

Can habitual physical activity improve anthropometric and metabolic parameters in *BRCA 1/2* women?

Letizia Galasso¹, Lucia Castelli¹, Antonino Mulè¹, Eleonora Bruno², Patrizia Pasanisi², Eliana Roveda^{1,3}, Angela Montaruli^{1,3}

¹ Department of Biomedical Sciences for Health, University of Milan, Milan, Italy

² Department of Research, Fondazione IRCCS Istituto Nazionale dei Tumori di Milano, Milan, Italy

³ IRCCS Istituto Ortopedico Galeazzi, Milan, Italy

The *BRCA 1/2* mutations are the most known typologies of hereditary breast cancer (BC). Studies among women carrying these mutations have showed preliminary evidence of a protective role of physical activity (PA) against BC, particularly during adolescence or early adulthood. Previous data confirmed a significantly lower BC prevalence in women reporting higher PA in their adolescence [1, 2]. In addition, on healthy pre-menopausal women at high risk of BC, the practice of PA showed that it raised adiponectin and lowered leptin, controlling for a change in body fat and suggesting the importance of adipokines in *BRCA* penetrance [3]. Aim of the current study was to assess the role of PA on BC risk factors in women carrying *BRCA 1/2* mutations.

Data analysis involved 63 women (47.6±12.4 years) with *BRCA 1/2* mutations, in care at Fondazione IRCCS Istituto Nazionale dei Tumori, Milan. The participants filled in Godin-Shepard Leisure-Time Physical Activity Questionnaire for the evaluation of the PA levels. Moreover, they underwent to anthropometric, metabolic, and blood sample assessments. Data were analyzed with SPSS version 27.

The women were classified as *inactive* (n=41) and *active* (n=22). Insulin levels were found significantly lower in active compared to the inactive group ($p<.05$); in addition, there were no differences for the other variables analyzed.

The correlation analysis on the total sample showed that higher PA levels were significantly correlated with lower weight ($r_2=-0.26$, $p<.05$), BMI ($r_2=-0.30$, $p<.05$), hip circumference ($r_2=-0.30$, $p<.05$), fat mass both in % ($r_2=-0.31$, $p<.05$) and in kg ($r_2=-0.28$, $p<.05$), and triglycerides ($r_2=-0.28$, $p<.05$).

These findings suggest that higher levels of PA can play an important and protective role against BC. Therefore, structured PA interventions could be a tool for modulate the penetrance of hereditary BC.

References

- [1] Kiechle, M, et al., Feasibility of structured endurance training and Mediterranean diet in *BRCA1* and *BRCA2* mutation carriers-an interventional randomized controlled multicenter trial (LIBRE-1). *BMC Cancer*, 2017. 17, 752.
- [2] Grill, S, et al., Smoking and physical inactivity increase cancer prevalence in *BRCA-1* and *BRCA-2* mutation carriers: results from a retrospective observational analysis. *Arch Gynecol Obstet.*, 2017. 296(6):1135-1144.
- [3] Sturgeon, K, et al., Exercise-Induced Dose-Response Alterations in Adiponectin and Leptin Levels Are Dependent on Body Fat Changes in Women at Risk for Breast Cancer. *Cancer Epidemiol Biomarkers Prev.*, 2016. 25:1195- 1200.

Key words

Hereditary breast cancer, physical activity, anthropometry, quality of life.