Abstract: **P3120**

**Prevention of heart failure in treatments with trastuzumab and anthracyclines: a meta-analysis**

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**Topic(s):**
Cardiotoxicity of Drugs and Other Therapies

**Citation:**

Background:
Trastuzumab and anthracyclines are conventional chemotherapies used in breast cancer. Unfortunately, they are associated with a decrease in left ventricular function potentially leading to heart failure (HF). In order to prevent this, randomised controlled trials (RCTs) assess the preventive effect of concomitant beta-blocker (BB), angiotensin receptor blocker (ARB) and angiotensin converting enzyme inhibitor (ACEI) therapy during chemotherapy.

Purpose:
To assess the preventive effect of BB, ARB or ACEIs on left ventricular ejection fraction (LVEF) during trastuzumab and anthracycline treatment in patients without HF.

Methods:
Our primary outcomes were the effect of BBs or ARB/ACEIs during 1) trastuzumab and 2) anthracycline treatment.

Secondary outcomes were the distinct effects of 1) BBs and 2) ARB/ACEIs in either trastuzumab or anthracycline treatments.

Through the search term "(RCTs), prevention, cancer chemotherapy and cardiotoxicity" in PubMed, studies were selected, excluding those without randomising to a BB, ARB/ACEI and a placebo control group during chemotherapy.

Means of the LVEF and the standard deviation (SD) post-chemotherapy were applied.

Meta-analyses estimated the standardised mean difference (SMD) in the LVEF.

Heterogeneity was calculated as the I².

Results:
A total of 7 studies (Table 1) were included in the analysis. Between 93 and 100% were woman. Age varied from 41 to 51 years. Treatment time varied from 12 to 52 weeks.

Concomitant BB or ARB/ACEI therapy during trastuzumab treatment was not associated with the LVEF, significantly (Fig. 1A; p=0.07). Oppositely, in the anthracycline regime the LVEF remained significant higher in the concomitant BB and ARB/ACEI groups as compared to controls (Fig. 1B).

BB and ARB/ACEI separation in the analysis showed both to influence the LVEF positively independent of chemotherapy (P=0.03 & p=0.005).

Conclusions:
Concomitant BB and ARB/ACEI therapy both favoured maintenance of the LVEF during trastuzumab and anthracyclines regimens as compared to controls.
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Study reference
Year Chemotherapies Preventive drugs
Gulati et al., “Prevention of Cardiac Dysfunction during Adjuvant Breast Cancer Therapy (PRADA).” 2016 Trastuzumab Candesartan, metoprolol
Boekhout et al., “Angiotensin II-Receptor Inhibition With Candesartan to Prevent Trastuzumab-Related Cardiotoxic Effects in Patients With Early Breast Cancer: A Randomized Clinical Trial.” 2016 Trastuzumab Candesartan
Janbabai et al., “Effect of Enalapril on Preventing Anthracycline-Induced Cardiomyopathy.” 2017 Anthracycline Enalapril
Nabati et al., “Cardioprotective Effects of Carvedilol in Inhibiting Doxorubicin-Induced Cardiotoxicity.” 2017 Anthracycline Carvedilol
Boekhout et al., “Angiotensin II-Inhibition With Candesartan to Prevent Trastuzumab-Related Cardiotoxic Effects in Patients With Early Breast Cancer: A Randomized Clinical Trial.” 2016 Anthracycline Carvedilol
Kaya et al., “Protective Effects of Nebivolol against Anthracycline-Induced Cardiomyopathy: A Randomized Control Study.” 2013 Anthracycline Nebivolol

Fig. 1

<table>
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<tr>
<th>Study</th>
<th>Trastuzumab</th>
<th>Anthracycline</th>
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<td>Jazdzewski et al. [1]</td>
<td>69.6 ± 4.7 (n=204)</td>
<td>69.6 ± 4.7 (n=204)</td>
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<td>Gou et al. [2]</td>
<td>69.6 ± 4.7 (n=204)</td>
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A: Trastuzumab
Randomised to ARB/ACEI[1] and BB[2]