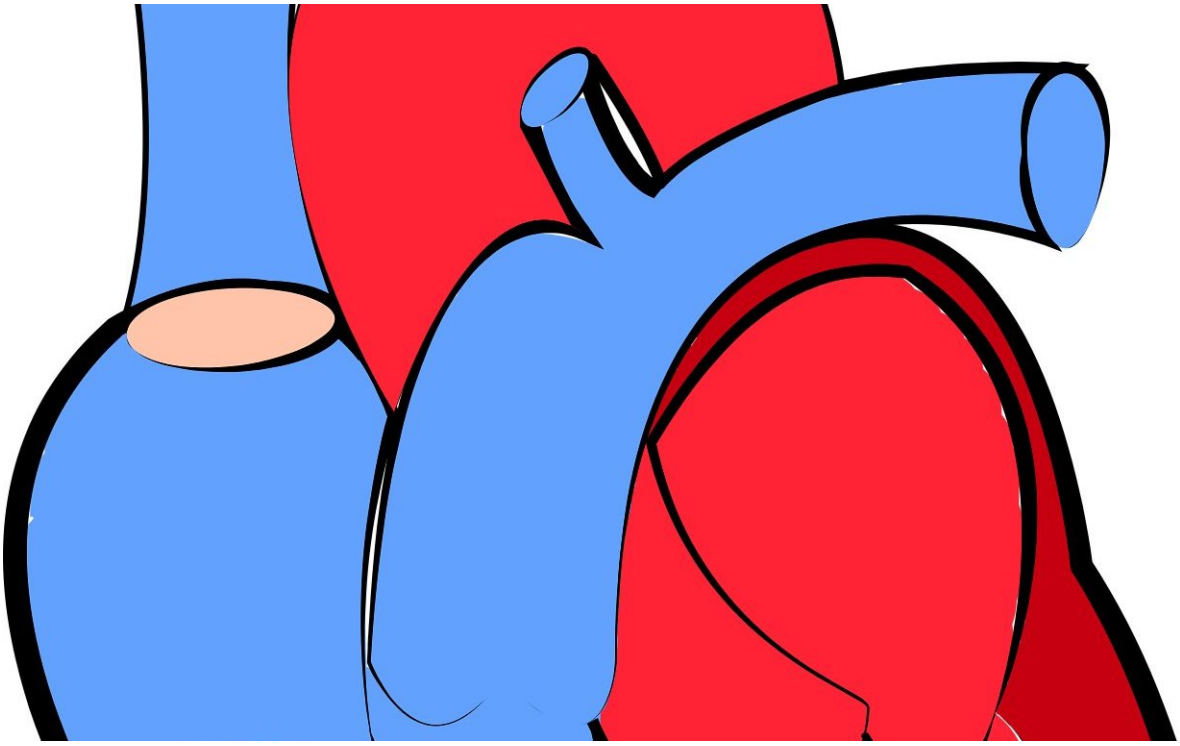
Premature hearts less able to cope with exercise

March 19 2018



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The hearts of people born prematurely are less able to cope with the pressures of exercise in adulthood, according to a new study published in the *Journal of the American College of Cardiology* and part-funded by the British Heart Foundation.

The findings might explain why people born prematurely are more likely to develop heart failure in later life.

In the UK in 2016, more than 60,000 babies were born prematurely, accounting for around 8 per cent of all live births. Globally, these rates range from 5 to 18 per cent.

While we know that those born prematurely are more likely to suffer with heart conditions as adults, researchers are yet to fully understand the biological reasons for this.

To tackle this question, researchers at the University of Oxford compared the heart function of 47 adults who were born prematurely (before 37 weeks) with 54 people who were carried to term (37 weeks or later). They were particularly interested in how the volunteers' hearts responded to exercise.

They found there was little difference in the heart's performance while the participants were resting. When people born prematurely used an exercise bike at moderate exercise intensities, however, the percentage of blood leaving the heart during each heartbeat (ejection fraction) was on average 7.3 per cent lower than that of people who were carried to term.

The more prematurely a person was born, the lower the capacity of the heart to pump blood during exercise.

During exercise, the heart rate normally increases, along with the amount of blood pumped out of the heart by the left ventricle (also known as the stroke volume). However, the team found that the hearts of people born prematurely were less able to make these changes in response to exercise. In the earliest stages of exercise, the increase in heart rate and stroke volume was 56 per cent lower in those born prematurely

compared to those who were carried to term.

The researchers believe that this finding may help to explain why people born prematurely are at greater risk of developing heart failure, when the heart muscle does not have enough strength to pump blood around the body.

The team are now looking at whether an exercise programme for young adults who were born prematurely helps the heart to cope better with exercise and reduces the risk of future heart failure.

Dr Adam Lewandowski, BHF Research Fellow at the University of Oxford and lead investigator on the study, said:

"Thanks to advances in modern medicine, there are a huge number of people alive today who were born prematurely. But we're only just beginning to understand the impact this start in life has on the heart.

"By unpicking the mechanisms that link premature birth to heart failure, we hope to develop strategies to keep this population healthier for longer."

Professor Jeremy Pearson, Associate Medical Director at the British Heart Foundation, said:

"Neither expecting parents, nor people who know they were born prematurely should let these findings worry them. Most babies born prematurely will live long and active lives, and won't go on to develop heart failure as adults.

"But the results do shed light on the way our hearts develop and how this could be different if you're born prematurely. The research also offers us new ideas for how we can help these people to protect their hearts for a

lifetime.

"By understanding how the heart is affected by premature birth, we may be able to better identify people at risk of heart problems so they can be treated proactively, for example, by recommending exercise training and helping them to maintain healthy blood pressure and cholesterol levels."

Odaro J. Huckstep, PhD student at the University of Oxford and first author of the manuscript, said:

"Many factors contribute to our overall heart health. In recent decades, we have learned a good deal more about some factors like blood pressure and family history. We know less about how preterm birth relates to heart health and are trying to change that through our research.

In many ways, our health is like a card game. Having a good hand can have a lot to do with how we play our cards. We are working to advance the understanding of how preterm birth relates to heart health so that we can help identify the best ways to optimize health and also minimize risk. We hope this will help a lot of people to play their cards well, and also enjoy the game.

More information: 'Physiological Stress Elicits Impaired Left Ventricular Function in Preterm-Born Adults', *Journal of the American College of Cardiology*, 2018.

Provided by British Heart Foundation