Title: A systematic review of miRNAs as biomarkers for chemotherapy-induced cardiotoxicity in breast cancer patients reveals potentially clinically informative panels as well as key challenges in miRNA research

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Summary: Breast cancer patients are at risk of cardiotoxic effects from the chemotherapy used in their treatment. Reliable cardiotoxicity biomarkers are needed that can identify those patients who are at risk and microRNA's (miRNA) are good candidates as such biomarkers. miRNAs are short pieces of genetic material which are released by cells as part of a signalling mechanism to other cells. They may have a variety of functions but they are often associated with increasing or decreasing the expression of certain genes. Different diseases have been found to stimulate the release of specific miRNAs and, as they can be detected in blood tests, they could be useful early indicators of a disease before symptoms occur.

This article is a systematic review of all the research to date concerning miRNAs associated with cardiotoxicity in breast cancer patients. It classifies which are the most suitable miRNAs as early indicators of cardiotoxicity. The article highlights the limited research in this field and particularly a lack of large-scale clinical studies which are essential for biomarker testing. A list of miRNAs is proposed and each is evaluated for its role within all cardiovascular system disorders and not only cardiotoxicity. The article concludes that a set of 11 miRNAs that are the most suitable for detecting cardiotoxicity resulting from the most commonly used breast cancer therapies. These miRNAs will be investigated in the CARDIOCARE clinical trial to evaluate their potential as biomarkers that can identify breast cancer patients who are susceptible to cardiotoxicity before they undergo harmful treatments.

More information:
https://cardiooncologyjournal.biomedcentral.com/articles/10.1186/s40959-022-00142-1