

Universidad de Granada

UGR researchers publish paper on effects of obesity on the development and outcome of breast cancer

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Research news

Dr. Manuel Picón-Ruiz and Dr. Cynthia Morata-Tarifa, UGR researchers currently based at the University of Miami, have published a review article in the prestigious international journal *CA: A Cancer Journal for Clinicians*. This journal has the greatest global impact from among all those indexed in the Journal Citation Reports (JCR), with an impact factor of 187,04.



Dr. Picón-Ruiz and Dr. Morata-Tarifa are postdoctoral researchers at the Sylvester Comprehensive Cancer Center of the University of Miami, and are also members of the *Advanced Therapies: Differentiation, Regeneration and Cancer Research Group* of the UGR, directed by Prof. Juan Antonio-Marchal. Their review paper featured on the front cover of the September issue of *CA: A Cancer Journal for Clinicians*.

The review analyses the results of clinical trials and scientific studies published over the last number of decades on the association between obesity and breast cancer. The paper, which the American Cancer Society has classified as a continuing education resource for doctors and nurses in the USA, is especially relevant given the unprecedented increase in obesity in recent years and its increasingly adverse effects on health.

In 2014, more than 1.9 billion adults were overweight worldwide (body mass index [BMI], 25-29.9 kg/m²), and of these, over 600 million were obese (BMI \geq 30 kg/m²). Obesity is associated both with a higher risk of breast cancer, particularly in postmenopausal women, and with worse disease outcomes for women of all ages.

The first part of the review article summarises the relationship between obesity and the development of breast cancer according to different epidemiological studies. The results of these studies indicate differences in the relationship between obesity and breast cancer development in premenopausal and postmenopausal women, and depending on the molecular subtype exhibited.

In particular, these studies demonstrate that obesity is clearly associated with an increased risk of breast cancer development, and with estrogen receptor (ER)-positive breast cancer after menopause. Furthermore, they indicate that obese women suffering from breast cancer face a greater risk of mortality, regardless of their age and molecular subtype.

The second part of this review addresses hypothesised molecular mechanistic insights that may underlie the effects of obesity to increase local and circulating proinflammatory cytokines, promote tumour angiogenesis and stimulate the most malignant cancer stem cell population to drive cancer growth, invasion, and metastasis.

In this case, it is important to highlight that the adipose tissue in obese people undergoes morphological and functional changes that lead to a chronic inflammatory milieu. In this article, the different changes on obese adipose tissue are described, such as immune cell infiltration, production of inflammatory cytokines, growth factors, estrogens, and so forth.

Lastly, the paper offers a review of recent observational studies which demonstrate that increased physical activity is associated with a lower risk of breast cancer development and better outcomes for patients suffering from the disease.

The effects of lifestyle interventions to decrease sex steroids and inflammatory biomarkers associated with worse breast cancer outcomes in obese women are also discussed. It is hoped that several ongoing lifestyle intervention trials will support the systematic incorporation of weight loss intervention strategies into care for patients with breast cancer.

Bibliographical reference:

Picon-Ruiz M., Morata-Tarifa C., Valle-Goffin, JJ., Friedman, ER., Slingerland, JM. (2017) Obesity and adverse breast cancer risk and outcome: Mechanistic insights and strategies for intervention. CA: A Cancer Journal for Clinicians. Sep;67 (5): 378-397.

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Contact details:

Dr. Manuel Picón-Ruiz

Braman Family Breast Cancer Institute at Sylvester Comprehensive Cancer Center,
University of Miami

Email: @email

Dr. Cynthia Morata-Tarifa

Braman Family Breast Cancer Institute at Sylvester Comprehensive Cancer Center,
University of Miami

Email: @email

Prof. Juan Antonio Marchal-Corrales

Department of Human Anatomy and Embryology

Phone numbers: +34958241000 / +34958249321

Email: @email