Dear editor,

With great interest we read the review of Alfieri et al. [1] concerning systemic therapies in metastatic salivary gland carcinomas. In addition to this, we hereby present our experience with novel HER2-targeted therapies in metastatic salivary duct carcinoma (SDC) patients.

SDC is a rare and aggressive subtype of salivary gland carcinomas, with a median overall survival (OS) of 3–4 years after primary diagnosis [2–4]. As stated in the above mentioned review, responses to chemotherapy are poor and knowledge about new drugs is based on small studies. Next to this, many studies “lumped” patients with a spectrum of salivary gland cancers, failing to fully appreciate the impact of the heterogeneity in salivary gland cancer [5].

In SDC, HER2 is overexpressed in 21–44% [4,6,7] of the cases, and could serve as a therapeutical target [8]. In Table 1 we show the available evidence on HER2-targeted therapies for metastatic SDC. The most important study is a phase II clinical trial in 45 patients treated with docetaxel and trastuzumab for advanced HER2-positive SDC, in which preliminary results show an overall response rate of 69% and a median progression free survival (PFS) of 11.3 months [9].

In breast cancer, patients receiving docetaxel and trastuzumab for HER2-positive metastatic breast cancer have a median PFS of 12.4 months and median OS of 40.8 months. Adding pertuzumab to this regimen extents the median PFS and OS to 18.7 and 56.5 months, respectively [10]. Because of similarities in histology and HER2 status, we hypothesized that adding pertuzumab may also increase PFS in SDC. In this letter to the editor we describe two patients treated with the combination of docetaxel, trastuzumab and pertuzumab in our clinic. Additionally, we demonstrate in one patient that after disease progression another line of HER2-targeted therapy with trastuzumab-emtansine can be beneficial.

*Corresponding author at: Geert Grooteplein Zuid 8, P.O. Box 9101, 6525 GA Nijmegen, The Netherlands.

E-mail addresses: wim.vanboxtel@radboudumc.nl (W. van Boxtel), eline.boon@radboudumc.nl (E. Boon), willem.weijis@radboudumc.nl (W.L.J. Weijis), frank-KNO.vandenhoogen@radboudumc.nl (F.J.A. van den Hoogen), uta.flucke@radboudumc.nl (U.E. Flucke), Carla.VanHerpen@radboudumc.nl (C.M.L. van Herpen).

http://dx.doi.org/10.1016/j.oraloncology.2017.06.023
1368-8375/© 2017 The Authors. Published by Elsevier Ltd.
This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
Both patients were treated with the combination of docetaxel, trastuzumab and pertuzumab. Docetaxel was dosed 75 mg/m² intravenously (IV) every 3 weeks. The HER2-targeting monoclonal antibodies trastuzumab and pertuzumab were dosed 600 mg subcutaneously and 420 mg IV every 3 weeks, respectively. For pertuzumab, patients received a loading dose of 840 mg in the first cycle. After 6 cycles docetaxel was stopped and trastuzumab and pertuzumab were continued until PD. After PD, one patient was treated with trastuzumab-emtansine. This is an antibody-drug conjugate consisting of trastuzumab linked to the microtubule inhibitor emtansine. It was dosed 3.6 mg/kg IV every 3 weeks.

Case 1. A 63-year-old man was diagnosed with a pT3N2bM0 androgen receptor (AR) positive SDC of the right parotid gland and primary treatment consisted of a parotidectomy with a modified neck dissection of level I–V, followed by adjuvant radiation therapy (66 Gy in fractions of 2 Gy). Only 8 months later, patient was diagnosed with metastases in liver, lungs and mediastinal lymph nodes for which palliative androgen deprivation therapy (ADT) was started. After 6 months, the patient had PD and ADT was stopped. Because HER2 was strongly positive (immunohistochemistry (IHC) 3+ and fluorescence in situ hybridization (FISH) positive), we started with the combination of docetaxel, trastuzumab and pertuzumab. After 2 cycles the patient had a partial response (PR). Currently, he has an ongoing PR 17 months after start of treatment, and received 25 cycles. Side effects consisted of a flare-up of radiotherapy toxicity induced by the systemic treatment and a pre-aurical and retropharyngeal abscess after 2 cycles.

Case 2. A 48-year-old woman was diagnosed with a pT3N1M0 SDC ex pleomorphic adenoma. Primary treatment consisted of a right parotidectomy with homolateral neck dissection, followed by adjuvant radiation therapy. Fifteen months after the initial diagnosis multiple pulmonary metastases were detected. Because of strong HER2 overexpression and amplification (IHC 3+ and FISH positive) and only weak AR expression, palliative treatment with the combination of docetaxel, trastuzumab and pertuzumab was initiated. The evaluation CT-scan showed SD with a decrease in the sum of target lesions by 22%. After the sixth cycle she developed erysipelas of the right side of her face. Eight months after start of treatment, progression of pulmonary metastases was detected. Trastuzumab and pertuzumab were stopped and ADT

---

**Table 1**

<table>
<thead>
<tr>
<th>Author</th>
<th>Study</th>
<th>Number of patients</th>
<th>Therapy</th>
<th>Clinical benefit</th>
<th>Median PFS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agulnik et al. [12]</td>
<td>Phase II trial</td>
<td>4</td>
<td>Lapatinib</td>
<td>No CR or PR</td>
<td>Unknown</td>
</tr>
<tr>
<td>Limaye et al. [13]</td>
<td>Case series</td>
<td>5</td>
<td>Trastuzumab, paclitaxel and carboplatin</td>
<td>1 × CR</td>
<td>18 months</td>
</tr>
<tr>
<td>2 × PR</td>
<td>2 × PD</td>
<td>Unknown</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perissinotti et al. [14]</td>
<td>Case series</td>
<td>11</td>
<td>3 patients: Trastuzumab only</td>
<td>3 × SD</td>
<td>Unknown</td>
</tr>
<tr>
<td>8 patients: Trastuzumab and chemotherapy</td>
<td>2 × PR</td>
<td>3 × SD</td>
<td>5 × PD</td>
<td>1 × non-evaluable</td>
<td></td>
</tr>
<tr>
<td>Falchook et al., [15]</td>
<td>Phase I trial</td>
<td>3</td>
<td>Trastuzumab, lapatinib and bevacizumab</td>
<td>1 × PR</td>
<td>3 months</td>
</tr>
<tr>
<td>De Block et al. [16]</td>
<td>Case series</td>
<td>3</td>
<td>Trastuzumab and chemotherapy</td>
<td>3 × PR</td>
<td>11 months</td>
</tr>
<tr>
<td>Takahashi et al. [9]</td>
<td>Phase II trial</td>
<td>45</td>
<td>Trastuzumab and docetaxel</td>
<td>31 × CR/PR → Response rate 69%</td>
<td>11.3 months</td>
</tr>
</tbody>
</table>


* Case-reports were excluded.

* Different combinations of chemotherapy were used.

---

**Fig. 1.** (a) Chest CT with a section width of 5 mm, pulmonary window, after intravenous contrast administration of the second patient before starting trastuzumab-emtansine. Pulmonary metastasis with cavitation in the left lower lobe of 29 mm in the largest axial direction and a more opacified metastasis in the right lower lobe measuring 34 mm in the largest axial direction. (b) Chest CT with a section width of 5 mm, pulmonary window, after intravenous contrast administration of the second patient after 4 months of treatment with trastuzumab-emtansine. Pulmonary metastasis in the left lower lobe measuring 16 mm. The pulmonary metastasis in the right lower lobe is immeasurable.
was started, but the first evaluation after 3 months showed an increase of the pulmonary lesions and a new brain metastasis. Therefore, ADT was stopped and she received stereotactic radiation therapy on the brain metastasis. The primary tumor was analyzed with the ‘Radbound Cancer Hotspot gene panel’, but no druggable mutations were found. Leaving HER2 as the only druggable target, we decided to start with trastuzumab-emtansine once every 3 weeks. After 6 cycles of trastuzumab-emtansine she had a PR with a decrease in the sum of target lesions of 70% (Fig. 1). Currently, after 12 cycles she has an ongoing PR.

Discussion

We presented two patients with metastatic SDC, which were treated with the combination of docetaxel, trastuzumab and pertuzumab. On this regimen, one patient has an ongoing PR after 17 months of treatment and one patient had PD after 8 months. In the last patient, we show that a subsequent line of HER2-targeted therapy can be beneficial, as this patient has a sustained PR after 8 months of treatment with trastuzumab-emtansine.

Remarkably, both patients developed erysipelas at the site of the resected primary tumor. Erysipelas is a known side effect of trastuzumab [11] but not for pertuzumab. Whether dual HER2 blockade increases the risk of this side effect, especially in a previously operated and irradiated area, is not known.

In conclusion, we showed that dual HER2 blockade and multiple lines of HER2-targeted therapies can be beneficial to patients with metastatic HER2-positive SDC. More research is needed to establish the advantage of the combination of docetaxel, trastuzumab and pertuzumab over docetaxel and trastuzumab alone. The efficacy of trastuzumab-emtansine in SDC has to be assessed, however we showed efficacy in one patient after PD with dual HER2 blockade.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest

None declared.

Acknowledgement

We would like to thank M. Brink, radiologist, for providing the radiology images.

References