The relationship between the tumour-stroma percentage, clinicopathological characteristics and outcome in patients with invasive ductal breast cancer

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Introduction

The percentage of tumour-stroma (TSP) has recently been reported to be a novel independent predictor of outcome in patients with a variety of common solid organ tumours. The aim of this study was to examine the relationship between TSP, clinicopathological characteristics and outcome in patients with invasive ductal breast cancer, in particular node-negative disease.

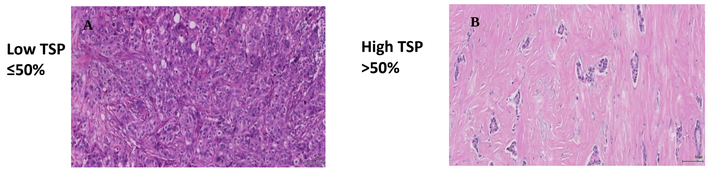

Figure 1. Tumor stroma percentage (TSP) on H&E sections.

Materials and Methods

A total of 361 patients with primary operable invasive ductal breast cancer were included in this study. 81 patients subsequently received chemotherapy.The TSP was assessed visually on the haematoxylin and eosin stained tissue sections. Local inflammatory response was assessed using the Klintrup-Mäkinen, With a cut-off value of 50% tumour to stroma percentage, patients with ≤50% stroma were classified as the low TSP group and those with >50% stroma were classified as the high TSP group (figure 1).

Results

120 (33%) patients had high TSP and in node-negative patients (n=207) 54 (26%) patients had high TSP. The relationship between TSP and clinicopathological variables is shown in table 1 & 2. The 15 year cancer specific survival was 79% v 21% in the TSP low group v TSP high group. Kaplan Meier survival curves show that high TSP was significantly associated with poorer cancer specific survival in the whole cohort (P<0.001), and in node negative patients (P=0.005) (figure 2).

In multivariate survival analysis, a high TSP was an independent prognostic factor for poorer cancer specific survival in the whole cohort (P=0.015) and in node- negative patients (P=0.014).

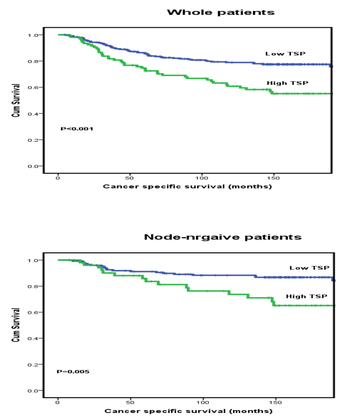

Figure 2.The relationship between tumor stroma percentage and cancer-specific in the whole cohort and in node-negative patients.

Table 2: The relationship between TSP and clinicopathological variables in node negative patients.

All patients (n=361).	TSP≤50 n=252 (70%)	TSP>50 n=109 (30%)	(*P*-value)
Age (≤50/ >50 years)	96/156	29/80	0.035
Tumour inflammatory infiltrate (low/high)	141/111	74/35	0.034
CD68+macrophage infiltrate (tertiles)	40/84/80	42/31/23	<0.001
CD4+T-lymphocyte infiltrate (tertiles)	66/111/75	36/54/19	0.023
CD8+T-lymphocyte infiltrate (tertiles)	71/80/101	73/46/26	0.017

Table 1: The relationship between TSP and clinicopathological variables in the whole cohort.

Node negative patients (n=207).	TSP(≤50) n=153 (74%)	TSP(>50) n=54 (26%)	(*P*-value)
Tumour inflammatory infiltrate (low/high)	89/64	39/15	0.068
CD68+macrophage infiltrate (tertiles)	27/49/46	24/13/10	0.001
CD4+T-lymphocyte infiltrate (tertiles)	36/67/50	17/28/9	0.040
CD8+T-lymphocyte infiltrate (tertiles)	41/52/60	22/20/12	0.016

Conclusion

A high tumour-stroma percentage is an independent predictor of poorer outcome in early breast cancer, in particular node-negative disease. Tumour-stroma as simple and reproducible parameter can be routinely incorporated into pathological examination and may have routine clinical utility in identifying patients at increased risk of cancer death.

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