



***Body mass index as risk factor for lymphedema one year after surgery for endometrial cancer. A prospective longitudinal multicentre study.***

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The authors have no conflict of interest to declare



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# Background

- There is a lack of 'gold standard' for measuring lymphedema \*
- The incidence of lymphedema vary substantially depending of method of measuring.
- Consequently, risk factors are not uniform and cannot be regarded as valid\*

## Aim of the study

To determine the impact of BMI on risk factors for lymphedema assessed as crude volume increase  $\geq 10\%$  (LLL CV) or as BMI-standardised volume increase  $\geq 10\%$  (LLL BMI-SV), one year after surgery for early-stage endometrial cancer (EC).



\* [Lindqvist E, Wedin M, Fredrikson M, Kjølhede P. Eur J Obstet Gynecol Reprod Biol. 2017;211:112-121.](#)



## Material and Method

An observational prospective multicentre study conducted in 14 centres in Sweden.

-114 women with high-risk early-stage EC underwent surgery including pelvic and para-aortic lymphadenectomy

-117 women with low-risk early-stage EC had surgery without lymphadenectomy

Standardized measurements of circumference of the legs enabling calculation of leg volume. (Sitzia)\*

Preoperatively (baseline)

1 year postoperatively

Lymphedema = volume increase  $\geq$  10%: (1 year – baseline)

Crude volume (CV) and BMI-standardized volume (BMI-SV)

$$\text{BMI-standardized volume} = \frac{\text{estimated leg volume} * \text{mean BMI}}{\text{de facto BMI}}$$

\*Sitzia J. Eur J Cancer Care(Engl). 1995;4(1):11-6

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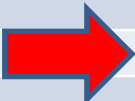
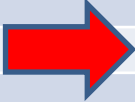
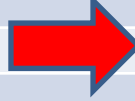
# Results

Incidence of lymphedema (LLL) according to CV: 12% (28/231), and according to BMI-SV: 9.5% (22/231).  
Interrater agreement: 0.91 (95% CI 0.87 - 0.95); Cohen's kappa: 0.55 (95% CI 0.42 – 0.68)

Risk factors	LLL CV* (aOR (95%CI))	LLL BMI-SV* (aOR (95%CI))
Age		1.07 (1.00–1.15)
BMI	0.87 (0.79-0.97)	
Δ BMI (kg/m <sup>2</sup> ), mean (SD) §	1.91 (1.34-2.71)	
Diuretics	3.27 (1.20-8.92)	
Diabetes Mellitus		5.44 (1.67–17.66)
Lymphadenectomy (LA)		14.42 (3.49–59.62)
Number of lymph nodes removed		1.03 (1.01-1.05)
Location of LA		1.00 (reference )
No LA		
Pelvis only		21.84 (3.93– 21.39)
Pelvis + para aortic		12.07 (2.92–49.87)
Extent of LA		1.00 (reference )
No LA		
Below AB		22.56 (4.04–125.90)
Between AB and IMA		25.12 (3.54–178.15)
Between IMA and LRV		10.70 (2.52–45.40)
Proximal to the DCIV		14.26 (3.41–59.69)
Distal to the DCIV		15.89 (1.80–139.99)
Adjuvant oncological treatment		1.00 (reference)
None		
Radiation		15.02 (2.34-96.57)
Chemotherapy		0.50 (0.15-1.69)
Chemotherapy + radiation		0.51 (0.09-2.74)

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## ***Conclusions.***

BMI is a strong risk factor for LLL that outweighs the effect of obvious risk factors and therefore should be adjusted for when assessing lymphedema.

Adjuvant radiation therapy and LA were independent risk factors for LLL together with age and diabetes mellitus.

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