Reducing the Burden of AMD: What Primary Care NPs Can Do

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Audrey Stevenson: So thank you for that introduction. My name is Dr. Audrey Stevenson. I'm going to be talking about reducing the burden of AMD, what the primary care nurse practitioner can do. I want to start by talking about a brief overview of AMD epidemiology and its burden. We know that there are 19.8 million individuals in the US that are living with AMD. And 1.5 million of those individuals are living with the life-threatening form of AMD. The proportion of those individuals at 40 years of age and older with AMD is 12.6%. We know that this is a disease that increases with age. Starting at the age of 40 years, we start to see an increase in AMD. The vision-impacting form of AMD starts to occur more after the age of 65. By the time an individual is 95 years of age, over 60% of individuals are going to be living with AMD.

In looking at the burden of AMD, we can see that there is a direct impact on vision. So some of the risk factors for developing AMD include both modifiable and non-modifiable risk factors. Some of the non-modifiable risk factors include being older age, having a genetic susceptibility or family history of AMD and being of the white or Caucasian race. Now, some of the modifiable risk factors that an individual can have, smoking. Smoking is one of the most highly correlated risk factors associated with the development of AMD. Diet also has an impact. So having a diet that is high in saturated fat and cholesterol or low intake of antioxidants, vitamins and minerals can also be associated with the development of AMD. Individuals who have high sunlight exposure greater than eight hours per day, so individuals working outside or not using eye protection, and then individuals that have low physical activity. Alcohol is also a risk factor for those individuals that are consuming more than 20 grams per day.

Some of the clinical factors that we find that are associated with AMD, having a BMI of 30 or greater, having a history of hypertension, dyslipidemia, or if the individual has AMD in the other eye.

In recognizing the burden of the disease, we can see that there are a number of different impacts that having low vision can have on an individual's life. So in my own clinical experience and personal experience, I've known nurses who can no longer do fine types of activities such as suturing. I also noted in some other patients that in trying to read they would turn their head slightly to the side so that they were using more of their peripheral vision rather than their central vision to be able to read. So sometimes, our patients will make accommodations without realizing that they're actually having some decreased visual acuity. Also we've had individuals that have been both in the workplace and as patients note that they are no longer able to read or to be able to engage in some of the activities that they were able to formally do. It's very important for early recognition.

There is a natural history of AMD progression. The stages are early, intermediate, and there are two forms of late AMD. One is the non-neovascular form, and the other is the neovascular form. In the early stages of AMD, we start to see age-related loss of choriocapillaris. We can see reduced blood supply to the retinal pigment epithelium. We can also see accumulation of drusen, which are the yellow deposits in the retina that consist of lipids, proteins, and cellular debris. And we can see signs of oxidative stress and inflammation. As the disease progresses, we see increases in the deposits of the Drusen. And in the late non-neovascular form of AMD, we see the death of the photoreceptors and the RPE cells. And in the late neovascular, we see the growth of new blood vessels that form into the choroid and outer retina

As this progresses, we can see in the late stages, the development of geographic atrophy or the wet forms of AMD.

Now, in the early stages of AMD, the patient often is asymptomatic. This is why it's really important for us to have early recognition of AMD. Some of the patients will present with no changes in visual acuity. So the visual acuity may be normal on the physical examination. Some of the early patient reported symptoms, things such as changes in the ability to drive at night, having difficulty with dim adjustment, being able to read where there's low light, and then also starting to note that straight lines can appear wavy.

Tulay, why don't you tell us some of the distinguishing early AMD and other ophthalmologic disorders associated with AMD?

Tulay Cakiner-Eglimez: Thank you, Audrey. Some of the cataract and AMD symptoms may overlap. Both conditions share symptoms such as blurry vision, difficulty seeing at night, and loss of clear color vision. However, the most significant difference compared to cataract symptoms are the blurry or dark areas in the center of the vision. I usually tell my patients that removing the cataract will not improve the center of their vision because usually they think that having cataract surgery will resolve all their problems. So they have to understand that having cataract surgery will allow more light entered to the eye, but will not improve the central vision.

So symptoms that may not represent macular degeneration are usually halos, floaters, peripheral vision loss, eye pain, and increased eye pressure. We must remember that macular degeneration patients may also have other conditions such as cataracts and glaucoma, and those things may happen and occur in patients if they have any retinal detachment or if they have glaucoma along with their AMDs.

So the considerations for differential diagnosis. The differential diagnosis of dry AMD includes retinal pigment epithelial changes secondary to central serocorioretinopathy, myopic degeneration, light or laser damage, and drug toxicity such as hydroxychloroquine toxicity. However, these conditions affect younger people and usually missing the key AMD features like drusen.

I would like to talk a little bit about geographic atrophy. The annual incidence of GA 1.9 per 1000 Caucasians age older than 50 years. The rate of progression is highly variable. The range may be less than 0.8 millimeters squared to 10.2 millimeters squared a year, mean 2.5 millimeters squared per year. GA grows faster towards the periphery, and median time to bilateral GA is about seven years. The median time for central involvement is usually 2.5 years. Geographic entropy growing rate may be different in each eye.

What about wet AMD? Up to 29% of patients with GA develop wet AMD in about two years with thinning photoreceptors, retinal epithelium and choriocapillaris. Up to 37% of patients with wet AMD develop GA in about two years.

Audrey, we know that AMD is progressive disease causing blindness. Can you talk about the role of primary care NPs to slow disease progression?

Audrey Stevenson: Yes, thank you for that. So one of the first things that we're going to be doing is performing a comprehensive medical history on our patients, asking about some of the risk factors that I previously mentioned, but also some specific questions with regard to their vision and to evaluate their vision function. So some of the examples of questions that I'm going to ask the patient are, how was your vision 10 years ago and how does that compare with your vision now? Have you had any vision changes? So how has your vision changed? Have you noticed any dark, blurry, or white areas in the center area of your vision? How about reading? Have you noticed any changes in your ability to read with or without reading glasses? What about driving? And what about driving at night? Any changes with your ability to do that? And are there things that you used to be able to do that you can't do now?

Also, looking at the timing of vision changes. So when did you first begin to notice the vision changes? And how has your vision changed over the last few months?

So in addition to asking patients about their vision and the key questions that we've just covered, let's talk about screening with comprehensive eye evaluations. The comprehensive medical eye evaluation includes the examination of the eye structures using different imaging modalities and tests. Now remember, routine vision examinations for refractive correction are not equivalent to comprehensive medical eye evaluations. The American Academy of Ophthalmology recommends periodic comprehensive medical eye evaluations with increasing frequency with age. So in terms of the recommendation, individuals under the age of 40 years, you're going to recommend one of these comprehensive evaluations every 5 to 10 years. For the individual between the ages of 40 and 54, every 2 to 4 years starting at the age of 40 particularly if no prior history of a comprehensive eye evaluation is present. For the individual between the ages of 55 and 64, you're going to recommend one every one to three years. And for the person that is 65 years of age and older, we're going to recommend a comprehensive eye evaluation every one to two years.

We're also going to want to recommend the use of the Amsler grid testing. So this is something that we can perform initially in the office, and we can encourage our patients to continue to self-monitor with this. Now, in using the Amsler grid testing, remember, we're going to have the individual cover or close one eye. We're going to hold the chart at a comfortable reading distance from the other eye and we're going to have the patient focus on the center dot in the grid. We're going to have them outline with their fingertip or with a pen to mark the areas of the chart where the grid is distorted, which may be suggestive of AMD. Now, as Tulay mentioned, if it's missing or absent from that grid, it may be more suggestive of glaucoma. And then we're going to repeat with the other eye. Now, one thing to do is to make sure that we're having the patient use any reading glasses that they normally use for reading.

We also want to consider using referral. So our care team and our referral partners for AMD, we're in primary care and we're going to be the ones often identifying the early AMD and recommending screening. So we're going to want to do a referral for that. Now, in situations where we think that there's an urgent referral, we're going to want to make sure that we counsel the patient regarding the level of urgency at the referral and including any potential effects on their vision. We're going to document all outcomes of the clinical eye evaluation, including the vision history and changes that we've noted, the visual acuity and any fundoscopic findings that we found.

We're going to assist our patients in identifying in-network providers, and then be able to foster those relationships and keep the communication with those eye care specialists that we're working with. And if we have a situation where we see the need for an urgent referral, we're going to consider contacting the ophthalmology clinic directly. We also want to make sure that our patients are aware of the need for getting into these referral networks very, very quickly. Tulay, what are some other screening tools that our clinicians might consider using?

Tulay Cakiner-Eglimez: Audrey we have excellent screening tools in ophthalmology, such as optical coherence tomography, optical coherence tomography angiography, fluorescein angiography, autofluorescence. The implication of OCT in ophthalmology practice allows ophthalmologists to detect retinal pathologies very early and treat patients more efficiently. Today, OCT is an indispensable image modality in every retina practice.

I have a long ophthalmology career. I've seen many devices and I'm very happy to see those devices are just getting better and better and very easy to use. In our practice, we perform OCTs for every retina patients. They see their images. I like to show their images to the patients and I can show them the difference between the prior visit and the current visit. So it is very efficient for them to see the difference prior to intravitreal injections and after the intravitreal injections. So some of our patients are expert looking at their images and say that, oh, I think I need injection this time. So they can see the retinal structures

swollen and they know that this requires intravitreal injection. So it's very useful for them to show our patients how was their retina before and after the injections.

Audrey, can you please talk about non-pharmacologic management of AMD?

Audrey Stevenson: I would be happy to. There's a number of non-pharmacologic measures that we can encourage patients to use. One is smoking cessation. So helping our patients to be able to quit smoking by using a variety of patches or other medications, counseling, and other strategies to help them with this. As I mentioned earlier, smoking is one of the greatest risks for the development of AMD. Also, diet is very important. So just as we're making recommendations for healthy lifestyles for patients in terms of cardiovascular health, we want to make the same recommendations to our patients that would help to reduce the risk of AMD.

So diet and alcohol. So the Mediterranean diet is one that we often recommend for other wellness. We also want to make sure that patients are consuming moderate amounts of alcohol, as I mentioned earlier, less than 20 grams per day. Also noting that they should be using eye protection if they're outside or if they're in large areas where there's a large amount of sunlight.

So Tulay, what are some of the other strategies that we can use to help prevent AMD in our patients?

Tulay Cakiner-Eglimez: Audrey, one of them is low vision rehabilitation and services. So, these are very effective options for coping with AMD-related vision loss. It improves the patient's quality of life and psychologic well-being. Typical rehabilitative interventions include assessment of remaining physical functions. Low-vision specialists prescribe the devices and train patients to use the low-vision aids. They provide training and educational programs, orientation and mobility training, assistance with daily living activities, driving and lighting adjustments. We routinely refer our low-vision patients with AMD to low vision departments and sometimes blind vision rehabilitation specialists go to their houses and just evaluate the patients in their home environment.

I would like to talk about AREDS supplements briefly. The results from AREDS1 and AREDS2 show that formulations can decrease the risk of developing advanced AMD in patients with intermediate dry AMD. However, AREDS 2 formulas have no protective effect on early AMD and do not prevent the onset of AMD. Until recently, no treatments were available for geographic atrophy.

In 2023, two intravitreal complement inhibitors were approved for a geographic atrophy secondary to AMD, which is a great hope for patients with GA. I'm going to talk right now about anti-vitreal VGF therapy for wet AMD.

Anti-VEGF therapy is the first-line treatment for wet AMD and one of the most important therapeutic advances in ophthalmology. There are very effective anti-VEGFs available to manage wet AMD to maintain visual acuity.

Let's talk about the patient preparation. The concept of having a drug injected into the eye sounds horrible, but most people find the experience tolerable. Patients should be given detailed explanations on why the eye provider performs injections and how this will save visual acuity. All questions should be answered before the procedure and informed consent should be signed. I usually explain the entire process again before preparing patients, especially if they are going to have their first intravitreal injection. Like mark the eyesight, place the bracelets on the wrist, place the numbing drop first, placing betadine, and anesthetic ointment application. Then what will happen when the retina specialist comes to the room.

When the eye provider arrives, timeout will be performed, and the speculum will be placed. The eye provider will measure the distance from the limbus to decide the exact injection site and administer the drug. The speculum will be removed. The eye will be washed with saline to remove betadine to prevent corneal toxicity. Post-injection instructions will be given to the patient, and the next visit will be scheduled.

Role of NPs in ophthalmology practices. Ophthalmology is probably the most impactful specialty of all the medical specialties due to age-related eye conditions. Since the aging population will be tripled by 2050 and the number of ophthalmologists has been stable for decades, patients with aging eye problems will have difficulty accessing their eye providers to be seen promptly and have treatments such as intravitreal injections. In my opinion, intravitreal injections are straightforward procedures, and nurse practitioners can perform these procedures very efficiently and safely after proper education, observation, and guidance by an ophthalmologist.

When specific numbers are met safely, nurse practitioners can perform intravitreal injections without the presence of an ophthalmologist, allowing eye providers to see more patients and reducing the waiting time for patients.

What are the barriers for intravitreal injections? Patients' health status should be evaluated before the injection. Patients with systemic or eye infections should not receive intravitreal injections.

Intraocular pressures of glaucoma patients may require closer follow-up after the injections due to possible risk of elevated eye pressure. A cardiology consult may be necessary for the patients with recent cardiac events. Intravitreal injections currently performed by ophthalmologists and retinal specialists. NP colleagues in England have performed intravitreal injections efficiently and safely for over a decade.

In the US, ortho nurse practitioners perform joint injections, certified nurse anesthetists perform peribulbar and retrobulbar injections before eye surgeries, and dermatology NPs perform fillers around the eye area safely. Again, in my opinion, after proper education,

training, and documentation, advanced practice providers can efficiently perform these injections.

What are the time commitment frequency of these injections? The frequency of injections depend on the anti-VEGF agent and their patient's condition. We have very efficient agents requiring less frequent follow-ups to maintain the vision for extended period. What about fear? Fear of needle is common and may reduce over time. Some patients may require calming medications before intravitreal injections and emotional support is critical. However, as we discussed before, procedures are very safe after a couple of injections, patients feel comfortable and do not feel fear about the procedures.

Anti-VEGF therapy, non-adherence, and loss of follow-up. Loss of follow-up may happen. Patients may not remember eye appointments or have health issues preventing them to follow-up. Our ophthalmology department constantly receives consults from primary care NPs, physician assistants, and physicians regarding patients who lost follow-up. And we see them as soon as possible. Patients should understand intravitreal injections protect their vision. They should reschedule in a few weeks if unable to keep their appointment. Patients may be treated with treat and extend or PRN dosing regimen.

Audrey, would you like to talk about shared decision-making process in primary care?

Audrey Stevenson: So thank you, Tulay. We want to make sure that we are continuing to use that shared decision making in caring for our patients with AMD. We want to be able to take the time to do an adequate history and physical on these patients to be able to identify those at the earliest risk of AMD and to make sure that if we're finding worrisome findings on the physical or on the history that we're getting them into the specialty clinics as early as possible. We may also on occasion receive patients that come to us reporting a history of AMD, but have not been started on the AREDS2 or have not had any type of intervention. So making sure that we're communicating with our specialty clinics and making sure that the patient is aware of the importance of keeping their scheduled appointments and being able to identify any needs that the patient has to reduce barriers to getting to those appointments. In some cases, we have patients who may have transportation problems, they may have the inability to get away from work for these appointments, and they may eventually stop going to these appointments for whatever reason. It's important for us to identify those patients that maybe are lagging or are missing appointments and encourage them to continue to keep these appointments. It may be helpful to remind them to set their next appointment at the time that they're in the specialty clinic so that they can be able to meet those appointments.

Our communication and collaboration with these specialty providers is going to be key in providing this patient-centered care, making sure that we're aware of what the treatment plan is and how we can support the patient in being able to adhere to that plan.

Tulay, why don't you give us any takeaway points that we want our audience to remember today?

Tulay Cakiner-Eglimez: Thank you, Audrey

I think we will see more nurse practitioners specialize in ophthalmology. I hope nurse practitioner programs will consider providing more ophthalmology training programs, focusing on age-related eye conditions, such as cataracts, glaucoma, diabetic retinopathy, and macular degeneration. Providing skills for dilated exams and focusing on eye disease management should be essential to detect early signs of these blinding conditions in routine annual exams or in-home visits.

We know that the aging population will significantly increase next few decades and nurse practitioners will be an excellent resource to prevent vision loss from aging diseases. And I would like to thank AANP for allowing us to talk about this very important disease and the prevention of disease and the role of nurse practitioners. Thank you.