Rhabdomyolysis

Voiceover

00:00

Welcome to *The Beat*—a podcast series from the COPS Office at the Department of Justice. Featuring interviews with experts from a varied field of disciplines, *The Beat* provides law enforcement with the latest developments and trending topics in community policing.

Jennifer Donelan

00:16

Hello. I'm your host, Jennifer Donelan, and today we will hear from Kelly Kennedy, Ph.D. She's the owner of an organization called Fit-to-Enforce. They teach law enforcement physical fitness trainers how to instruct exercise sessions for their departments and/or academies. And today we're going to be discussing rhabdomyolysis, which is when I first read the word I had never heard of it. So, Dr. Kennedy, please tell me: What is rhabdomyolysis.

Dr. Kelly Kennedy

00:44

Rhabdomyolysis is the rapid breakdown of skeletal muscle from extreme physical exertion. My background is in exercise science and my Ph.D. is in research. So, I had never heard of rhabdomyolysis. I have a master's degree and several certifications in physical fitness and it was brought to my attention in 2002 from a defensive tactics sergeant who saw it in an article published. And it wasn't something that was on the forefront of any curriculum that I had ever listened to in my formal education, but when I read about it I knew that it was something that was very rare and something that happened typically in military settings or in paramilitary settings and traditionally wasn't seen very often. In fact, if you do see it very often, then there's a huge problem.

Donelan

01:39

So, you said you first read about it in 2002. When did you first come across a real-life example?

Kennedy

01:46

I went on a vacation and when I came back I noticed one of the recruits was missing, so I asked them what happened and they said that he had to go to the hospital, that he had a problem with his kidneys. And I said, "Well, do you know what the condition is called?" Because I had been teaching about this unicorn for a long time but I had never seen it happen, I had never seen evidence of this in any of the training that I'd been associated with. It had been in the first week of the academy, typically it happens in the first two weeks, and it was rhabdomyolysis and that was his diagnosis. He had previously been very sedentary and they did a certain number of squats that evidently manifested for him in some damage to his skeletal muscle. So, he experienced some swelling of his joints and inability to move and just an inordinate amount of discomfort, and so they took him as a normal protocol and that was his

diagnosis, so he was admitted. So that was the first time I'd ever had any experience with it and I always made sure that it was a part of the normal conversation when we were ever training any new instructors.

Donelan

03:09

Let's go a little more into that. Your interest on this subject is how it falls within the training of police officers and in training academies with law enforcement organizations. Again, this is just so fascinating. I consider myself a well-versed person in a variety of subjects especially in this day of Google and the Internet where basically any topic comes up, you'll Google it immediately, but again, this is something I've never even heard of. And the whole idea that it's caused by extreme physical exertion and physical fitness is such a big part of just the common lifestyle these days with everything from like spin classes to PDX or XP, those extreme workout classes that you read about and hear about or you participate in. So, just expand if you can a little more about how this is caused or what causes it or who may be at risk and how you may be at risk of it and just try to educate us more.

Kennedy

04:01

So, typically it will happen when you're doing unaccustomed or novel exercises in the first couple of sessions. It can happen during one session. A colleague of mine was telling me about a research study they were doing on a biceps curl. And they had a female, active female, college-age female come to be a subject in the study and she was doing muscle contractions to fatigue and she ended up with rhabdo just from doing it from her biceps. So, it can happen with small muscles or it can happen in a large number of muscles. Typically in an academy setting, it will happen in the first two weeks of physical activity when the recruits are unfamiliar with the exercises and when there's a high volume of exercises done. So, it's kind of a critical time for the instructors to know how to scale exercises properly. One of the issues that I believe is a contributing factor is the popularity, and there has been an increase since 2008 in the number of hospitalizations of rhabdo. And this is likely due to just an increase in the popularity of workout styles that are short duration and very high intensity. They're very effective, they provide an unbelievable result, and they can make you really fit, and they can also damage the body when they're used at the wrong time in a training program. Typically this presents itself in recruits that have the highest amount of mental compliance with verbal instruction but a moderate amount of fitness. The best way to try to avoid it is to have really good scalable instruction in the first couple of weeks of training and having their instructors understand what the signs and symptoms are so that when someone does complain of it, they're able to kind of do a further inquiry to discover what could possibly be life threatening and send them to the hospital.

Donelan

06:10

Oh my goodness. This is just a fascinating subject and just to think that one exercise done intensely could cause something like kidney problems or kidney failure. I'm personally aware that if your kidneys go, you can crash and go extremely quickly like [finger snap] that. So, you know, it seems like there's

personal knowledge, but it seems like there needs to be a lot of awareness raised with the instructors. What is out there currently for instructors to be knowledgeable and compliant with recognizing this condition and what more may be needed especially in the area where you have your niche which is within the law enforcement training agency?

Kennedy

06:50

It doesn't happen frequently. It shouldn't happen frequently. But when it does happen, it can be life threatening. And we just need to be better aware that the condition exists. And the popularity of these types of high-intensity training styles, they influence the habits of instructors that are tasked with training their academies. So, we all are going to be influenced by our own experience and so when you pick the best fit instructor who might be very highly inspired by these amazing forms of training, they implement them too early on in the program and they can send somebody to the hospital and kill them. You know, and so, does that happen a lot? I don't think it happens a lot but when it does happen it is catastrophic. And so, if it is happening a lot, it is a red flag for the training program to make wide-sweeping changes.

And what I have found in the course of me lecturing throughout the country is that over time I have people say, "One person had a problem but it was a preexisting problem with his kidneys," and they later find out, no, that was rhabdo. And if they've had it once, they are more at risk of it happening again. So, I've heard stories of other people who have suffered from it before. They don't remember the name of it. They just know that it was something wrong with their kidneys when they were in the military and they ended up being fine later on. They go back into the academy and the same thing happens to them again. They still don't know the symptoms, they still don't know the signs, and they know, "Oh, it's something wrong with my kidneys. It must've been a preexisting condition," not realizing that it's from either sickle cell trait that is undiscovered or that they just don't have a great level of hydration and they're not aggressively rehydrating and trying to scale their workouts accordingly.

When it comes to a law enforcement training perspective, it's difficult to get that information out there, to let them know that this is also something that can happen. It's another layer of complexity that we have to look at and just use that filtering system to keep screening all of our candidates. And it can happen in a specialized unit as well. So, the expectation is that in a specialized unit you will have a short-duration, high-intensity school. It takes two weeks to adjust yourself to any novel or unaccustomed exercise. So, the issue isn't necessarily that it's always the instructor's fault. The issue is we need to be better prepared to identify the signs and symptoms of when it does present itself so that we can help to save lives.

Donelan

09:35

And real quick, just to define for some of our listeners that might not know what exactly it means, what is scaling exercise.

Kennedy

09:42

Okay. So, scaling an exercise means that if I can do 100 push-ups, that doesn't necessarily mean that at the beginning of an exercise program that I can take a group of 40 people and expect them to do the same thing. If I just do 100 push-ups at my pace and I expect the entire class to be able to do 100 push-ups at my pace and rest as they need, there is a certain subsection of that class that will push themselves beyond what they feel is comfortable and sometimes they will compromise their own safety to do so. And scaling an exercise means that you have to have enough experience to be able to observe the effect that these exercises are having so that when people start breaking form and their repetitions start getting ugly or they start changing the muscles that they're supposed to be using, that they have to recalibrate themselves and get back into the right position in order to keep going.

Donelan

10:45

Interesting. Do you have a recent real-life example that would help educate our listeners more about the conditions and maybe things to watch out for or something that would educate them more about this?

Kennedy

10:55

I do. Last year I had somebody approach me that thought I was a nutritionist after giving a lecture on proper exercise and footwear and proper training techniques as well as sports nutrition. So, I was talking to them about hydration and pre- and post-workout nutrition. So, at the end of that block of instruction, one recruit asked me if, why he was having trouble eating and so I said, "Well, tell me what you mean why you're having trouble eating?" And he said, "Well, yesterday I was unable to eat my lunch. I usually have a strong drive to eat but I couldn't eat my lunch. And then after work I went and got some more food and I couldn't eat it. So, this morning I started vomiting water." And I said, "You know, you could be dehydrated. Have you been drinking water?" And I knew that this was in the first week of the academy. He was at, and any time you're asking these questions, I'm going down the list of do you have any stiffness in your muscles, do you have any swelling of your joints, have you had a change in your urine output—so, reduced urine output, no urine output or a darkened color of your urine. Using that as an example is usually the one that people remember but it only happens in a certain percentage of people who actually develop rhabdo, so it's not the only marker but it's the one that most people remember. And so, he said that he did have a darkened color of his urine, that it had been that way for three days and that he had been drinking beet juice. And beet juice can sometimes change the color of your urine, so it was difficult for him to discern what that was from, he attributed it to the beet juice. And I felt like he had enough signs and symptoms to screen him into the hospital and I thought that he needed to be looked at by a physician and he was admitted for two weeks and three days and he was released only to be able to do outpatient dialysis for an additional two months.

Jennifer
13:08
Oh my gosh.

Kennedy
13:09
By the time he got to the hospital— and he felt fine, his physical presentation was fine, he had no pain, his instructor felt he looked fine and neither of them felt like he needed to go to the hospital, I felt like it was, he had enough of the signs and symptoms to flag him for the possibility of this. He ended up not having sickle cell trait but he, when he got to the hospital they said that his system was not functioning any longer and that he could have died within hours. So, vomiting is one of like an extreme example of what can happen when your kidneys stop functioning.

Donelan
13:55
So, so this is really important. If any of our listeners want to find out more information about this, is it appropriate for them to contact you?

Kennedy
14:02
Yeah. They can e-mail me.

Donelan
14:05
And that would be at kelly, K-E-L-L-Y, @Fit-to-Enforce.com?

Kennedy
14:18
Yes.

Donelan
14:19
Fantastic. We will list that on our appropriate materials that go along with this podcast. For our listeners out there, are there any closing thoughts you might have.

Kennedy
14:22
I think that it's important just to use all of the resources available so that they can constantly make themselves aware when they learn about something that they could to improve the quality of training. Even if they think that it's never happened, the moment that they read all of the signs and symptoms and they know that people can be hospitalized or have some sort of dialysis from this, that maybe they can go back and think, "Has this really ever happened to us?" Because it probably has. If they're working in an academy setting, it's probably surfaced at least once or twice if they have a lot of volume. So, I just

think that it's great to keep kind of sharpening your skills and trying to improve the quality of training that we have to offer to all of our budding law enforcement academies.

Voiceover: *The Beat* Exit

15:16

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Voiceover: Disclaimer

16:15

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