Basic Research in Cardiology: A CNIC study shows that the heart can be protected during chemotherapy without reducing antitumor efficacy

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The study shows that a simple, non-pharmacological technique known as remote ischemic conditioning (RIC) can protect the heart during treatment with anthracyclines

Advances in cancer treatment mean that more people than ever are surviving the disease. However, some of the most effective anticancer drugs—a class of medicines called anthracyclines—can cause serious damage to the heart. In some patients, this cardiac damage appears months or even years after treatment and has a major impact on quality of life.

Protecting the heart without compromising the effectiveness of chemotherapy is a major challenge in the field of cardio-oncology. Now, a team at the Centro Nacional de Investigaciones Cardiovasculares (CNIC), led by Dr. Borja Ibáñez, provides new evidence that this can be achieved.

The study, published in *Basic Research in Cardiology*, demonstrates in an experimental model that the heart can be protected during anthracycline treatment using a simple, non-pharmacological technique known as remote ischemic conditioning (RIC), without reducing chemotherapy's antitumor effectiveness.

RIC consists of controlled, brief interruptions of blood flow to a limb, usually achieved by applying a pressure cuff similar to those used to measure blood pressure. This stimulus activates protective mechanisms in the body that help the heart better withstand subsequent stressors, such as the damage caused by certain cancer treatments.

In the study, the researchers used anthracycline-treated, tumor-bearing mice to model the clinical situation in cancer patients. The results show that animals receiving RIC maintained better cardiac function during treatment. Importantly, this cardioprotective effect was not associated with increased tumor growth or reduced antitumor efficacy of chemotherapy.

The study's first author, **Anabel Díaz Guerra**, a CNIC predoctoral researcher funded by the Spanish Association Against Cancer (AECC), explains: "Showing that the heart can be protected without compromising cancer treatment is essential to developing safer therapies."

These results align with the translational vision of the group led by Dr. Borja Ibáñez—CNIC Scientific Director, cardiologist at Fundación Jiménez Díaz, and principal investigator in the CIBERCV network—which is currently coordinating the European clinical trial RESILIENCE. The trial is evaluating whether RIC can protect the hearts of cancer patients treated with anthracyclines and reduce long-term cardiovascular complications.

Senior CNIC investigator **Dr. Laura Cádiz**, co-supervisor of Díaz Guerra's thesis, notes that the findings "reinforce the idea that simple, non-invasive strategies can play a key role in cardiovascular protection for cancer patients and open new avenues to improve their quality of life during and after treatment.

- *Díaz-Guerra A, Clemente-Moragón A, Pollán Á, López-Palomar L, Cádiz L, Ibáñez B. Remote ischemic conditioning protects against anthracycline cardiotoxicity without impairing its antitumor activity. **Basic Res Cardiol**. 2026 Feb 13. doi: 10.1007/s00395-026-01160-1. Epub ahead of print. PMID: 41686252.*

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