Introduction: Several adverse effects of radiotherapy have been associated with the process of increased oxidative stress in the organism. In this context, vitamin A noteworthy for its important role in combating oxidative stress, in addition to its chemoprotective effect. Objective: To assess the serum levels of vitamin A (retinol and β-carotene) and their relationship to breast cancer staging in patients before and after radiotherapy. Methods: This is a prospective study of women with breast cancer who were evaluated from October 2011 to September 2012 before (T0) and after radiotherapy (T1-7 days). Serum retinol and β-carotene levels were analyzed using High Performance Liquid Chromatography. The assignment of breast cancer stages was based on the classification of malignant tumors that has been proposed by the International Union Against Cancer. Results: 230 patients (mean age 63.6 years, SD ± 9.38) were evaluated. There was a significant reduction in the serum retinol (45.1 ± 18.2 g/dL at T0 to 27.1 ± 11.7 g/dL at T1, p < 0.001) and β-carotene (209.0 ± 153.6 g/L at T0 to 47.7 ± 25.5 g/L at T1, p < 0.001). There was also a significant difference in serum retinol (p < 0.001) and β-carotene (p = 0.003) levels based on the disease stage. Conclusions: It is recommended the early establishment of adequation serum concentrations of retinol and beta-carotene, offering nutritional assistance for those patients with deficiencies, in order to minimize the harmful effects of radiation.

Keywords
Breast cancer, Radiotherapy, Antioxidants, Retinol, β-carotene.