us an ABI of .59 on the left. The highest pressure reading of the two ankle readings is 126 of the Dorsalis Pedis and again we'll divide that by the highest of the two upper arm pressures, which is the right on 30. Giving us an ABI of .97. Our doppler signals are consistent with our ABIs on the right monophasic where we had an ABI of .59 on the left we had bi-phasic in the PT and triphasic in the dorsalis pedis.

So based on our ABI, this patient has a diagnosis of peripheral artery disease. However, if you were keeping in mind all our social determinants of health throughout the history and exam and the patient's background, you can start to get a sense and your index of suspicion for PAD should have been very high even before we performed our ABI. As previously discussed, we have an ABI of less than .9, so this is abnormal and give us a diagnosis, a PAD borderline is anything, any reading between .91 and .99. Normal is 1.0 to 1.4. If you get a reading of 1.4, this is indeterminate and it's usually caused by non compressible vessels that are heavily calcified, so our take home points for our Webinar, recognizing social determinants of health for PAD. We highlighted a few: age ethnicity, economic status, education and health literacy.

Summary

Know that these are just key determinants, but there are many out there and you want to use these social determinants to assess for PAD. Please don't forget other key risk factors for PAD such as cigarette smoking, high blood pressure, high cholesterol, and hopefully you can always come back to our webinar and use our guidelines on how to do the ankle brachial index. It's a very simple procedure that you can do in clinic right there and it'll give you a diagnosis of PAD

readily. Thank you for joining us today for this Webinar. Again, I'm Antonio Gutierrez and I specialize in vascular medicine and interventional cardiology. Janssen pharmaceuticals is a proud sponsor of the American Heart Association's efforts to educate healthcare practitioners about peripheral artery disease. If you would like to watch this webinar again or show it to your colleagues, please visit [heart.org/managing PAD](http://heart.org/managingPAD). Thank you and have a great day.