

AMERICAN SOCIETY OF SAFETY ENGINEERS NORTH FLORIDA CHAPTER

MARCH 2016 NEWSLETTER

Can Low Heart Rate Predict Unsafe Behavior?

Do you have an employee who consistently refuses to follow safety rules no matter what? Do you have another who gets hurt much more often than the norm? An interesting theory may partially explain why he or she behaves this way.

An article in *livescience* written by Rachael Rettner examines a study from Sweden that suggests teens who have a low resting heart rate may be at increased risk of committing violent crimes as adults. In this Swedish study, the researchers analyzed information from more than 710,000 men who had their heart rate measured when they were about 18 years of age. This was part of a test for military service that was mandatory in Sweden until 2009.

The Swedish researchers divided the men into five groups based on the rate that their heart was beating while at rest. They found that the men in the group with a rate of 60 beats per minute or less were 39 percent more likely to be convicted of a violent crime over the following few decades as compared to the men in the group with a rate of 83 beats per minute or more. The violent crimes that were

committed by these men included murder, assault, robbery and arson.

The findings of the Swedish researchers held even after they took into account factors that might affect resting heart rate. These factors included height, weight, cardio-fitness level, as well as factors that might affect a person's risk of committing violent crimes, such as his socioeconomic status.

Interestingly, the study also found that men with the lowest resting heart rates were more likely to be convicted of nonviolent crimes, 25 percent more in fact. Additionally, as compared to the group of men with highest resting heart rates, this group was found to be 39 percent more likely to be injured by an assault or incident such as an automobile accident.

These findings agree with previous research conducted with children that linked a low resting heart rate with anti-social behaviors. "Our results confirm that, in addition to being associated with aggressive and antisocial outcomes in childhood and adolescence, low [resting heart rate] increases the risk for violent and nonviolent antisocial behaviors in adulthood," the researchers, from the University of Helsinki, wrote

in the journal *JAMA Psychiatry*.

So, you may ask, what does heart rate have to do with how people conduct themselves? Well, there are at least two theories as to why having a low resting heart rate may increase the risk of violent behavior. One postulates that people with a low resting heart rate have abnormally low levels of what psychologists call arousal, which is the feeling of being awake and alert. Therefore, the researchers stated, it could be that this group of people seek out stimulating experiences, such as risky behaviors and crime, to boost their arousal.

A second theory is that the people with a low resting heart rate have less of a reaction to mildly stressful experiences. Therefore, they are more fearless and less afraid of risks and the consequences that come with them.

However, the researchers said, this study does not provide evidence for one theory over the other. Additionally, the study found only an association, not proof, that a low resting heart rate can bring about violent behavior. The researchers concluded that other factors, such as genetics and the environment, very likely play a role and should be studied.

In an editorial that accompanied the study,

professor Adrian Raine, who studies the neuroscience of anti-social behavior at the University of Pennsylvania, wrote that the findings of this study raise wider questions. Specifically, taking into account the physiological conditions encountered in the study, to what extent is a person responsible for their behavior?

On the one hand, Mr. Raine noted, the men in the study were at increased risk for injury by assault, which many people would see as not being their fault. He proposes that they can hardly be blamed for having a low resting heart rate that puts them at risk. Further, he postulates, if we accept this logic, should the legal system in turn accept low resting heart rate as a mitigating factor for the commission of serious violence?

Mr. Raine said that the new findings "put the case beyond reasonable doubt," that a low resting heart rate increases a person's risk of committing future crimes.

However, Dr. Brandon Korman, chief of neuropsychology at Nicklaus Children's Hospital in Miami, disagreed. He said that the effect of resting heart rate on violent crimes found in the study was so small that it was not meaningful. Dr. Korman pointed out that, among men with the highest resting heart rate, 5 percent committed violent crimes in adulthood, compared with 5.8 percent of men with the lowest resting heart rate. That is less than half a percentage point difference. And, as Dr. Korman pointed out, although the finding was

statistically significant, "in the real world, it has very little meaning."

Korman continued by saying that people should be careful how they interpret the findings because they have potentially dangerous implications. "You can't start predicting who is going to be a criminal offender based on a 0.8 percent difference between the highest and the lowest groups," he said. Moreover, he continued, there are likely other environmental factors that play a role in the link.

Still, Dr. Korman pointed out, the effect of resting heart rate on unintentional injuries was larger. Approximately 36.5 percent of men with a low resting heart rate experienced unintentional injuries; this is compared with about 30 percent of men with the highest resting heart rate. This finding would, Dr. Korman said, be in line with previous studies that found that people with lower heart rates tend to be greater risk-takers.

As a final note, the researchers pointed out that the Swedish study did not include women; thus, the results apply only to men. So, the next time that you observe that one (male) employee refusing to buy into the safety program or taking an undesirable risk, check their pulse.

Bob Dooley

Next ASSE Local Chapter Meetings

April 27 - Worker's Memorial Day,
10:00 a.m. to noon
FSCJ Downtown Campus

May 18 - Fall Protection for General
Industry & Construction,
YMCA Riverside

Please RSVP to Steve Wilson at
steven_wilson1@me.com.

Article Sources and Hyperlinks of Interest

<http://www.livescience.com/52126-heart-rate-violent-crimes.html>

<http://www.newyorker.com/tech/element/s/calm-hearts-bad-behavior>

<http://archpsyc.jamanetwork.com/article.aspx?articleid=2436277>

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