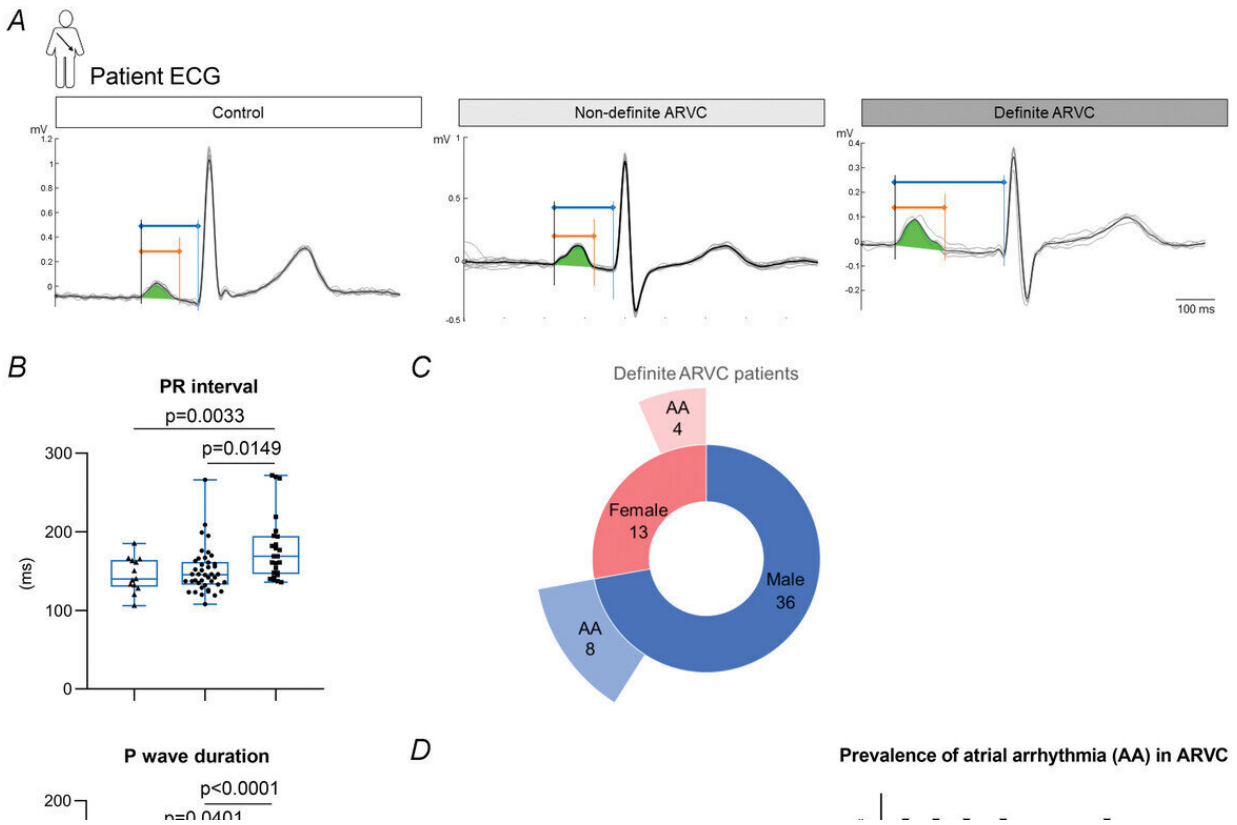


Exploring how anabolic steroid use can increase heart disease risk

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A, lead II ECG recordings from an unaffected individual (control) and a non-definite and definite ARVC patient. Individual cardiac cycles over a duration of 10 s (gray traces) are overlaid by detected R waves and averaged (black trace). The PR interval (blue), P wave duration (orange) and P wave area (green) are marked. B, PR interval (box plots with medians indicated) and P wave characteristics (means \pm SD indicated) obtained from semi-automated analysis of the averaged ECG. Heart rate (mean \pm SEM): control, 73 ± 3 beats/min; non-definite ARVC, 75 ± 2 beats/min; definite ARVC, 60 ± 3 beats/min. P-values

from post hoc tests are reported on the graphs [Kruskal–Wallis (P The Journal of Physiology (2024). DOI: 10.1113/JP284597

People using anabolic steroids could be increasing their underlying risk of a heart condition called atrial fibrillation, a new study has found.

The new research published in [The Journal of Physiology](#) was conducted by an interdisciplinary consortium of clinicians and researchers led by the University of Birmingham and collaborators in Germany.

The team found that male sex hormones, such as testosterone, also called androgenic [anabolic steroids](#) (AAS), which are misused for muscle building, particularly among young men, can increase the risk of [atrial fibrillation](#) in individuals genetically predisposed to heart diseases.

Dr. Laura Sommerfeld, a Postdoctoral Researcher at the UKE Hamburg, who completed her Ph.D. at the Institute of Cardiovascular Sciences at the University of Birmingham focusing on this work, is the lead author of the study.

Dr. Sommerfeld said, "Our study can significantly contribute to understanding the impact on the heart health of young men who misuse anabolic steroids to increase [muscle mass](#). Recent reports have shown that young men, in particular, are being targeted on social media such as TikTok being sold testosterone products, but we have shown how the misuse of steroids carries a specific risk that many people will not be aware of."

Professor Larissa Fabritz, Chair of Inherited Cardiac Conditions at UKE Hamburg and Honorary Chair in the Institute of Cardiovascular Sciences at the University of Birmingham, added, "Heart muscle diseases like

ARVC affect young, athletic individuals and can lead to life-threatening heart rhythm disturbances. Atrial fibrillation is a common condition in the general population. Elevated [testosterone levels](#) can result in an earlier onset of these diseases."

The scientists examined potential effects on a condition called arrhythmogenic right ventricular cardiomyopathy (ARVC), which is genetically determined and primarily attributed to disruptions in the formation of cell connections critical for heart muscle stability.

The scientists initially confirmed, based on clinical patient data from UHB and elsewhere, that ARVC occurs more frequently and severely in men than in women. In laboratory experiments, they discovered that six weeks of AAS intake, combined with impaired cell connections, could lead to reduced sodium channel function in heart tissue and a slowing of signal conduction within the atria.

Dr. Andrew Holmes, co-author and Assistant Professor in the Institute of Clinical Sciences at the University of Birmingham, said, "This work implies that young male individuals with key inherited genetic changes have a greater risk of developing electrical problems in the heart in response to anabolic steroid abuse."

More information: Laura C. Sommerfeld et al, Reduced plakoglobin increases the risk of sodium current defects and atrial conduction abnormalities in response to androgenic anabolic steroid abuse, *The Journal of Physiology* (2024). [DOI: 10.1113/JP284597](https://doi.org/10.1113/JP284597)

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