

ASSOCIATION OF BASELINE NEUTROPHIL-LYMPHOCYTE AND PLATELET-LYMPHOCYTE RATIOS WITH DISEASE PROGRESSION IN HIGH-RISK BREAST CANCER PATIENTS

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BACKGROUND



Incidence rates of breast cancer have continuously increased worldwide with higher proportion of mortality rates in developing countries. More than a third of breast cancer will develop distant metastases as the most attributable causes of mortality in malignancy. An economical but effective marker to estimate risk of disease progression might be very valuable in developing countries to improve surveillance.

OBJECT



A retrospective cohort study was performed in 1083 non-metastatic breast cancer patients to analyze the association of neutrophil to lymphocyte ratio (NLR) and platelet to lymphocyte ratio (PLR) with risk of breast cancer disease progression.

RESULT



Around three quarter of patients were diagnosed in stage III with median tumor size was 8 cm. Cut-off values were determined using Youden index resulting in threshold of 2.8 and 170 for NLR and PLR, respectively. At baseline analysis, higher NLRs were associated with skin and chest wall infiltration ($p = 0.0001$). Higher PLRs were associated with advanced stages ($p = 0.03$). After median follow up of 4.8 years, higher NLRs were associated with higher risks of disease progression (OR = 1.555; 95% CI: 1.206-2.005), shorter PFS (mean were 34.9 vs 53.5 months, $P=0.001$) and shorter time to develop distant metastases (66.6 vs 104.6 months, $P=0.027$).

CONCLUSION



High NLR values are associated with risks of breast cancer progression, shorter PFS, and shorter time to distant metastasis. Further larger or multicenter study is required to extend our understanding of NLR as potential marker for risk of breast cancer progression.

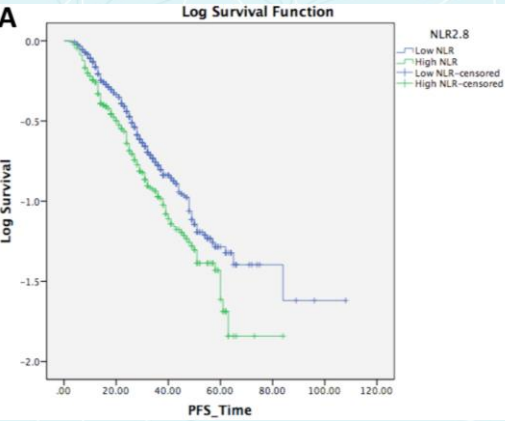
Table 1. Baseline characteristic data of breast cancer patients

variables	category	N (%)	variables	category	N (%)
Age	Mean (SD)	50.92 (10.54)	Histology grade	I	5 (0.5%)
	<35	76 (7.0%)		II	209 (19.3%)
	36-40	111 (10.2%)		III	869 (80.2%)
	41-55	530 (48.9%)	Stage	I	12 (1.2%)
	56-65	283 (26.1%)		II	355 (32.8%)
Ethnicity	>65	83 (7.7%)		III	716 (66.0%)
	Javanese	1060 (98.0%)	Tumor size	≤2 cm	46 (4.2%)
Residence	Non-Javanese	23 (2.0%)		2-5 cm	313 (28.9%)
	Rural	770 (72%)		>5 cm	724 (66.8%)
Menarche (years)	Urban	313 (28%)	Nodal metastasis	N0	301 (27.8%)
	≤12	190 (17.5%)		N1	548 (50.6%)
Menopause (years)	13-14	515 (47.6%)		N2	192 (17.7%)
	≥15	378 (34.9%)		N3	42 (3.9%)
	≤50	593 (76.2%)	ER	Negative	477 (44%)
Parity	>50	185 (23.8%)		Positive	606 (56%)
	Nulliparous	118 (11%)	PR	Negative	618 (57%)
Breastfeeding	Multiparous	965 (89%)		Positive	465 (43%)
	No	220 (21.0%)	HER2	Negative	789 (72.8%)
BMI	Yes	865 (79.0%)		Positive	294 (27.2%)
	≤18.5	136 (12.6%)	Subtype	Luminal-A	497 (45.9%)
Family history	18.6-25	536 (49.5%)		Luminal-B	124 (11.5%)
	25.1-30	303 (27.9%)		Her2-enriched	173 (16.0%)
	>30	108 (10.0%)	TBNC		
Family history	Yes	199 (18.0%)			
	No	884 (82.0%)			

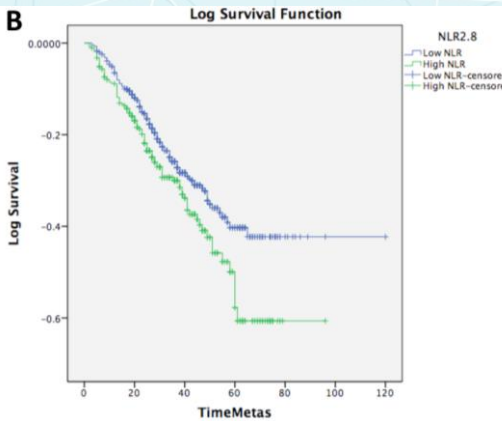
Table 2. Multivariate logistic regression analysis of disease progression risk

Variables	Category	Reference	Disease Progression (OR, 95%CI)
Ethnicity	Javanese	Non Javanese	1.208 (0.483–3.018), $P = 0.686$
	Rural	Urban	1.580 (1.158–2.115), $P = 0.004$
Menarche	≤12 years	>12 years	1.022 (0.725–1.441), $P = 0.900$
Menopause	>50 years	≤50 years	0.910 (0.635–1.303), $P = 0.606$
Parity	Multiparity	Nulliparity	0.958 (0.545–1.684), $P = 0.881$
Breastfeeding practice	Yes	No	1.127 (0.730–1.739), $P = 0.589$
BMI	>25	≤25	0.814 (0.622–1.066), $P = 0.136$
Family history	Yes	No	1.213 (0.864–1.703), $P = 0.263$
Stage	III	I-II (Early)	2.342 (1.599–3.430), $P = 0.0001$
	(Advance)		
Tumor size	>5 cm	≤5 cm	0.889 (0.652–1.213), $P = 0.459$
Axillary node	Positive	Negative	1.698 (1.185–2.433), $P = 0.004$
Estrogen receptor	Positive	Negative	0.968 (0.661–1.419), $P = 0.869$
Progesterone receptor	Positive	Negative	0.610 (0.420–0.885), $P = 0.009$
HER2 expression	Positive	Negative	0.751 (0.557–1.013), $P = 0.060$
Age	≤40 years	>40 years	1.789 (1.081–2.958), $P = 0.024$
NLR	>2.8	≤2.8	1.966 (1.450–2.665), $P = 0.0001$
PLR	>170	≤170	0.784 (0.612–1.040), $P = 0.060$

Picture 1. Progression free survival of all breast cancer patients high NLR vs low NLR mean PFS 34.9 and 53.5 (months), $P=0.001$



Picture 2. Distant metastasis event of all breast cancer patients high NLR vs low NLR mean 66.6 vs 104.6 (months), $P=0.027$



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