Predictive and prognostic role of peripheral blood eosinophil count in triple negative and hormone receptor negative/HER2 positive breast cancers patients undergoing neoadjuvant treatment.

Onesti CE[1,2,3], Josse C[1,2,3], Poncin A[1,2,3], Frères P[1,2,3], Poulet C[1], Bours V[1,4], Jerusalem G[2,3]

1. *Laboratory of Human Genetics, GIGA Research Insitute, University of Liège, Liège, Belgium.*
2. *Department of Medical Oncology, University Hospital (CHU Liège), Liège, Belgium.*
3. *Laboratory of Medical Oncology, GIGA Research Insitute, University of Liège, Liège, Belgium.*
4. *Department of Human Genetics, University Hospital (CHU Liège), Liège, Belgium*

Introduction

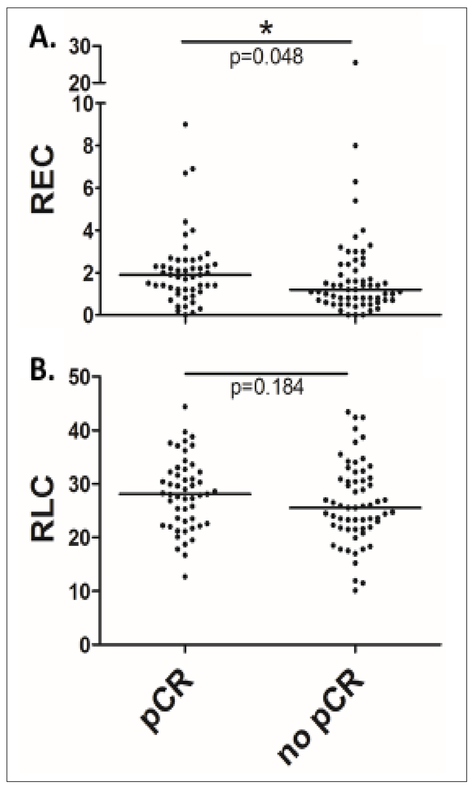
In clinical practice, up to 27% of breast cancer (BC) patients receive neoadjuvant chemotherapy (NAC). In this context, a pathological complete response (pCR) is the most commonly used end-point. High pCR rate is frequently associated with tumor infiltrating lymphocytes. Besides, circulating immune cells are also often linked to chemotherapy response.

Materials and methods

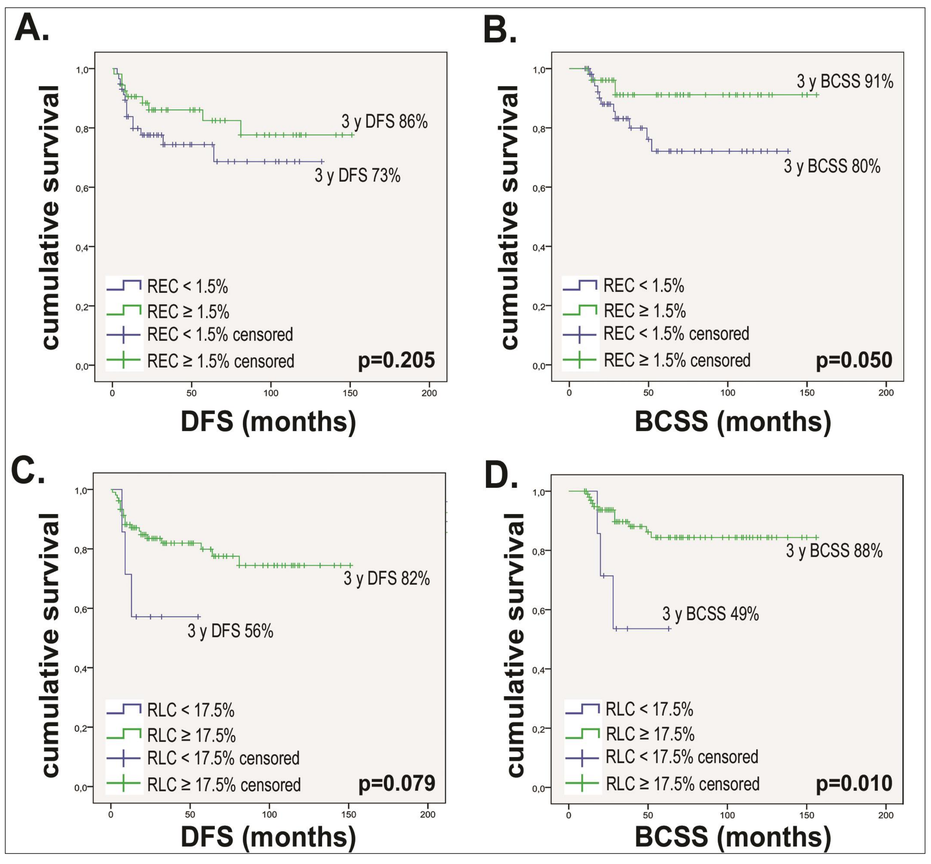
We performed a retrospective analysis on 112 BC patients (79 triple negative, 33 HR-/HER2+), treated with standard NAC. The median follow-up was 37.5 months (range 9-156). Eosinophil and lymphocyte count were collected at baseline, after surgery, at 1 year of follow-up and at relapse. The primary end-point is the association between the relative eosinophil count (REC) and pCR. The secondary end-points are the associations of REC, relative lymphocyte count (RLC) and eosinophil-lymphocyte product (ELP) with relapse, disease free (DFS) and breast cancer specific (BCSS) survival and to study the variation of REC and RLC during follow-up.

Results

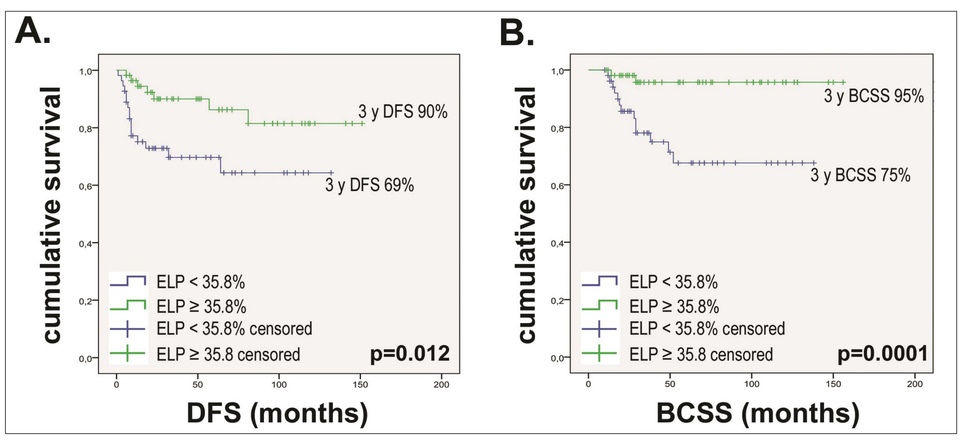
We observed a higher pCR rate in patients with REC≥1.5% vs patients with REC <1.5% (55.6% vs 36.2%, p = 0.04), and a higher median REC in patients with pCR (1.9% vs 1.2%, p 0.048). No statistically significant associations were detected between REC and relapse, nor between RLC with pCR or relapse. We observed a 3-year BCSS of 91% vs 80% for high and low REC respectively (p 0.05; HR 0.336, 95% CI 0.107-1.058) and of 88% vs 49% in RLC≥17.5% and <17.5% respectively (p 0.01; HR 0.217, 95% CI 0.060-0.783). No significant differences were detected for DFS. Combining the two parameters in the ELP, we observed an association with pCR (59.6% in ELP≥35.8 vs 30.9% in ELP<35.8, p 0.002), relapse (12.3% vs 29.1% in high and low ELP, p 0.028), DFS (3-year DFS 90% vs 69% in high and low ELP, p 0.012; HR 0.337, 95% CI 0.138-0.823) and BCSS (3-year BCSS 95% vs 75% in high and low ELP, p 0.001; HR 0.129, 95% CI 0.029-0.573). Moreover, we observed a raise of REC after surgery from 1.4% to 2.7% (p 0.0001) and a significant reduction at relapse from 2.8% to 1.7% (p 0.021). Conversely, a reduction of RLC from 26.75% at baseline to 20.15% after surgery (p 0.0001), without significant variation at relapse, was detected.



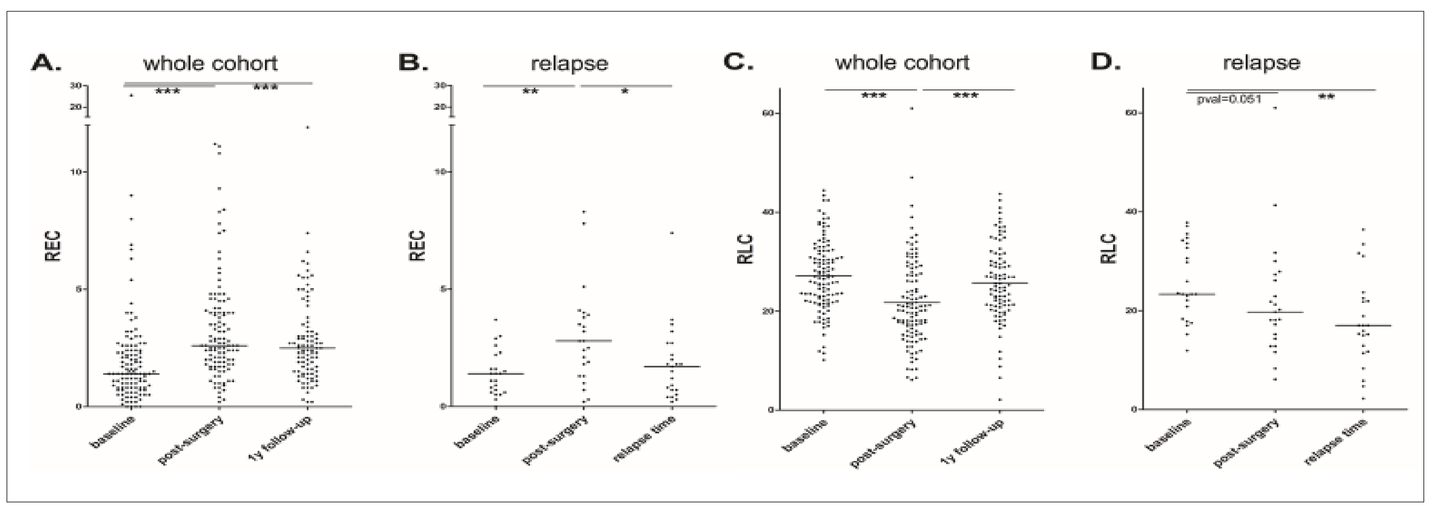
Scatter dot plots for baseline REC and RLC in patients showing or not a pCR.
A. Median baseline REC: 1.9% in patients experiencing a pCR vs 1.2% in patients without pCR (p=0.048). **B.** Median baseline RLC: 28.1% vs 26.9%, respectively (p=0.184).



Kaplan Meier curves for DFS and BCSS according to baseline REC and RLC



Kaplan Meier curves for DFS and BCSC according to ELP



Scatter dot plots for REC and RLC after surgery, after 1 year of follow-up and at relapse.
A. Baseline REC in the whole cohort: median value 1.4% at baseline vs 2.7% after surgery and 2.5% after 1 year of follow-up. **B.** Baseline REC in 23 patients experiencing a relapse: median value 1.4% at baseline vs 2.8% after surgery and 1.7% at relapse **C.** Baseline RLC in the whole cohort: 26.75% at baseline vs 20.15% after surgery and 24.90% after 1 year of follow-up. **D.** Baseline RLC in 23 patients experiencing a relapse: 23.3% at baseline vs 19.7% after surgery and 17% at relapse. The significant corresponding p values were reported in each panel. ***=pval≤0.0001; **=pval≤0.001.

Conclusion

REC, RLC and ELP could be new promising, affordable and accessible biomarkers predictive for NAC response and prognostic for longer survival in TNBC and HR-/HER2+ BC. Confirmation in a larger cohort is needed.

LIÈGE université
GIGA institute

CHU de Liège

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ceonesti@chuliege.be