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Cost saving analysis of implementing subcutaneous formulation of atezolizumab in a Danish context (CS-ASSIST)

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OBJECTIVES

A subcutaneous (SC) administration of immunotherapy might offer a more time-efficient clinical setup. Capacity is a major focus area within Danish publicly funded healthcare. The objective was to analyze the potential cost and resource savings of using SC administration instead of an intravenous (IV) of atezolizumab in a Danish hospital outpatient setting.

METHODS

Two scenarios were constructed; one for IV and one for SC administration at a hospital outpatient setting. These two scenarios were compared based on total economic costs and time expenditure. In the analysis, all direct and indirect costs, from the pharmacy level to the patient leaving the hospital after treatment were estimated, quantified, and compared. The assumptions for time and cost associated with IV and SC administration were derived from atezolizumab's Summary of Product Characteristics [1], the Danish health technology assessment (HTA) institutes cost analysis [2], IMscin001 study [3, 4], and real-world data from the Danish Hospital Medicines Registry [5]. To align with local clinical practices relevant healthcare professionals (HCPs) validated the assumptions. These assumptions are based on treatment of PD-L1 ≥ 50% patients with non-small cell lung cancer (NSCLC).

Table 1: Clinically validate time and costs assumptions for atezolizumab IV and SC in NSCLC.

Resource	HCP	Atezolizumab SC	Atezolizumab IV
Preparation (min)	Pharmacy	0 [5]	0 [5]
Consultation (min)	Doctor	20 [2]	20 [2]
Preparation of patient and atezolizumab (min)	Nurse	5 [5]	30 [5]
Administration of atezolizumab - first administration (min)	Nurse	7 [1]	60 [1]
Administration of atezolizumab - subsequent administration (min)	Nurse	7 [1]	30 [1]
Observation time (min)	Nurse	0 [1]	0 [1]
Consultation following administration (min)	Nurse	15 [5]	0 [5]
Total (min)		**47**	**110 (140 as first administration)**

Figure 1: Distribution of administration cost of atezolizumab IV and SC
Administration cost calculated based on median Danish treatment length (8.2 months) and standardized HCP costs from the Danish HTA [2, 6, 7]
HCP- Health Care professional; HTA - health technology assessment; IV – intravenous; SC- Subcutaneous.

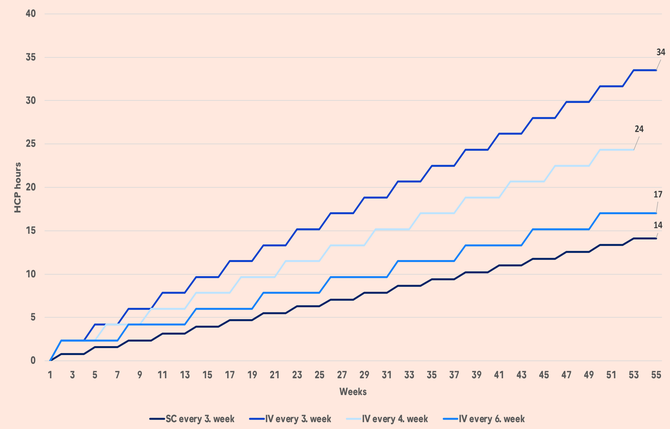

Figure 2: Accumulated HCP hours using EMA approved PD-(L)1 administration frequency [1,2].
HCP hours is defined as time used by HCPs (pharmacist, nurse and physician) in relation to the preparation, administration and follow-up in a Danish hospital out patient setting.
HCP- Health Care professional; IV – Intravenous; SC- Subcutaneous.

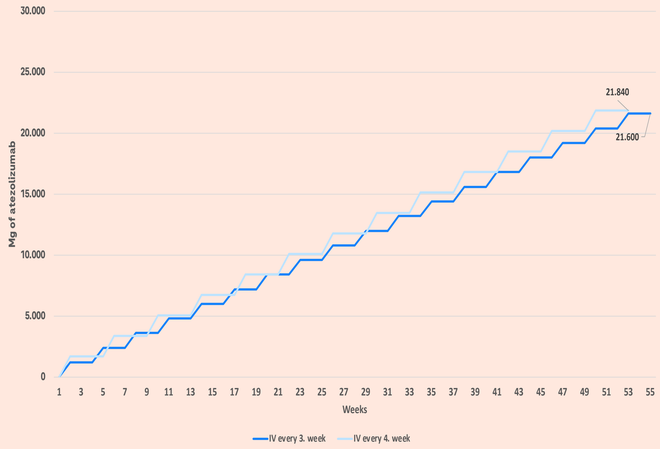

Figure 3: Dose of atezolizumab using IV at different administration frequencies
Based on the dose and administration frequency of atezolizumab SmPC: 1200 mg every 3 weeks or 1680 mg every 4 weeks [1] .
IV – Intravenous.

RESULTS

In a Danish hospital outpatient setting, a complete treatment course of atezolizumab per patient (excluding the cost of atezolizumab) administered IV requires 18.6 hours of HCP time and 933 euros, while SC administration requires 6.4 hours of HCP time and 620 euros based on a median Danish treatment length (8.2 months). Using a SC formulation instead of an IV can reduce HCP time by 65,6 % (12.2 hours) per patient and lower costs by 33,5 % (313 euros). Annually, 800 patients with PD-L1 ≥50% NSCLC in Denmark are eligible for mono-immuno-therapy. Implementing a SC formulation of atezolizumab could give a saving of 9,760 HCP hours and 250.400 euros compared with IV in this patient segment. When looking at the difference in the distribution of the administration-related costs both HCP costs and other costs were lower for the SC formulation (see Figure 1). In Figure 2, HCP time for atezolizumab SC was compared with the different administration frequency for the approved PD-(L)1 inhibit IV formulations (3, 4 and 6 weeks). We found that atezolizumab SC is the most HCP time efficient and 3 week IV formulations is the least time efficient. Over a complete year of treatment with either 3 or 4 weeks administration frequency patients will receive a comparable total dose of atezolizumab in mg (see Figure 3). If the price per mg is the same there are no drug related difference in 3 or 4 week administration frequency.

DISCUSSION

In Denmark PD-L1 ≥ 50% NSCLC patients treated with mono-immunotherapy primarily receive treatment in either 3 or 4 week administration frequency [6]. From a Danish RWE study of the survival benefit after implementation of first line immuno-therapy in advanced NSCLC the median progression free survival was 8.2 months (approx. 36 weeks) [7] and therefore, the expected saving of HCP hours would be between 8-14 hours (depending on whether 3 or 4 week administration is being used) using the SC formulation instead of IV. Some PD-(L)1 inhibitors could be administrated IV every six weeks. Under the assumption that the resource use of those PD-(L)1 is the same as for atezolizumab there is still cost and resource saving potential (see Figure 2). As these calculations are based on study data and HTA cost analysis, further validation in a real world setting is needed [1-3]. In addition to the time and cost savings associated with SC, recently published data from IMscin-002 study shows that patients prefer atezolizumab SC compared to IV [8]. No safety concerns was observed when shifting between atezolizumab IV and SC [8].

CONCLUSION

Implementing SC administration of atezolizumab in a Danish hospital outpatient setting has the potential to free up resources and increase capacity independent of current administration frequency of IV immunotherapy. This includes reducing the number of hours spent by HCPs (especially for nurses) and supports patient preferences, while simultaneously lowering economic costs.

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CONTACT AND CONFLICT OF INTEREST

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Conflict of interest: Beck C and Fanø A are employed by Roche Pharmaceuticals A/S.

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