

Impact of Ipsilateral Blood Draws, Injections, Blood Pressure Measurements, and Air Travel on the Risk of Lymphedema for Patients Treated for Breast Cancer

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Terms in [blue](#) are defined in the glossary, found at the end of this article and online at www.jco.org

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A B S T R A C T

Purpose

The goal of this study was to investigate the association between blood draws, injections, blood pressure readings, trauma, cellulitis in the at-risk arm, and air travel and increases in arm volume in a cohort of patients treated for breast cancer and screened for lymphedema.

Patients and Methods

Between 2005 and 2014, patients undergoing treatment of breast cancer at our institution were screened prospectively for lymphedema. Bilateral arm volume measurements were performed preoperatively and postoperatively using a Perometer. At each measurement, patients reported the number of blood draws, injections, blood pressure measurements, trauma to the at-risk arm(s), and number of flights taken since their last measurement. Arm volume was quantified using the relative volume change and weight-adjusted change formulas. Linear random effects models were used to assess the association between relative arm volume (as a continuous variable) and non-treatment risk factors, as well as clinical characteristics.

Results

In 3,041 measurements, there was no significant association between relative volume change or weight-adjusted change increase and undergoing one or more blood draws ($P = .62$), injections ($P = .77$), number of flights (one or two [$P = .77$] and three or more [$P = .91$] v none), or duration of flights (1 to 12 hours [$P = .43$] and 12 hours or more [$P = .54$] v none). By multivariate analysis, factors significantly associated with increases in arm volume included body mass index ≥ 25 ($P = .0236$), axillary lymph node dissection ($P < .001$), regional lymph node irradiation ($P = .0364$), and cellulitis ($P < .001$).

Conclusion

This study suggests that although cellulitis increases risk of lymphedema, ipsilateral blood draws, injections, blood pressure readings, and air travel may not be associated with arm volume increases. The results may help to educate clinicians and patients on posttreatment risk, prevention, and management of lymphedema.

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INTRODUCTION

Clinicians and national guidelines strongly advise patients with breast cancer to avoid blood draws, injections, blood pressure readings, and trauma to the at-risk arm during and after treatment to reduce the risk of developing cellulitis and breast cancer-related lymphedema (BCRL).¹⁻⁶ Patients are also advised to exercise caution when flying by wearing prophylactic compression sleeves.^{1,3,5} These guidelines are based on anecdotal information, and comprehensive data demonstrating

the efficacy of such precautionary behaviors do not exist, highlighted in a recent statement by the National Lymphedema Network.⁵ The guidelines place a large amount of burden on patients and clinicians, who go to great lengths to exercise precautionary behaviors and face high levels of anxiety when they accidentally do not abide by the guidelines. Therefore, we sought to investigate the association between blood draws, injections, blood pressure readings, trauma, and cellulitis in the at-risk arm and flying on increases in arm volume in a large prospective cohort of patients undergoing treatment of breast cancer.