

Letters to the editor

Response to 'The effect of PD-L1 testing on the cost-effectiveness of immune checkpoint inhibitors'

Dear Editor,

I am writing to highlight several inaccuracies in calculation of costs in a recent publication by Aguiar et al. [1] which assesses the effect of PD-L1 testing on the cost-effectiveness of immune checkpoint inhibitors in 21 NSCLC.

As of November 2016, the date authors refer to for obtaining atezolizumab costs, the correct wholesale acquisition cost (WAC) for atezolizumab was \$8620 for a 1200 mg vial. This translates to a price of \$7.183/mg for atezolizumab. Aguiar et al. assumed a price of \$10.42/mg, which is incorrect. The source for this cost is not stated in the manuscript.

While the date for obtaining atezolizumab costs was November 2016, the authors used February 2016 costs for the other two agents. As of November 2016, the WAC for nivolumab and pembrolizumab was \$25.07/mg and \$44.46/mg, respectively, which is higher than the assumption of \$24.69/mg and \$43.80/mg made in the Aguiar et al. manuscript.

The authors state that they conducted analyses from US Medicare perspective. The CMS payment limit for atezolizumab was unavailable in 2016 and hence the WAC (\$7.183/mg) could be used. The CMS payment limit in November 2016 was \$26.064/mg for nivolumab and \$46.495/mg for pembrolizumab; both higher than the assumptions in the manuscript.

Thus, the manuscript overestimates the cost of atezolizumab, while simultaneously underestimating the cost of the other two agents.

In November 2016, nivolumab and pembrolizumab had a flat dose as per the US package insert. Pembrolizumab had a flat dose of 200 mg Q3W and nivolumab 240 mg Q2W. Aguiar et al. do not state the dose assumptions for pembrolizumab and nivolumab. Based on Table 2, it appears that they assumed weight based dosing for these two drugs. At the assumed weight of 70 kg, the total dose for pembrolizumab (2 mg/kg) is 140 mg; much lower than the label flat dose of 200 mg. The assumed total dose for nivolumab (3 mg/kg) is only 210 mg, which is lower than the label

flat dose of 240 mg. Thus, the manuscript does not align with the US label and underestimates the cost of these drugs.

Table 1 shows cost calculations based on the US label dosing and the correct costs as of November 2016. For demonstrative purposes, the calculations use median cycles assumed in the manuscript by Aguiar et al., even though these do not align with the median exposure in the US label.

Using the corrected cost calculations, atezolizumab has the lowest cost, in contrast to the findings in the Aguiar et al. manuscript.

Using the July 2018 CMS payment limits (nivolumab: \$27.155/mg; pembrolizumab: \$48.514/mg; atezolizumab: \$7.6895/mg), total cost for atezolizumab (\$83 046) remains lower than nivolumab (\$97 758 for squamous NSCLC) and pembrolizumab (\$87 325).

Aguiar et al. should provide clarity on the sources for their assumptions, use comparable time frames for prices and doses of the different drugs, and make the necessary corrections to their calculations.

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Disclosure

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Reference

1. Aguiar PN, Perry LA, Penny-Dimri J et al. The effect of PD-L1 testing on the cost-effectiveness and economic impact of immune checkpoint inhibitors for the second-line treatment of NSCLC. *Ann Oncol* 2017; 28(9): 2256–2263.

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Table 1. Corrected drug price calculations for cancer immunotherapies

Drug	Flat dose (US label)	Drug price/mg	Source of price	Price/cycle	Median cycles (Aguiar et al. [1])	Total price
Nivolumab (squamous)	240 mg Q2W	\$26.064/mg	CMS limit (October 2016)	\$6088.8	15 cycles	\$93 830
Nivolumab (non-squamous)	240 mg Q2W	\$26.064/mg	CMS limit (October 2016)	\$6088.8	14 cycles	\$87 575
Pembrolizumab	200 mg Q3W	\$46.495/mg	CMS limit (October 2016)	\$9139	9 cycles	\$83 691
Atezolizumab	1200 mg Q3W	\$7.183/mg	WAC (November 2016)	\$8620	8 cycles	\$68 960