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Depression and Heart Rate Variability

Have you ever felt so anxious or depressed about something that your heart feels like it's going a million miles per hour? Well it's not, but your heart rate does increase rapidly when you experience anxiety or depression. However your heart rate variability can decrease significantly. Over 31.1% of adults in the U.S. experience anxiety and about 29.0% experience depression. This is a large percentage of people that struggle with a mental disorder and though it creates a major effect on one's psychological health, it plays an effect on one's physical health specifically the heart. For my independent project, I will be discussing the findings from different publications to explain the effects that anxiety and depression have on one's heart rate variability as well as different treatments.

To begin, I will explain the important aspects of heart rate variability and when it is considered normal. Heart rate variability is known as the variation in time between each heartbeat. The variation is under the control of the autonomic nervous system consisting of the sympathetic and parasympathetic nervous systems which regulate our heart rate and other components in our body. Heart rate variability is present in those that are healthy, but it plays a big role in indicating if there is a health problem present such as a heart condition and especially anxiety and depression. In order to measure heart rate variability, the most common and efficient method is electrocardiography. Having a higher heart rate variability indicates good

cardiovascular health compared to a lower rate that shows association with health conditions, aging, sedentary lifestyle, and stress. Different factors that can help improve a low heart rate variability could be exercising regularly, practicing relaxation techniques, and finding different ways to manage stress levels.

Depression and the heart are interconnected, meaning they connect with one another in the way that depression has a big effect on cardiovascular health. Depression creates an impact on the autonomic nervous system which regulates the involuntary functions of our body which include heart rate. Depression can also create chroming inflammation which is then implemented in the development of cardiovascular diseases.

There were a few different publications that I found that gave me a broader explanation as to how heart rate variability, depression, and anxiety tie together. A publication by the Cleveland Clinic titled “Heart Rate Variability (HRV)” introduced what it was and how heart rate variability is able to reflect how your body can adapt. It explains how having a highly variable heart rate indicates your body’s ability to adapt to multiple forms of changes. As I stated being before a high rate shows normality and this publication adds that it means the person tends to be less stressed and happier. A lower rate is not good but is found more in those dealing with anxiety and depression.

In another study by the National Library of Medicine called “Heart Rate Variability as Indicator of Clinical State in Depression”, the method included taking 62 depressive individuals that were not on antidepressant medication before beginning the assessment and 65 individuals that were in the healthy control group. Those with depression had their resting ECGs recorded for 15-minute blocks each then 2 days after they were put on antidepressants and after 2 weeks their ECGS were recorded again. The results concluded that after being on antidepressants those

that had depression had a change in HRV parameter values that correlated with changes in symptom severity of depression. This indicates that after being put on the prescription their heart rate variability had increased. Based on the results the reason why depression has this effect is due to a reduced ability of the parasympathetic nervous systems ability to regulate the heart through vagal activity.

A different study by the National Library of Medicine called “Heart rate variability as predictive factor for sudden cardiac death”, explained how in previous decades cardiovascular morality was seen being reduced significantly due to high income countries being able to provide more preventive measures and how before there used to be about 17 million deaths every year due to different cardiovascular diseases. This study brought to light the fact that low heart rate variability has shown to be independently predictive of increased morality.

As I mentioned earlier there are ways to improve a low heart rate variability, a publication from Science Direct called “Intervention methods for improving reduced heart rate variability in patients with major depressive disorder: A systematic review and meta-analysis” goes into more detail about the different methods someone with major depressive disorder can do to improve their heart rate variability. This publication explains how 21 different studies involving 2250 patients that had been diagnosed with major depressive disorder and 1982 healthy controls were performed in order to gain these results. Different treatment options were given to the individuals and their heart rate variability was compared from before starting treatment to after starting treatment. Based on the results the treatment that worked most efficiently and showed an increased heart rate variability especially in those diagnosed with depression was pharmacotherapy. The results showed that a 2-week routine antidepressant treatment significantly increased heart rate variability. However physiotherapy, psychotherapy,

and exercise therapy didn't seem to have much effect or any effect for that matter, but they did help decrease the depressive symptoms of the patients.

In conclusion, heart rate variability plays a big effect on ones cardiovascular health and if a person has a low heart rate variability it could be due to many different reasons but depression and anxiety have an even bigger impact on the decrease. This is very dangerous and can have long-term consequences if it isn't managed. That is why bringing more awareness and understanding to this topic is very important. As a person who has struggled with depression in the past, I never realized depression could do more harm than just to the mind and this makes me think that others may not realize it either. These publications shed more light and knowledge for those to really understand the capabilities depression can have on heart rate variability and how to prevent it from contributing to more damage.

Works Cited

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