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Chad Rairdon

Brian Dykhuizen

Erika Smith-Goodwin

Paul Sparling

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## ***Athletic Trainers' Knowledge and Treatment of Athletes with Paroxysmal Dystonia/Dyskinesia***

Chad Rairdon†; Brian Dykhuizen MS, AT, ATC†; Erika Smith-Goodwin PhD, AT, ATC†; Paul Sparling MEd, AT, ATC€

†Wilmington College; €Cincinnati Bengals

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### **BACKGROUND**

Paroxysmal Dystonia/Dyskinesia as defined in the journal *Movement Disorders* is “A movement disorder characterized by sustained or intermittent muscle contractions, causing abnormal, often repetitive, movements, posture or both.”<sup>1(13)</sup> Typically Paroxysmal dystonia involves a genetic mutation. The most predominant are Proline-Rich Transmembrane Protein 2 (PRRT2), Myofibrillogenesis Regulator 1 (MR-1), Glucose Transporter 1 (SLC2A1), and ECHS-1. PRRT2 is the highest occurring mutation which is around 74.8% according to *Paroxysmal Dyskinesias Revisited: A Review of 500 Genetically Proven Cases and a New Classification*.<sup>2(1109)</sup> PRRT2 gene mutation has an onset of puberty and the episodes usually tend to decline as the patient becomes older, eventually resolving sporadically.<sup>2(1111)</sup> The function of this protein is unknown, although it is thought to be involved in signaling in the brain.<sup>3</sup> The MR-1 gene seems to be an indication on PNKD. About one third of patients have reported that the attack has started in one limb, but could eventually become generalized.<sup>2</sup> In addition; MR-1 gene mutations seem to have certain triggers which are coffee, tea and/or alcohol.<sup>2</sup> SLC2A1 provides instructions for producing a protein called the glucose transporter protein type 1 (GLUT1). The GLUT1 protein is embedded in the outer membrane surrounding cells, where

it transports glucose into cells from the blood or from other cells for use as fuel.<sup>4</sup> The GLUT1 protein also transports glucose between the glial cells in the brain, which protect and maintain the neurons.<sup>4</sup> Different types of Paroxysmal Dystonia are Paroxysmal Kinesigenic Dystonia (PKD), Paroxysmal non-kinesigenic Dystonia (PNKD). And Paroxysmal Exercise Induced Dystonia (PED). PKD is triggered by rapid movement and “the attacks are brief, lasting seconds.”<sup>5(1160)</sup> PED is defined as “not brought on by sudden movements but by physical exhaustion after continuous exertion.”<sup>5(1161)</sup> The most common treatment for paroxysmal dystonia is putting the patient on some type of antiepileptic; usually Carbamazepine.

### **OBJECTIVE**

The purpose of this study was to determine Certified Athletic Trainers (ATC) awareness of Paroxysmal Dystonia (PxD). PxD is defined as an episodic movement disorder in which abnormal movements are present only during attacks.

### **DESIGN and SETTING**

This study used a survey research design conducted at a DIII college in Ohio.

### **PARTICIPANTS**

The return rate was 62% (n=26) with a convenience sample target population of N=42. 50% (n=13) of the population males

were and 50% (n=13) were females. 50% (n=13) were between the ages of 22-30, 15.4% (n=4) were between the ages 31-40, 15.4% (n=4) were between the ages 41-50, 51-60 (n=4) 15.4%, and 61+ (n=1) 3.8%. The subjects years in the athletic training profession were 1-5 (n=11) 42.3%, 6-10 (n=4) 15.4%, 11-15 (n=3) 11.5%, 16-20 (n=2) 7.7%, 20+ (n=6) 23.1%.

### **INTERVENTIONS**

The research was approved by the College Institutional Review Board. Content validity was established through the Table of Specification (ToS). Face Validity was established through a panel of experts. Descriptive statistics (percentages and frequencies) were used for all applicable items. Chi-square test was used for gender as a grouping variable. Kruskal- Wallis test was used for the age and years in profession as a grouping variable. There was no statistically significant data. SPSS 24.0 was used to analyze the data.

### **MAIN OUTCOME MEASUREMENTS**

The survey asked 16 questions. Questions 2-5, 7, 8, 10-13 used a 5-point Likert scale. (Strongly Agree<sup>5</sup>, Agree<sup>4</sup>, Neutral<sup>3</sup>, Disagree<sup>2</sup>, Strongly Disagree<sup>1</sup>), Question 1 used a two-point Likert scale (No<sup>2</sup>, Yes<sup>1</sup>) Question 6 used a 4-point Likert scale (Doctorate<sup>4</sup>, Masters<sup>3</sup>, Bachelor<sup>2</sup>, Associates<sup>1</sup>). Question 9 used a 4-point Likert scale (High School<sup>4</sup>, Collegiate<sup>3</sup>, Professional Teams<sup>2</sup>, Other<sup>1</sup>). Question 14 used a 2-point Likert scale (Male<sup>2</sup>, Female<sup>1</sup>). Question 15 used a 5-point Likert scale (22-30<sup>5</sup>, 31-40<sup>4</sup>, 41-50<sup>3</sup>, 51-60<sup>2</sup>, 61+<sup>1</sup>). Question 16 used a 5-point Likert scale (1-5<sup>5</sup>, 6-10<sup>4</sup>, 11-15<sup>3</sup>, 16-20<sup>2</sup>, 20+<sup>1</sup>).

### **RESULTS**

The population in the study was 50% (n=13) males and 50% (n=13) females. The majority of subjects had at least 1-10 years of experience 57.7% (n=15). 65% of the

population was between the ages of 22-40. 96.2% (n=25) of the subjects said the disagreed on seeing and treating a case of PxD. 85% (n=22) of the subjects said they were curious to do research on PxD. 88% (n=21) of subjects said they couldn't describe PxD and they couldn't help the patient with more knowledge. Only 8% (n=2) of subjects disagreed that PxD needs to be known at any clinical setting. 0% (n=0) said that they felt confident in their ability to recognize the signs and symptoms of PxD. The subjects curiosity to increase their knowledge and go through research to find out more about PxD was 85% (n=22). 11.5% (n=3) responded that they did not believe that they as a clinician could adequately treat a patient with PxD. There was no statistically significant data.

### **LIMITATIONS**

Limitations of my study include sample size, having a 15 week semester to complete the initial research, questions that could have been more direct and worded more appropriately.

### **CONCLUSION**

Although PxD is a rare condition, it is satisfying as an AT to help an athlete who has an undiagnosed medical condition. By monitoring the chief complaints (CC) and referring you will appropriately help the athlete. Do not dismiss the patient and the unusual grouping of signs and symptoms they may present. PxD is another condition that we can add to our ever expanding knowledge. There is always something new and exciting out there and that is why we, as ATs should have a passion to continue learning.

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**KEY WORDS:** *paroxysmal dyskinesia, paroxysmal non-kinesigenic dystonia, paroxysmal kinesigenic dystonia, paroxysmal dystonia*