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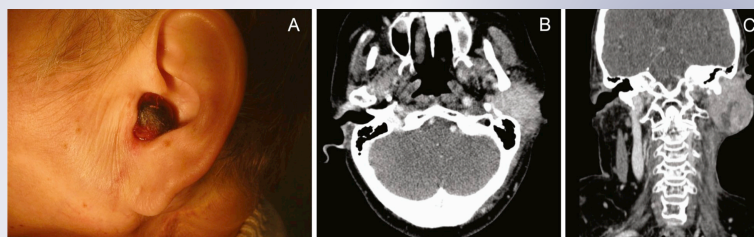
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Breast adiponcosis: a call for further research

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To date the factors that determine breast cancer (BC) incidence in obese population still remain obscure. The complex biological mechanisms driving the relationship between obesity and BC are unknown. We have previously introduced in the scientific community the term “adiponcosis” to highlight the strict connections between obesity and cancer [1]. Among the non-modifiable risk factors for aggressive BC, there are advanced stage, younger age at diagnosis, positive lymph nodes, whereas epidemiological studies suggest lifestyle as a modifiable factor that influences BC outcomes. In particular, high body mass index (BMI) has been associated with poor BC outcomes. Women who are obese at diagnosis are more likely to die for BC with respect to non-obese women. A recent study evaluated the risk in postmenopausal women [2]; the authors showed that overweight and obese postmenopausal women have a significantly enhanced risk for invasive BC, particularly for estrogen receptor-positive cancers. A BMI >35.0 means both higher risk with respect to normal weight women and higher possibility to develop poorly differentiated tumor with nodal involvement. The authors found no evidence for modification of the “breast adiponcosis” (obesity–BC association) by use of postmenopausal hormone therapy. The enhanced morbidity and mortality of obesity-associated tumors have been ascribed to high levels of hormones; a number of epidemiological studies have demonstrated that patients affected by insulin

resistance, commonly caused by obesity, have higher risk to develop several types of tumor including breast cancer; thus, chronic hyperinsulinemia, in affected individuals, may promote cancer, as insulin can exert its oncogenic potential by abnormal stimulation of multiple cellular signaling cascades, increasing growth factor-dependent cell proliferation, and/or by directly affecting cell metabolism. Additionally, BC cells interact with adipose stromal/stem cells inducing these latter cells to secrete cytokines, chemokines, and growth factors that, in turn, stimulate BC cell proliferation. In a very recent article, recommendations to follow for obesity clinical trials in cancer survivors have been raised [3]. Among studies previously performed, randomized trials have demonstrated that weight loss and physical activity interventions are feasible in cancer survivors and can improve outcomes such as body composition, fatigue, physical fitness, body image, quality of life, and biomarkers linked to cancer outcomes. In this study, it is proposed to identify unsolved gaps in clinical trials and implement studies with the potential to produce data that could lead to the incorporation of weight management and physical activity programs into standard oncology practice. Indeed, recommendations include the need for large scale trials evaluating the impact of energy balance interventions on cancer outcomes and the answer to critical questions like degree of benefit in key subgroups of survivors. Further considerations regard the need to establish lifestyle change after cancer diagnosis as a routine part of cancer care, indeed, considering the prevalence of obesity and inactivity in cancer survivors, energy balance interventions are believed to hold the potential to reduce cancer morbidity and mortality in millions of patients, not less than pharmacological tools and other interventions.

Although physiological changes related to obesity have been well characterized, how these factors influence cancer

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outcomes are still poorly understood. There is urgency to respond to open questions like obese or overweight women just need to lose weight to reduce BC risk? At which stage in a woman's life weight gain confers the greatest risk and how body's composition changes, for example, during menopause can help to predict invasive BC? Further research is required to better characterize the complex relation between obesity and BC and further investigations aimed to unveil the mechanisms of adipose tissue- BC cell interplay are urgent to allow the development of novel therapeutic targets to inhibit cancer development and metastatic spreading. On the other hand, in the light of recent studies that foresee obesity diffusion of 50 % by 2030, the prevention of obesity to avoid reaching dangerous BMI values is crucial to reduce BC risk and development.

Compliance with ethical standards

Conflict of interest Nothing to declare.

References

1. M. Bifulco, S. Pisanti, Adiponcosis: a new term to name the obesity and cancer link. *J. Clin. Endocrinol. Metab.* **98**(12), 4664–4665 (2013)
2. M.L. Neuhouser, A.K. Aragaki, R.L. Prentice, J.E. Manson, R. Chlebowski, C.L. Carty, H.M. Ochs-Balcom, C.A. Thomson, B.J. Caan, L.F. Tinker, R.P. Urrutia, J. Knudtson, G.L. Anderson, Overweight, obesity, and postmenopausal invasive breast cancer risk: a secondary analysis of the Women's Health Initiative randomized clinical trials. *JAMA Oncol.* **1**(5), 611–621 (2015)
3. J.A. Ligibel, C.M. Alfano, D. Hershman, Recommendations for obesity clinical trials in cancer survivors: American Society of Clinical Oncology Statement. *J. Clin. Oncol.* **33**(33), 3961–3967 (2015)