A Review of Meta-Analyses on the Impact of Antibiotics on the Efficacy of Immune Checkpoint Inhibitors and Cancer Patients’ Survival

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BACKGROUND

- Prior research has strongly suggested that systemic antibiotic (ABX) exposure impacts the intestinal microbiota and may result in suboptimal immune checkpoint inhibitor (ICI) treatment outcomes.
- The magnitude of the observed effect seems to depend on cancer type and on the window of exposure to ABX relative to the initiation of the ICI treatment.
- Several independently-developed meta-analyses studying this phenomenon have been published in the past 24 months.

RESULTS

6 independently-developed meta-analyses (published in 2019 and 2020) studying the progression-free survival (PFS) and overall survival (OS) of cancer patients treated with ICIs (mainly anti-PD(L)1 antibodies as monotherapy or combined with other anticancer drugs) and exposed to ABX were identified and compared.

Table 1: Comparison of meta-analyses studying the impact of ABX exposure on the clinical outcomes of cancer patients treated with ICI

<table>
<thead>
<tr>
<th>1st Author</th>
<th>Publication Date</th>
<th>Journal</th>
<th>HRP S [95% CI] p-value N Studies</th>
<th>HR OS [95% CI] p-value N Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huang, 2019</td>
<td>Oncology Immunology</td>
<td>1.75 [1.49-2.02] p &lt; 0.001 N = 27</td>
<td>1.21 [1.09-1.72] p &lt; 0.01 N = 17</td>
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<td>Wilson, 2019</td>
<td>Cancer Immunology - Medicine</td>
<td>1.29 [1.05-1.59] p = 0.01 N = 35</td>
<td>1.64 [1.37-1.94] p &lt; 0.001 N = 37</td>
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<tr>
<td>Xu, 2020</td>
<td>Critical Reviews in Oncology/ Hematology</td>
<td>1.30 [1.34-1.71] p &lt; 0.001 N = 37</td>
<td>1.40 [1.16-1.71] p &lt; 0.001 N = 40</td>
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<tr>
<td>Petrelli, 2020</td>
<td>Journal of Clinical Medicine</td>
<td>1.33 [1.23-1.43] p &lt; 0.001 N = 18</td>
<td>1.41 [1.26-1.57] p &lt; 0.001 N = 22</td>
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<tr>
<td>Lurienne, 2020</td>
<td>Journal of Thoracic Oncology</td>
<td>1.39 [1.33-1.44] p &lt; 0.001 N = 37</td>
<td>1.51 [1.26-1.81] p &lt; 0.001 N = 43</td>
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<tr>
<td>Yang, 2020</td>
<td>International Immunopharmacology</td>
<td>1.52 [1.43-1.62] p &lt; 0.001 N = 31</td>
<td>1.49 [1.38-1.60] p &lt; 0.001 N = 37</td>
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METHODS

Medline (through PubMed), the Cochrane Library and major oncology conferences proceedings were systematically searched to identify abstracts, posters, articles, systematic reviews and meta-analyses studying the impact of ABX use on the clinical outcomes of cancer patients treated with ICIs. The meta-analyses were compared and the publications that were not included in any of the meta-analyses as of 25th of August 2020 were listed.

CONFLICT OF INTEREST

The study was sponsored by Da Volterra. JC, AC, RB and PB are employees of Da Volterra. JG, GZ are consultants for Da Volterra.

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REFERENCES