

## Prognostic Factors of Lymphoscintigraphic Findings in Patients with Breast Cancer-Related Lymphedema

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### OBJECTIVE

Lymphedema is a chronic disabling disease that can occur in breast cancer patients after the treatment. Early diagnosis and treatment would be important for lymphedema. Lymphoscintigraphy (LSG), which using mainly qualitative factor analysis, is a useful tool for lymphedema diagnosis and severity assessment. Not only its usage for diagnosis of lymphedema, we purposed to evaluate its role as prediction of effects of complete decongestive therapy (CDT) in lymphedema after breast cancer treatment. ,

### METHODS

Of the patients who visited our clinic from January 2017 to April 2018, patients diagnosed as clinical lymphedema after breast cancer surgery (sentinel node biopsy or axillary lymphnode dissection) were screened. Among them, patients who underwent LSG within 3 months before and after 2 weeks of initial CDT were included. Arm circumference was measured at 4cm intervals from hand dorsum before and after treatment with CDT and summated as whole arm volume. Percentage excess volume (PEV) and percentage reduction in excess volume (PREV) were calculated. Using LSG, we calculated ratio of the affected to unaffected side of upper extremity uptake and axillary node uptake at 1 hour and 2 hour after the injection of Tc-99m Phytate in 2nd interdigital space. Those who has uptake in supraclavicular lymph node were analyzed including this area additionally.

### RESULTS

A total of 18 patients who met the inclusion criteria were included and average age of them was  $55.3 \pm 9.2$  years old. Average time from surgery to CDT were and  $25.6 \pm 46.4$  months. Initial PEV showed positive correlation with ratio of upper extremity uptake at 2 hour and negative correlation with ratio of axillary node uptake and axillary plus supraclavicular nodes uptake (Fig 1.). PREV showed positive correlation with ratio of axillary node uptake at 2 hours after injection (Fig 2.). When we divided the patients into 4 groups according to lymph node uptake in axillary and/or supraclavicular area, PREV was highest in the group having only the axillary lymph node uptake without any statistically significant difference between the groups (Fig 3.).

### CONCLUSION

Quantitative and qualitative analysis of LSG are useful for predicting the prognosis after CDT as well as assessment of severity of lymphedema in breast cancer patients.

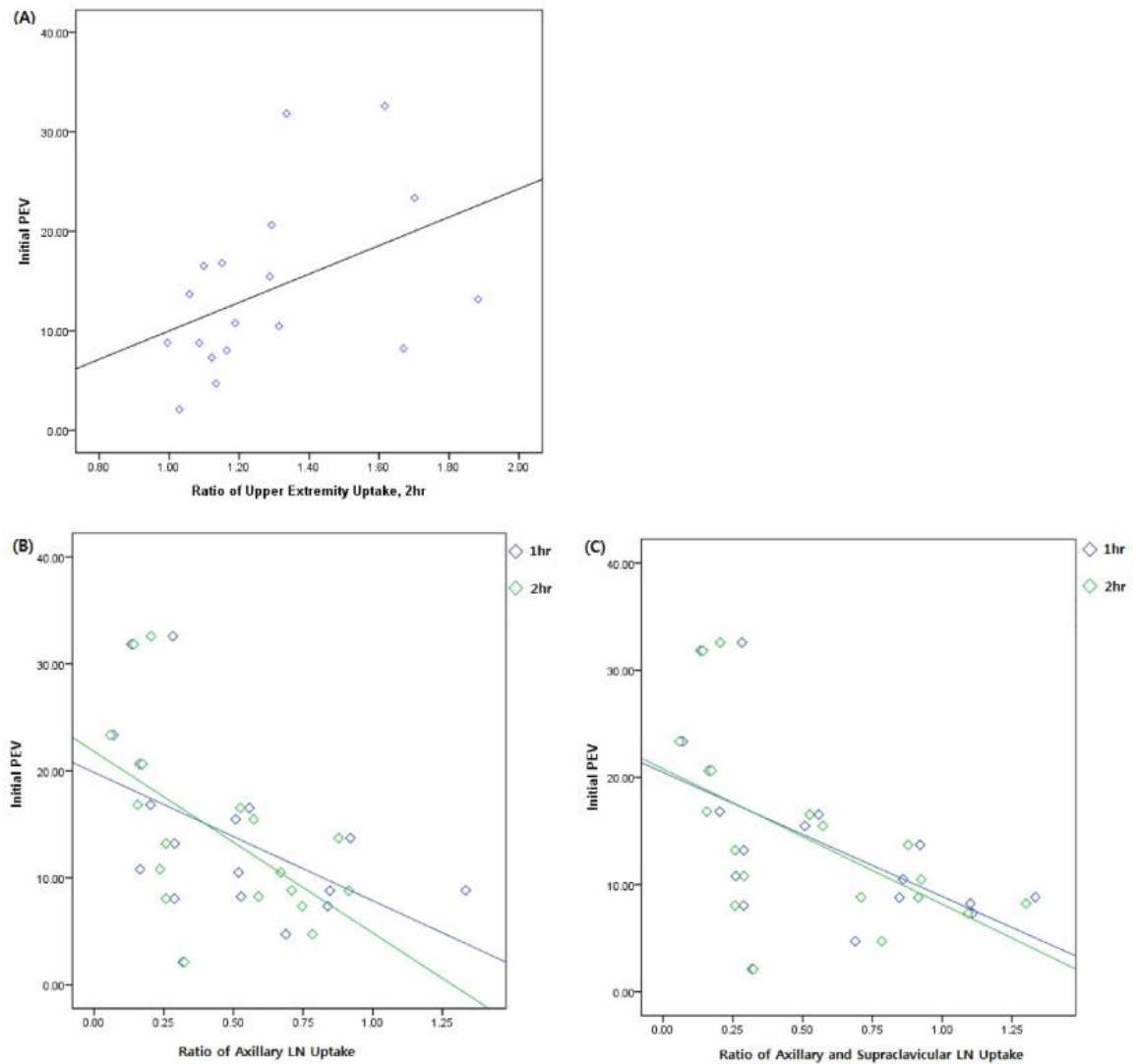


Fig 1. Quantitative factors of LSG and initial PEV (Percentage excess volume). Analysis was done by Kendall tau rank correlation. (A) The ratio of upper extremity uptake at 2 hour and the initial PEV showed positive correlation ( $\tau\text{-}b=0.359$ ,  $p\text{-}value=0.037$ ). (B) The ratio of axillary LN uptake at 1, 2 hour were inversely correlated with initial PEV ( $\tau\text{-}b=-0.386$ ,  $p\text{-}value=0.025$  at 1 hour,  $\tau\text{-}b=-0.477$ ,  $p\text{-}value=0.006$  at 2 hour). (C) The ratio of axillary and supraclavicular LN uptake at 1-, 2- hour were inversely correlated with initial PEV showing more statistically significant correlation than axillary LN uptake ( $\tau\text{-}b=-0.438$ ,  $p\text{-}value=0.011$  at 1 hour,  $\tau\text{-}b=-0.490$ ,  $p\text{-}value=0.004$  at 2 hour).

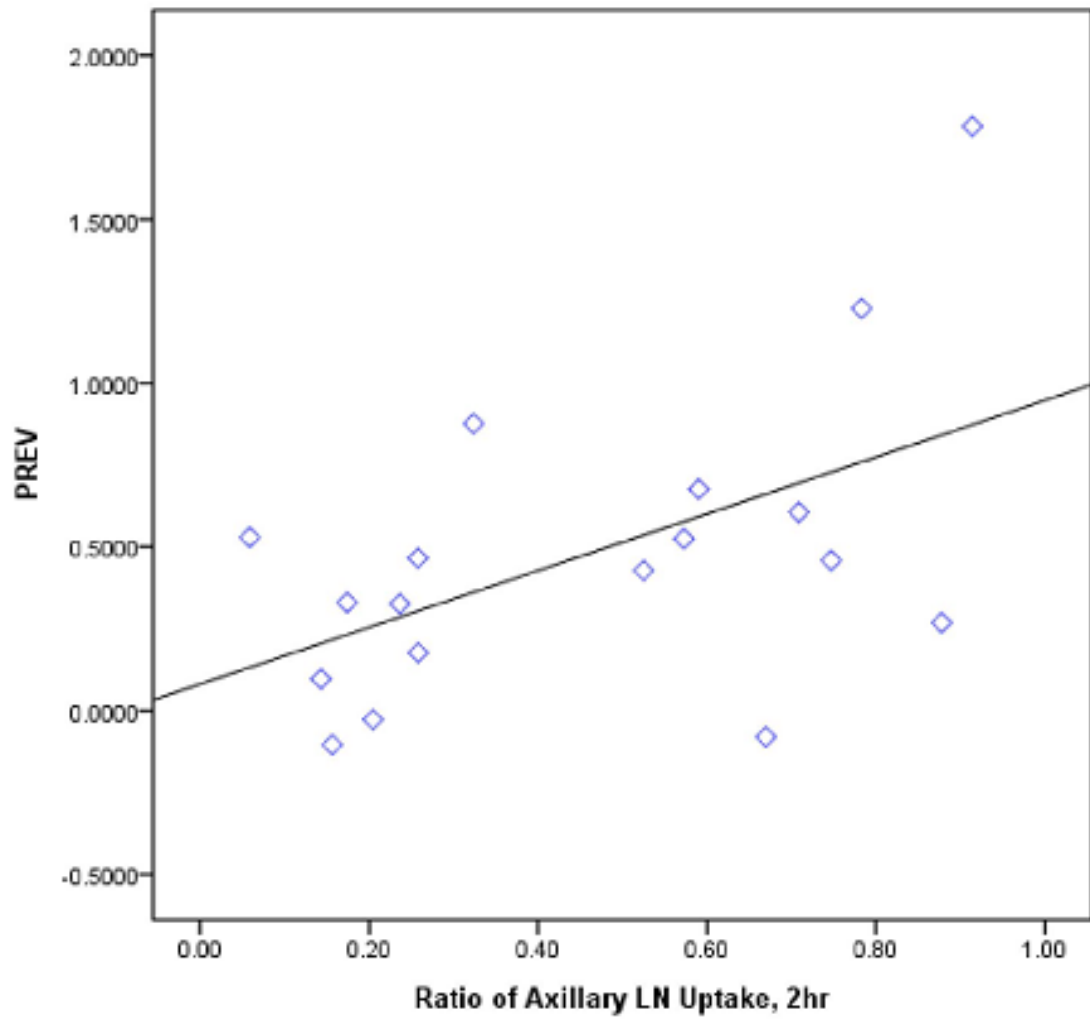


Fig 2. Quantitative factors of LSG and initial PREV (Percentage reduction in excess volume). Analysis was done by Kendall tau rank correlation. PREV showed positive correlation with the ratio of axillary node uptake at 2 hours after injection. ( $\tau\text{-}b=0.346$ ,  $p\text{-}value=0.045$ ).

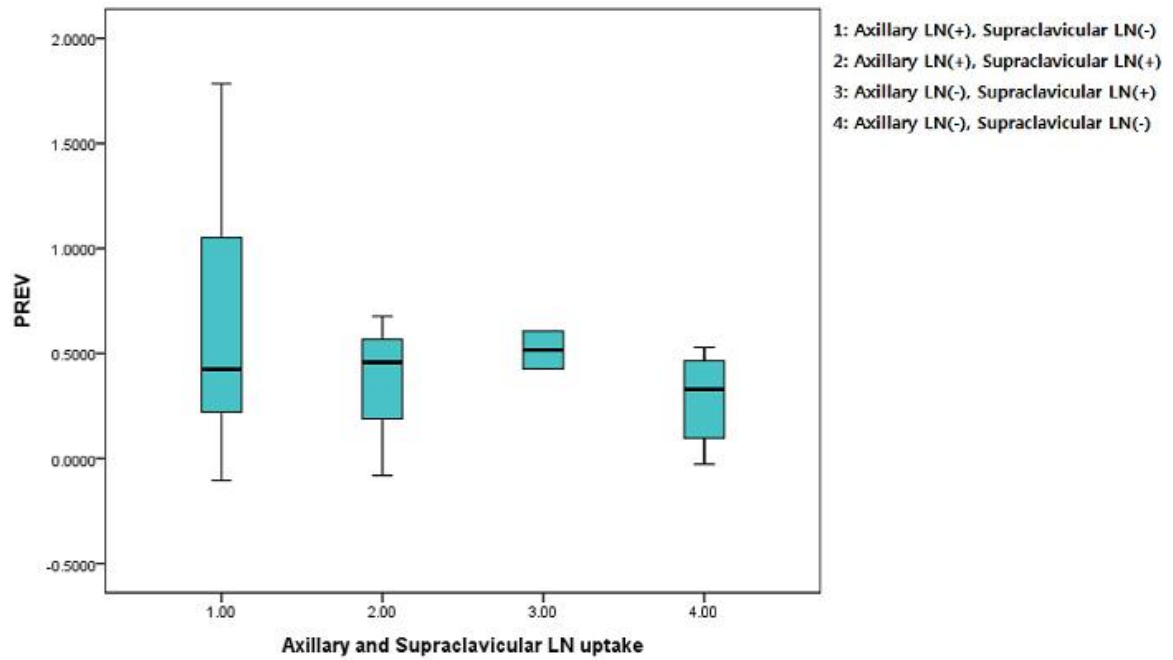


Fig 3. PREV differences according to regional LN uptake. Average of PREV was highest in group 1 and lowest in group 4, though these differences between groups were not statistically significant. Mean±SD of each group was estimated as follows; Group 1:  $0.63 \pm 0.22$ , Group 2:  $0.35 \pm 0.22$ , Group 3:  $0.51 \pm 0.89$ , Group 4:  $0.27 \pm 0.11$ . The line in the box indicates the median value of each group.