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Attenuation of brown adipose tissue activity during chemotherapy treatment: a new mechanism of weight gain in breast cancer women?

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Background and Aims: Weight gain has been reported in 17 to 34% of early stage breast cancer patients during chemotherapy. This gain has become a major concern because it has been suggested that weight variation was associated to a poor prognosis. However the mechanisms involved remain unclear. Alteration in thermogenesis induced by a decrease of brown adipose tissue (BAT) activity after chemotherapy, may partly contribute to weight gain in these patients.

Methods: A PET/CT scan was performed at baseline and after one course of docetaxel + trastuzumab treatment in 26 breast cancer women. Variation of 18F-FDG uptake in BAT between the two measures was assessed retrospectively according to weight changes.

Results: Percentage of patients who gained weight was 35%, 25% lost weight and 40% remained stable. Women who gained weight during chemotherapy experienced a significant decrease of 18F-FDG uptake in BAT (p=0.0048).

Conclusion: These original data suggest for the first time that BAT modulation by chemotherapy would be a potential contributor to body weight gain through blunted thermogenesis in breast cancer patients.