Circulation: Largest genetic and MRI study carried out to date rules out the existence of heart disease

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Left ventricular hypertrabeculation, an anatomical feature of the heart traditionally linked to higher risk, does not worsen outcomes in patients with dilated cardiomyopathy

A team from the Centro Nacional de Investigaciones Cardiovasculares Carlos III (CNIC), working with a large international network of hospitals and research centers, has shown that left ventricular hypertrabeculation—an anatomical feature of the heart long associated with poor prognosis—does not lead to worse outcomes in patients with dilated cardiomyopathy.

The study was led by Dr. Pablo García-Pavía, head of the Inherited Cardiomyopathies Group at the CNIC, cardiologist at Hospital Universitario Puerta de Hierro, and researcher with the Spanish cardiovascular research network (CIBERCV).

The analysis, conducted in 1,160 patients from 22 centers in Spain and the Netherlands, found that the presence of hypertrabeculation is not associated with an increased risk of embolic events, advanced heart failure, or severe ventricular arrhythmias.

The findings, published in *Circulation*, indicate that this feature should be considered a morphological trait within dilated cardiomyopathy rather than a distinct clinical entity requiring specific management.

Left ventricular hypertrabeculation has long been a subject of debate in cardiology. For years it was classified as a separate disease, known as left ventricular noncompaction cardiomyopathy. More recently, however, it has been proposed that it is not a disease in itself, but rather an anatomical feature characterized by an increased number and/or thickness of trabeculae—small muscular structures lining the inner surface of the left ventricle.

Historically, **hypertrabeculation** has been linked to an increased risk of heart failure, arrhythmias, and thromboembolic events, leading in some cases to recommendations for more aggressive treatment, including preventive anticoagulation to avoid clot formation within the hypertrabeculated regions.

However, the new study provides conclusive evidence to resolve the long-standing controversy over whether hypertrabeculation is a disease entity.

After a mean follow-up of more than five years, patients with hypertrabeculation showed a clinical course similar to that of patients without this feature. “The factors that truly determined prognosis were already well known, such as left ventricular ejection fraction, the presence of myocardial fibrosis detected by cardiac MRI, and certain genetic alterations,” explains Dr. García-Pavía.

One of the most important findings is that hypertrabeculation does not increase the risk of cerebral or systemic embolism, even in patients with significantly reduced cardiac function and no atrial fibrillation. “This result calls into question the need for preventive anticoagulation based solely on the presence of hypertrabeculation,” says **Dr. Nerea Mora**, cardiologist at Hospital Puerta de Hierro and first author of the study.

The genetic analysis also showed that the frequency of hypertrabeculation varies depending on the underlying genetic cause of the disease. Nevertheless, “the presence of hypertrabeculation did not modify clinical risk in any of the genetic subgroups analyzed, confirming that it does not confer a worse prognosis,” adds Dr. Mora.

The authors emphasize that this is the largest study to date of patients with dilated cardiomyopathy characterized using both cardiac magnetic resonance imaging and genetic analysis, two essential tools for understanding the heterogeneity of the disease.

Overall, the results support considering hypertrabeculation as a phenotypic feature of dilated cardiomyopathy, without independent prognostic value and without specific therapeutic implications.

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- Mora-Ayestarán N, Ramos-Lopez N, Ochoa JP, Yuan Ibargoyen A, Claver-Garrido E, Gómez-González C, Amin AS, Gallego-Delgado M, Casas-Masnou G, Navarro-Peñalver M, Larrañaga-Moreira JM, García-Pinilla JM, Bermudez-Jimenez FJ, Mogollón-Jiménez MV, Cabezón-Villalba G, Bayes-Genis A, Climent-Payá V, Salguero-Bodes R, García-Álvarez A, Brion M, Brugada R, Zorio E, Ripoll-Vera T, Peña-Peña ML, Royuela A, Sánchez M, Diez-Lopez C, Rodríguez González E, Poel E, Villacorta E, Limeres-Freire J, Sabater-Molina M, Barriales-Villa R, Lacuey-Lecumberri G, Di Marco A, Espinosa-Castro MA, Bezzina CR, Rodríguez-Palomares JF, Basurte-Elorz MT, Mirelis JG, Garcia-Pavia P. Left Ventricular Hypertrabeculation and Prognosis in Dilated Cardiomyopathy. Circulation. 2026;154(5). doi:10.1161/CIRCULATIONAHA.125.078536.

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