341P- Impact of Environmental Temperature on Clinical Outcomes and Tumor Microenvironment of Early-Stage Breast Cancer

INTRODUCTION
- Preclinical evidence using 4T1 mouse model suggests that thermal (cold) stress increases tumor growth by modulating the tumor microenvironment (TME).
- However, the clinical relevance of temperature on breast cancer (BC) outcomes is unknown.
- Studies show that residing in cold regions is associated with higher incidence of BC.
- We aim to study the impact of environmental temperature on the pathological complete response (pCR) and survival of early-stage BC patients (pts).

RESULTS
- Out of the 1,304 early-stage BC pts, 271 pts received neoadjuvant chemotherapy (NAC) (186 from warm and 85 from cold environment).
- Higher clinical T- and N-stages were observed in pts from warm compared to cold regions (p<0.01).
- Pts residing in cold regions had more comorbidities (57.6% vs 4.8%, p<0.001).
- Pts in warm regions had higher pCR, though not statistically significant (8% vs 2.5%, p<0.1).
- The OS (univariate (UV) HR= 0.48, 95% CI 0.27-0.64, p <0.001; multivariate (MV) aHR= 0.56, 95% CI 0.32 - 0.96, p = 0.03) was higher in pts from warm compared to cold regions (Table 1).
- RFS (UV HR= 0.51, 95% CI 0.38 - 0.68, p<0.01; MV aHR= 0.52, 95% CI 0.36 - 0.75, p= 0.0005) were higher in pts from warm compared to cold regions (Table 1).
- The OS (aHR= 0.35, p= 0.02) and RFS (aHR= 0.49, p= 0.02) of pts who received NACT were also higher in warm regions (Figure 1 and 2).

Table 1: Clinical Outcomes of early-stage breast cancer patients from warm vs cold regions

<table>
<thead>
<tr>
<th>Regions (n)</th>
<th>5-yr OS (95% CI)</th>
<th>Median OS (months) (95% CI)</th>
<th>5-yr RFS (95% CI)</th>
<th>Median RFS (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold (782)</td>
<td>83 (76-86) %</td>
<td>157.7 (116.6 - NR)</td>
<td>69 (62-76) %</td>
<td>108.4 (88.9 - 147.8)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Warm (522)</td>
<td>95 (92-97) %</td>
<td>214.7 (205.3 - NR)</td>
<td>83 (79-87) %</td>
<td>250.4 (129.9 - 250.4)</td>
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CONCLUSION
- Early-stage BC pts living in cold have worse OS and RFS compared to warm regions.
- Larger studies are warranted to validate these interesting findings and further research focusing on therapeutic strategies to abrogate this outcome disparity by temperature is needed.

Authors declare no conflicts of interest
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