Impact of number of positive lymph nodes and lymph node ratio on overall survival and disease-free survival of women with node-positive breast cancer

Fabiana Tonellotto (me); Anke Bergmann (coorientator); Luiz Claudio Santos Thuler (advisor)

Instituto Nacional de Câncer José Alencar Gomes da Silva

PURPOSE

This study aimed to evaluate the association of axillary lymph node ratio (LNR) and number of positive lymph nodes (pN) with the risk of breast cancer recurrence and death.

METHODS

This is a retrospective cohort study of node-positive breast cancer patients (ICD-10, C50) diagnosed and treated between 2008 and 2009 at Cancer Hospital III, a reference center of the Brazilian National Cancer Institute (INCA), Brazil. The study was approved by the INCA Research Ethics Committee in accordance with resolution CNS n. 466/12 under protocol number 128/11. Patients 18 years of age and older presenting with clinical stage II and III breast cancer were included. As per institutional routine, all patients underwent mastectomy or segmental resection + ALND (Berg levels I, II or I, II and III) with or without previous axillary lymph node biopsy. A retrospective cohort study of node-positive stage II e III breast cancer patients diagnosed and treated between 2008 and 2009 at the Brazilian National Cancer Institute (INCA), Brazil.

RESULTS

In total, 628 women with node-positive breast cancer were included. Most patients (69.5%) had advanced clinical stage tumors (≥ IIB). The median follow-up was 58 months (range: 3 92 months). All women underwent surgery for invasive breast cancer with axillary lymph node involvement and no distant disease. The median age was 54 years (range: 23 91 years), most women were Caucasian (55%), single (54%), and had completed eight or more years of education (57%) .

Most patients had advanced clinical stage tumors (≥ IIB); the predominant histological subtype was high-grade (48%) invasive carcinoma of no special type (87%). Estrogen and progesterone receptors were positive in 76% and 66% of cases, respectively, and HER2 overexpression was observed in 24% of patients.

The median number of lymph nodes removed per patient was 19 (range: 6 77). Nearly all women (98%) had 10 or more lymph nodes removed, and the median number of positive lymph nodes was four (range: 1 77). Based on the AJCC/UICC staging system, 304 patients were classified as pN1 (48%), 186 (30%) as pN2, and 138 (22%) as pN3 according to the number of positive lymph nodes.

Fifty-one percent of patients had lymph node ratio (LNR) < 0.20 (low-risk), 33% had LNR of 0.21 0.65 (intermediate-risk), and 16% of patients had LNR > 0.65 (high-risk). Extracapsular invasion and/or perinodal fat infiltration were observed in 35% of patients. Mastectomy was the treatment of choice in 91% of cases. Eighty-three percent of patients were administered chemotherapy, 57.5% of patients received neoadjuvant or adjuvant radiotherapy, 66.4% received hormone therapy, and 17% of patients were treated with trastuzumab. The median follow-up was 58 months (range: 3 92 months).

Table 1. Clinicopathologic characteristics of patients with node-positive breast cancer (n=628)

Variables	N	%
Age at diagnosis ≥ 50 **years**	408	65.0
Median (min-max)	54 (23-91)	
Schooling ≥ 8 years	360	57.3
Race/ethnicity White	348	55.4
Marital Status Living without a partner	337	53.7
Clinical Staging		
I	42	6.7
IIA	150	23.9
IIB	148	23.6
IIIA	86	13.7
IIIB	192	30.6
IIIC	10	1.6
Histological type		
Non special type invasive carcinoma	549	87.4
Lobular infiltrating carcinoma	36	5.7
Other	43	6.8
Histological grade		
Grade 1	38	6.1
Grade 2	193	30.7
Grade 3	300	47.8
Estrogen receptor Positive	480	76.4
Progesterone receptor Positive	413	65.8
HER-2 Positive	148	23.6
Surgery Mastectomy	572	91.1
Trastuzumabe Neo and/or adjuvant	106	16.9
Chemotherapy Neo and/or adjuvant	524	83.4
Radiotherapy Neo or adjuvant	361	57.5
Hormone therapy Neo and/or adjuvant	417	66.4
Tumor infiltration fat/perinodal extravasation	222	35.4
Number of lymph nodes removed =10	616	98.1
Median (min-max)	19 (6 a 77)	
Number of positive lymph nodes		
Median (min-max)	4 (1 a 49)	
PN1 (1-3)	304	48.4
pN2 (4-9)	186	29.6
pN3 (≥10)	138	22.0
Lymph node ratio		
Median (min-max)	0.20 (0.02-1.00)	
Low risk (≤ 0,20)	318	50.6
Intermediate risk (0,20 - 0,65)	208	33.1
High risk (> 0,65)	102	16.2

Missing values: Schooling (5; 0.8%); Marital Status (1; 0.2%); Histological grade (97; 1.4%)

PERSPECTIVES

Overall and disease-free survival curves for number of positive lymph nodes (pN) and lymph node ratio (LNR) risk groups will be constructed using the Kaplan-Meier method and compared by the log-rank test. Multivariate analysis will be performed using stepwise forward Cox regression models.

Projeto Gráfico: Setor de Edição e Informação Técnico-Científica / INCA