



Environmental toxins and Gulf War syndrome

Guest: Dr. Omowunmi Osinubi

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Kirsty Cullen - [00:00:16]

Welcome to the Fatigue Super Conference, I'm Kirsty Cullen, CEO at the Optimum Health Clinic, and I'm joined today by Dr. Omowunmi Osinubi. She is a board certified occupational and environmental medicine physician and a certified functional medicine practitioner. She provides consultations to veterans and their health care providers on matters relating to complex medical health conditions and exposures of concern during military service. She also trains clinicians on military related exposures at conferences across the United States and now internationally as part of our own Fatigue Super Conference

Dr. Osinubi is an adjunct clinical professor of environmental and occupational health, and she is a subject matter expert in military, occupational and environmental exposures and related health effects. So it's my absolute pleasure and delight to welcome you today, Dr. Osinubi.

Dr. Omowunmi Osinubi

Thank you, Kirsty, for your kind introduction. I'm very much honored to be here today.

Kirsty Cullen

So, for our interview today, you are speaking to us in your capacity as a private practice practitioner, and you are going to share with us your clinical experience about occupational and environmental exposures and how they might impact on veterans health, in particular, symptoms such as fatigue.

Dr. Omowunmi Osinubi

Yes, the views that I express at this presentation represent only my views and does not represent that of any agency organization that I'm may be affiliated with.

Kirsty Cullen

OK, so to get us started, please, could you share with our audience what got you interested in working in occupational and environmental medicine? And how did that lead to the work that you do with veterans?

Dr. Omowunmi Osinubi

You know, my first interest in workers' health was when I was actually in medical school, I trained in Nigeria, so that was sometime in the mid 1980s. I had a patient who had inhaled a lot of dust from breaking down cement bricks with a sledge hammer. You see, someone had built an illegal structure on his plot of land. And so he took the law into his hands and literally, single handedly knocked down the building over several weeks.

Well, many decades later, he developed a severe fibrotic lung condition and died of respiratory failure. My training in medical school did not recognize that breathing in construction dust, such as cement or silica, could cause lung disease. But I always remember that patient as we had no explanation for his lung disease at the time.

So I completed my residency in anesthesiology in the United Kingdom and then developed an interest in occupational medicine. When I was doing my pain management fellowship at the Yale School of Medicine in the U.S., you see a large proportion of my chronic pain patients had developed their chronic pain from workplace injuries. And I remember this particular veteran. He had served in Vietnam and had been exposed to Agent Orange, a type of herbicide that was sprayed during the war. So he developed nerve pains. His regular doctors couldn't figure it out. And then he told me about his exposures to Agent Orange. And then I started to do some research. Then I realized that toxic exposures can actually cause disease, such as intractable neuropathy that this patient had, was experiencing.

So those were two patients that had workplace exposures that led to chronic illness. That led me to become interested in the field. And I decided to undergo training in occupational and environmental medicine. So I did my residency at the occupational medicine program at the Mount Sinai School of Medicine in New York, there I worked with a lot of workers who were bridge workers. They had high exposures to lead dust and petrochemical solvents, paint and paint thinners. And I saw firsthand the impact of these toxic exposures on workers' health, in particular the impact that it had on their brain.

Some of them had chronic solvent encephalopathy, also known as chronic painter syndrome. And that can affect the brain in ways that, we now understand, can predispose people to having symptoms such as fatigue. I also worked with people who applied pesticides, like the pesticide applicators, who were spraying pesticides in high rises in New York City. They presented with symptoms of neurasthenia due to the impacts of the chemicals on their nervous system.

Kirsty Cullen - [00:05:00]

So, Dr. Osinubi, can I just interject there for a moment, as some of our audience may not be familiar with the term neurasthenia, what exactly is that?

Dr. Omowunmi Osinubi

Well, neurasthenia is a condition that's characterized by physical and mental exhaustion. It's usually accompanied by symptoms such as headaches and irritability, although we don't know the exact cause. We know that it can be associated with much issues like depression and emotional stress. And sometimes it might actually look like a chronic fatigue syndrome.

Kirsty Cullen

And it's interesting to hear that some types of chemical exposures in workers may contribute to chronic fatigue. So from there, how did you end up working with veterans?

Dr. Omowunmi Osinubi

You know, after my residency training in New York, I worked in academia doing clinical work, teaching and researching and occupational and environmental medicine for about 10 years, and then I transitioned with working with veterans, which I've done for the past 12 years. You see, veterans are a very unique population to work with. Many of them have had extensive exposures during their military service, especially when they've deployed to combat operations, such as, Vietnam, the Gulf War and the more recent wars in Iraq and Afghanistan.

Kirsty Cullen

And so, when we're talking about hazardous exposures in your field of work, what exactly does that mean?

Dr. Omowunmi Osinubi - [00:06:27]

You know, in our field of occupational and environmental medicine, first of all, we look at prevention, we look at recognition and evaluation of the effects of these exposures or hazards on human health and illness. And this has, that's classified into broad categories. We talk about physical hazards. We talk about chemical hazards. We talk about biological hazards. And then we'll talk about psychological hazards. All of those are hazards that are relevant to our work in occupational and environmental medicine.

Kirsty Cullen

And what are some of the things that veterans are exposed to and how does that impact and affect them?

Dr. Omowunmi Osinubi

So, you know, many veterans have concerns about, you know, the impact of the military exposures on their health, and these exposures do vary widely, actually. They kind of occur during their regular duties whilst they're stateside, you know, for example, an aircraft mechanic may work with petrochemical solvents or paints during their stateside duties.

They can also be exposed when they're deployed overseas for combat operations. So in the course of my work, the veterans that I see have been exposed to multiple hazards during their military career. And they may have physical trauma, obviously, from breaching activities or blast exposures or just being injured in war. Those are physical exposures.

Then there's psychological trauma. Trauma from witnessing the carnage of war, you know, handling human remains. Many of our veterans have had to endure that. Some have even experienced, unfortunately, sexual trauma during their military service. All of those impact the physiology of the body and it can manifest in different ways. There's also the stress of moral injury associated with combat experience, because sometimes a person's personal and spiritual beliefs may be different from what they're asked to do, as part of their military duties. That has an impact.

Then get exposures to chemical hazards, we have a better understanding about now, for example, smoke from burning oil wells at the open burn pits that were pervasive during the Gulf War and the more recent combat in Iraq and Afghanistan. There's the exhaust fumes from vehicles, aircrafts and generally the fumes, the petrochemical solvents and fuels, herbicides and pesticides that were spread around the base. And also the personal pesticides that were applied on the skin and the uniform. All of those can be absorbed in the body and cause health problems. There are heavy metals that are from weapon systems, like lead, that soldiers are exposed to because of their military service. You know, so those are a lot of exposures that they encounter.

And then we must not lose sight of the biological exposure. They are in different part of the country they've never been to before, gastrointestinal infections like dysentery that impact their intestines and also can affect them for a long time to come. So all of these exposures can affect the functioning of the body. And many veterans experience long-term health consequences as a result of one or more of these exposures.

Kirsty Cullen

It's a huge collective burden, isn't it? And how about civilians, can they also experience toxic exposures in the same way such as these?

Dr. Omowunmi Osinubi

Toxicant occupational exposures are not unique to military personnel or those who deploy overseas for combat, they are seen in civilian populations. So let's take for example, at least I'll speak about my experience in the United States, millions of U.S. workers are exposed to organic solvents used in many, many industries. And that level of exposure is going to depend on the amount of solvents that

they used, how long they use it for, and the type of environment in which the work is being done, whether they have the appropriate personal protective equipment or they have the appropriate ventilation system in place.

So people who sustain years of daily exposures to organic solvents, like painters, can develop a condition called chronic solvent encephalopathy. When that condition manifests it can show up as forgetfulness, concentration problems, fatigue, irritability, mood problems, psychological impairment that is actually evident on psychological testing and even dementia.

They're abnormal findings on advanced neuro diagnostic studies, like if you do functional MRI on these patients or brain SPECT scans or electroencephalography, you will find abnormalities in their brain.

As I mentioned earlier, those people who are exposed to organophosphate pesticides like the pesticide applicators, they present with neurasthenia and chronic fatigue is a presenting symptom. So when somebody like that walks into your office and they say, I'm chronically fatigued, you want to find out from them, what job did they do? Or what job do they do? Are they potentially exposed to toxins that could be presenting with as chronic fatigue? And if you don't ask about those exposures, you may not get to the root cause of their problem.

Kirsty Cullen - [00:11:48]

And moving forwards, to kind of the current picture, is there a link, do you think at all, in terms of toxic burden and inflammation and what we're seeing in terms of post acute chronic COVID syndrome?

Dr. Omowunmi Osinubi

You know, you brought up a really, really good point. And this is something that's really good that we're taking more cognizant of right now, that even exposures such as viral infections can cause chronic fatigue. We've kind of known that about the Epstein-Barr virus in the past. But now that we're seeing our frontliners, medical doctors and nurses and even folks who work in the service industry that have been exposed to the COVID virus, about 40 percent of them are presenting with what we call the long-haul COVID or the post acute COVID viral syndrome, and many of them present with chronic fatigue. Research is beginning to show that, we don't have all the data, is that this is likely a post-viral chronic inflammation syndrome.

Kirsty Cullen

Such a fascinating link, isn't it? Let's talk more about military exposures then. So, I know that many Gulf War veterans came back not just with the effect of war related trauma, such as PTSD, but also with chronic medical symptoms and of course, now commonly termed as Gulf War illness. What is that and how does it affect people?

Dr. Omowunmi Osinubi

You know, Kirsty, about a third of the U.S. soldiers that deployed to the Gulf war now experience a constellation of chronic symptoms and illnesses that are not explained by established medical or psychiatric diagnosis, or even standard laboratory tests. And this is not actually unique only to the U.S. soldiers, we know that those British soldiers and Australian soldiers who are part of the coalition also experience the symptoms.

What are the symptoms they experience? Chronic fatigue, widespread muscle aches and joint pain, including fibromyalgia, headaches, breathing problems, memory and thinking problems, functional gastrointestinal disorders such as irritable bowel syndrome and skin abnormalities.

So the term Gulf War illness that you mentioned earlier on is used to describe this condition. And that's the term that's recommended by the National Academy of Medicine, formerly known as the Institute of Medicine. And it's also the term that's commonly used by scientists and clinicians and the veteran organizations, as well as the U.S. Department of Defense.

Kirsty Cullen - [00:14:21]

So, let's talk more about chronic fatigue within Gulf War veterans. What would you classify as the key causal factors?

Dr. Omowunmi Osinubi

You know, we still don't know the specific cause of Gulf War illness or the chronic fatigue that associated with that condition. What we do know that, you know based on research is that, this is a real physical medical condition and it's been associated with the constellation of the exposures that they've experienced during their deployment. This condition cannot be passed on to psychological stress or attributed to a psychiatric problem.

Kirsty Cullen

And is there a diagnostic test for Gulf War illness as it stands?

Dr. Omowunmi Osinubi

You know, unfortunately, to date, there is no diagnosis, there's no diagnostic test for Gulf War illness. What we do know, though, is that there's a lot research that's active, that's going on, trying to figure out what are the biomarkers or more objective findings that we can have to have a better clinical case definition for Gulf War illness? So that's a very important area of interest for the Department of Defense and the Department of Veterans' Affairs, as they're very much interested in that topic, as they're important stakeholders for obvious reasons.

Kirsty Cullen

And can you share with our audience today some of the research findings with respect to Gulf War illness and chronic fatigue?

Dr. Omowunmi Osinubi

You know, that's quite an extensive topic, I'm happy to touch on some of the emerging areas of research of what those studies show. To give you some context, right, while I was doing my residency training, the prevailing clinical perspective was that when a patient complained of chronic fatigue or fibromyalgia, they were deemed to have a psychosomatic illness. In layman's terms, it's all in your head. Right? And they were labeled as such, which is quite unfortunate.

Fast forward a couple of decades later, research has shown us that the actual anatomical correlates of functional changes in the brain, in patients that have chronic fatigue and fibromyalgia, and this makes them more sensitive to sensory inputs that exacerbates or accentuates their perception of pain and fatigue.

The same holds true for other related conditions, such as irritable bowel syndrome. And the scientific name for this is called central sensitization syndrome. So one of the researchers that has done a lot of work in this area is Dr. Georgopoulos and his colleagues. And they demonstrate that the brain patterns of synchronous neural interactions in patients with Gulf War illness is very different from non Gulf War ill persons. There's further evidence that the abnormal patterns that are seen in Gulf War ill patient brains' are related to altered immune function. So the research evidence is really pointing towards Gulf War illness being a new immune disease.

Research has also shown us that when Gulf War ill veterans exercise, the pattern of brain activity is very different compared to persons without Gulf War illness, when those people exercise. For example, researchers at Georgetown University demonstrate that Gulf War ill persons with chronic fatigue, when they engage in physical exercise, there's increase in activity in areas of the brain. For example, the dorsal midbrain, the left insula cortex and the right middle insula. Those areas in the brain are the areas that called for threat assessment, like your vigilant looking for threat, right? Pain, abnormal enhanced body sensations such as growling of the stomach, dry mouth, tense muscles, racing heart, negative emotions, vigilant attention, there's increased activity in those areas of the brain when Gulf War ill patients exercise.

That is not saying when non Gulf War, when healthy people exercise, you don't get that kind of increased activity in those areas of the brain. So the objective finding of this abnormal neural activation provides a plausible neuroanatomical and physiological explanation for the post-exertional fatigue and other unpleasant physical symptoms experienced by Gulf War ill veterans.

I know that's a lot of information to take in, but the bottom line is that the brain's of Gulf War ill veterans function very differently with exercise versus those that do not have that condition.

Kirsty Cullen - [00:19:15]

It's such fascinating research isn't it, for conditions that have been, for a long time, thought of as psychological, to be able to really elucidate these mechanisms through research is fascinating and really necessary, I think.

Dr. Osinubi, we know that many people suffer from CFS and obviously many of those did not serve in the military, nor were they deployed. So, is the fatigue in Gulf War illness similar to or different from the type of fatigue we might see in civilians with chronic fatigue syndrome?

Dr. Omowunmi Osinubi

You know, Kirsty, that's a great question. OK, so for starters, let's say with regards to Gulf War illness, about a third of them, those who served have that condition. That's a substantial fraction of those who served in the Gulf War. Now, compare that to the civilian population, where only 2 percent of the general population suffer from chronic fatigue syndrome, also known as myalgic encephalomyelitis. So in both populations, chronic fatigue sufferers tend to have cognitive difficulties, often described as brain fog.

So, is this the same condition or is it different? So, let's look at the data a little bit. We know that the clinical presentation of fatigue may be similar in Gulf War ill and in civilian CFS. What neuroimaging studies, advanced studies such as functional MRI has shown us is that when the brain of Gulf War ill and civilian CFS patients are challenged with cognitive exercises, their brains actually respond differently to such stressors. So it's possible that they're actually different.

So let me give you some specific examples. When they are presented with mental exercise challenge, the functional MRI of Gulf War ill persons will show a decrease in brain activity in the periaqueductal gray. This is an area where pain is processed in the brain, it will also cause a decrease in brain activity in the brainstem and the cerebellum. These are the parts of the brain that are responsible for fine motor control, cognition, pain and emotion. Whereas in civilian CFS patients there was an increase in activities in those regions of the brain. In healthy patients, there were no changes in the same areas of interest in the brain.

So this was the research that was conducted by Dr. Washington's group in Georgetown University. And these same researchers also looked at post-exertion, cerebrospinal fluid in Gulf War ill patients and in civilian CFS patients. And what they found was that the CFS fluid in those populations had different molecular makeup post exercise. So the researchers concluded that Gulf War illness is a distinct entity from civilian CFS, even though clinically they may appear the same based on their symptoms alone.

Kirsty Cullen - [00:22:28]

You've shared a lot of information with us about Gulf War illness and other occupational exposures and how those can impact on chronic fatigue. I'm interested to ask, what steps can people take towards improving their health and where can people start?

Dr. Omowunmi Osinubi

You know, this is good to discuss, because we know that the key to improving any symptom really, is not to put a band-aid on it, which is the typical approach in allopathic medicine, but to address the root cause of the causes of that symptom. We know that fatigue is a multifactorial condition. Therefore, we have to really understand the underlying cause or the causes of the fatigue and then target the interventions to address those areas that would be most important.

So with respect to occupational neurotoxic exposures, the first thing, of course, is you want to remove the exposures where you can, you want to avoid further exposures, or you see, there is nothing you can do about past exposures, you can only do something about the current and the future. So what we do then is that we focus on optimizing brain health and there are many integrative health approaches that could be helpful in improving fatigue and its accompanying cognitive symptoms and obviously the overall brain health of persons who suffered from those exposures, including traumatic brain injury, which we have already talked about a lot. But we have to recognize that that's a co-occurring condition in combat veterans.

So we start with personalized, modifiable life factors. For example, adequate sleep, sleep is huge. You need 7 to 8 hours of good sleep, refreshing sleep for your brain to function well and to reduce your symptoms of fatigue. Nutrition is vitally important as well as hydration, right? You have to make sure that you have your phytonutrients on board. Appropriate levels of physical activity, I know that is a challenge for people with chronic fatigue. It has to be graded. It has to be paced. And you may need a health coach to help you with that. But that's really important because if you don't use it, you're going to lose it. So physical activity is very important.

Obviously, reduction in stress. The body doesn't know the difference between a physical stressor, like a lion chasing you down the street, or emotional cognitive stress. And engaging in meditation, in yoga, all of those stress reduction activities can help to dampen down the stress response. Positive relationships and social connections are very important, especially in this day of the pandemic. You know, with the lockdown, we are finding that people are really stressed out, they fear of the virus and the social distancing and lost jobs, all of those impact people. And so, when we're able to manage that, we're able to improve mental health, cognitive functioning and the overall sense of not feeling fatigued.

So I'm going to talk a little bit more about nutrition, because that is key. It is indeed. So from the American perspective, and I'm sure this is not unique to America, but most Western countries, the standard American diet, the short form of that is SAD, comprises of calorie dense, nutrient deficient, highly processed foods that are proinflammatory to the brain and the neural immune pathways.

So, my goal, as I work with patients, is to help them transition from that SAD diet, that makes them sad, to an anti-inflammatory food plan. The mitochondria is the powerhouse of this cell and nourishing the mitochondria is going to help to optimize the mitochondrial function and the overall wellness and functioning of this cell and overall feeling of well-being. So the Institute of Functional Medicine has a mitochondrial food plan that has helped many people with improving their chronic fatigue and their related symptoms.

So, people ask, OK, yeah, I eat healthy. So do I still need to supplement? Absolutely. Why is that? Well, many of us try to eat healthy. We try to eat organic. But we do know that our food sources are depleted of nutritional supplements. The soil in which the food is grown has been depleted. You need to eat about 80 cups of spinach to get the same nourishment that your grandparents got from 1 cup of spinach many decades ago. So it's important to supplement.

So these nutritional supplements, vital nutrients, can help support healthy brain function, especially when you're using antioxidant phytonutrients that have anti-inflammatory properties. And we know it's also very helpful, with the current COVID pandemic as well, so let me just put a plug in for that. So our goal really is to optimize detoxification and improve mitochondrial function. So time will not permit me to cover that in more detail. But we do know that omega 3 fatty acids found in fish oil have beneficial effects on neurocognitive health and overall feeling of wellbeing.

So one other thing before I stop talking about that. So there are technologies that can help us, that show promise. So, for example, neurofeedback using quantitative electroencephalography, magnetoencephalography like therapy, hyperbaric oxygen therapy, all of those to help to improve a feeling of health and wholeness. And, there is a cumulative scientific data about the efficacy of these modalities. And in many published articles for fatigue, mood and cognitive difficulties. So one or more of those modalities may be considered as just the traditional allopathic approach in treating these conditions.

Kirsty Cullen - [00:28:22]

Superb. That was a wealth of information, thank you very much for that. And we could talk for hours on nutrition alone I'm absolutely confident of. Bringing it back to Gulf War veterans. Many of them have chronic symptoms, including fatigue, as we've discussed, that seriously impact on functioning. And so far, obviously, there isn't a cure for Gulf War illness. Is there an openness, I'm interested to know, to using non-traditional and sort of more complementary health approaches for supporting the health of servicemen and women?

Dr. Omowunmi Osinubi

Yes, I know that I mentioned the Department of Defense and the year earlier on and before I elaborate on this, please let me clarify that I'm speaking as a private citizen in private medical practice, not in capacity of an employee of any government agency, a federal institution, and the information I'm about share is in the public domain and is readily accessible via the Internet to anyone who is interested.

What we do know is that the Department of Veterans' Affairs, also known as the VA, has embraced the concept of whole health and it's incorporating multiple integrative modalities, including but not limited to chiropractic and nutritional education, cooking clinics, biofeedback, yoga, Qi gong, Reiki, therapeutic touch into the clinical care of veterans in many, many of these centers. And in fact, they're making them available to their staff for their own health and well-being as well.

So some VA centers have actually adapted the concept of functional medicine approach to veterans' health care, even though it's still early days yet. So on the whole, this is really good news for veterans and it's really encouraging for the preventive medicine community to see that these are coming online and onboard.

I'm also aware that the U.S. Department of Defense now has a program that treats their medical staff in functional medicine and that has been incorporated into total fitness initiatives in the context of overall readiness of the military's fighting force. For example, in response to the COVID-19 pandemic, a functional medicine model was adapted to develop the personal protective lifestyle and the personal protective nutrition initiative to help service members and their families put in place positive health behavioral approaches that's for immune function and build health resiliency in the current coronavirus pandemic climate. So all in all, this is all good news and I'm looking forward to all of that moving forward in the future.

Kirsty Cullen

Yes, absolute music to my ears, most certainly. And it's just so great to hear that progress is being made in those areas and things are moving in that kind of collective health paradigm. It's fantastic.

Dr. Osinubi, you shared a wealth of information with us. Thank you so much for bringing more attention to this topic for us today. Where can our listeners learn more about you?

Dr. Omowunmi Osinubi - [00:31:22]

Oh, thank you Kirsty. It's been an absolute delight working with you on this. And I very much appreciate the opportunity to share my experience with your viewers. I do have an interest in helping individuals understand how their unique and genetic susceptibilities and vulnerabilities and lifestyle factors interact with the occupational and environmental exposures to increase the risk of unfavorable health outcomes. I work with such individuals about how they might mitigate their negative health outcomes using a functional medicine and integrative medicine approach.

Viewers can learn more about me via my website. If you go to oehassociates.com, you would find information there, oehassociates.com.

Thank you, Kirsty.

Kirsty Cullen

Dr. Osinubi, many thanks again.