Heart arrhythmias are not uncommon in Standardbred racehorses immediately following races

**What is this research about?**
In the Standardbred racing industry, poor racing performance and sudden death in horses are problems that have been linked to heart arrhythmias. “Arrhythmia” describes a group of medical conditions that involve irregular heartbeats caused by problems with the electrical activity of the heart. Ventricular arrhythmias (which arise in one of the two large chambers of the heart) are thought to be a primary cause of sudden death following intense exercise, but this is impossible to confirm by autopsy. Little research has been done to describe normal heart rhythms and the occurrence of non-fatal arrhythmias in horses exercising at maximum effort, especially under “real world” racing conditions. Similarly, little is known about how non-fatal arrhythmias may affect race performance. A better understanding of the “normal” range of heart rhythms, both during maximum effort and afterwards in the recovery phase, can help scientists learn more about the causes of sudden death.

**What did the researchers do?**
The heart rhythms of 288 different Standardbred horses were recorded before, during, and after regularly scheduled harness-racing events using an ECG (electrocardiogram) attached to each horse’s harness. The races were chosen so that monitoring included racehorses of all ages, gaits (pacing or trotting), purse sizes, and race types (intact males, gelded males, females). Other data were collected including the horse’s lifetime earnings, finishing position, and race time. Afterwards, the ECG data were visually checked for any and all arrhythmias and intervals between beats were then analyzed using a computer software program.

**What you need to know:**
Complex ventricular arrhythmias (CVA) were fairly common in Standardbred racehorses during the recovery period following races. Race conditions causing unusual demands (like attempting to take the lead or get back onto gait), harness racing at a trot, and punctuated deceleration (PD) are risk factors.
What did the researchers find?

In total, usable ECG recordings during the race were collected from 302 individual horse-race events. No problems with heart rhythm were detected before or during maximum effort, except for a few isolated cases of extra beats. In the immediate post-race recovery period, nearly 28% of recordings showed some sign of heart arrhythmia. In 16% of recordings, potentially life-threatening complex ventricular arrhythmias (CVA) were identified. 12% of post-race recordings showed sudden fluctuations in heart rate known as punctuated deceleration (PD). Increased risk for CVA was found in horses with PD, horses “parked” at the ½ mile spot (one or more horses between it and the inside rail), and trotters “breaking” gait in the final stretch.

How can you use this research?

**Racehorse owners and trainers** can use this research to better understand the role cardiac arrhythmias may play in poor racing performance and sudden death in racehorses.

**Veterinary scientists** can further this research by studying how heart rhythms are affected by different post-race cool-down techniques, as well as by studying the role of genetics in causing heart arrhythmias.

About the University of Guelph researcher:

Peter Physick-Sheard is an Associate Professor in the Department of Population Medicine, in the Ontario Veterinary College, at the University of Guelph. Email: pphysick@uoguelph.ca.

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