

## Extra body fat and breast cancer risk

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### Abstract

Obesity has been epidemic in the US for over two decades. Obesity has been linked to the risk of development of various cancers, including breast cancer both in pre and postmenopausal women. Previously, we have reported that obesity is risk factor for breast cancer development using DMBA-induced mammary tumor model. Dehydroepiandrosterone (DHEA) is an over-the-counter dietary supplement used as an anti-cancer agent and anti-obesity supplement. The objectives of this study were to investigate the long-term effects of obesity using obese Zucker rat as model and DHEA treatment on body weight gain, breast cancer development and also serum DHEA, DHEA-S, IGF-1 and IGFBP-3 using 7,12-dimethylbenz(a)anthracene (DMBA)-induced mammary tumor model. We used 43 six-week-old obese female Zucker rats and we randomly assigned them *ad libitum* to a diet either chow as a control diet or chow with the addition of DHEA at a concentration of 6 g/kg of chow as a DHEA diet. We induced mammary tumors by orally gavaging all of the rats at age 50 days with 65 mg DMBA/kg body weight and were sacrificed 155 days post-DMBA treatment. Fifty-five percent (55%) of the control diet group developed mammary tumors, while no tumors were detected in the DHEA diet group ( $P < 0.001$ ). Obese rats fed the DHEA diet gained significantly less weight ( $P < 0.001$ ) and had an increased ( $P < 0.001$ ) serum DHEA and DHEA-S compared to control rats. Also, obese DHEA-Fed rats had significantly ( $P < 0.001$ ) lower serum IGF-1 and IGF-BP3. Our results suggest that DHEA treatment can reduce body weight gain by lowering serum IGF-1 and IGFBP-3 which might protect against breast cancer development caused by obesity. Also, these results suggest that extra body fat can be a risk factor for breast cancer development and by losing the extra body fat, the risk of breast cancer development can be eliminated. Supported by ABI to RH.

### Biography

Reza Hakkak is working as a faculty member University of Arkansas for Medical Sciences, is a nutritionist, Professor and Chairman of the Department of Dietetics and Nutrition in the College of Health Related Professions, Professor of Pediatrics in the College of Medicine, and Professor of Maternal Child Health in the College of Public Health. His research is primarily in the areas of basic nutrition science research and nutrition education. His basic nutrition research interests include the influence of nutrition on cancer prevention, the influence of obesity on cancer promotion, and the effects of differing diets and nutrition on chemical carcinogenesis. For past 10 years, his research interests have focused on links between obesity, diet and breast cancer promotion.