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SYSTEMATIC LITERATURE REVIEW OF HOSPITAL TIME AND RESOURCE CONSUMPTION IN SUBCUTANEOUS AND INTRAVENOUS ONCOLOGIC BIOLOGIC THERAPIES: THE CASE STUDY OF ATEZOLIZUMAB FROM AN ITALIAN PERSPECTIVE

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Objective

- Atezolizumab (ATZ) is a monoclonal antibody targeting PD-L1 receptors and is used in cancer immunotherapy .
- The subcutaneous (SC) formulation offers a time-efficient alternative to the intravenous (IV) route, as reported in IMscin001 and IMscin002 studies (NCT03735121, NCT05171777) and highlighted in the systematic literature review (SLR) of McCloskey updated to April 2020 [1].
- The objectives of this study are (1) to compare time and resource consumption of SC and IV administration and (2) to estimate the saving associated to ATZ SC versus IV from the Italian hospital perspective.

Methods

- The SLR of McCloskey was updated up to December 2023 using the same inclusion criteria, official databases (Embase, PubMed, and EconLit) and search strategies.
- All peer-reviewed publications reporting on the active working time of healthcare professionals (HCPs) managing SC and IV administration of oncologic biological therapies were included.
- Outcomes (drug preparation time and time spent in the treatment room per patient by HCPs) were statistically combined using a random-effects model and summarized as mean and 95% confidence interval (CI).
- Potential savings of ATZ SC vs. IV formulation was estimated in terms of active time saved due to the reduction in both drug preparation and treatment room time.

Results

Systematic literature review update

- From the updated SLR, 7 new studies were added to those included in the previous analysis. A total of 22 papers were hence included in the present study (Figure 1).
- The estimated mean active time of pharmacists on drug preparation is 12.4 minutes (95% CI 9.5 to 15.3) for SC and 20.0 minutes (95% CI 14.7 to 25.3) for IV therapies.
- Nurses spend 14.0 minutes (95% CI 12.4 to 15.6) in the treatment room for SC and 30.6 minutes (95% CI 22.7 to 38.6) for IV.
- Overall HCPs active time is 26.4 minutes for any SC administration, distributed between pharmacist and nurse almost equally (Figure 2). For IV administration, the overall time is 50.6 minutes and the active work of nurse is greater than pharmacist. (Figure 2)

Figure 1. Flowchart of included studies in the analysis (PRISMA)

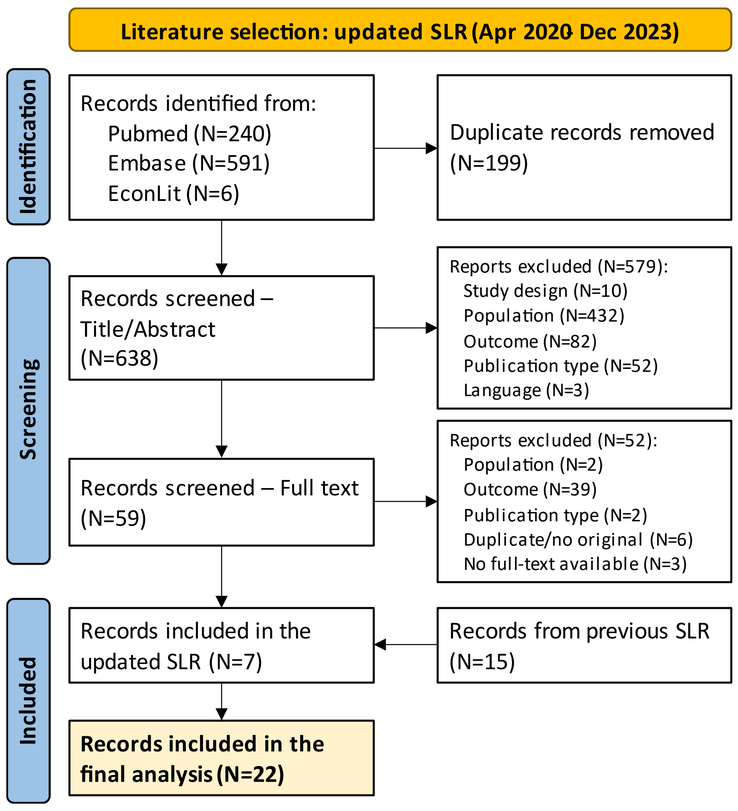
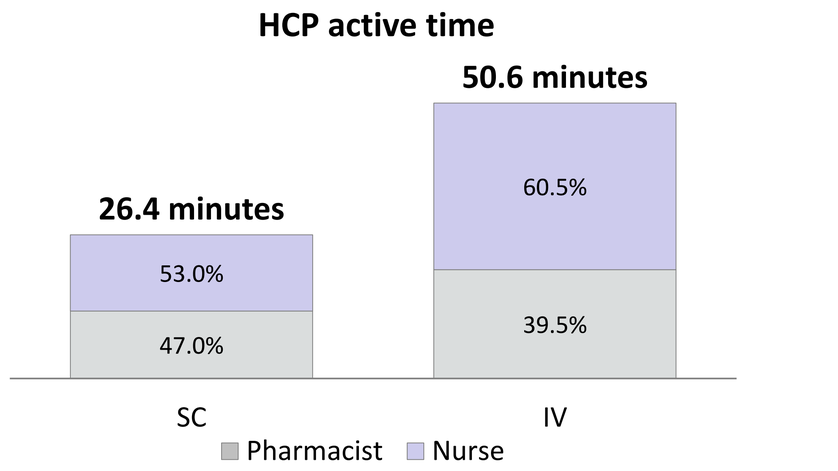


Table 1. Estimated HCPs time based on included studies in the SLR

Times (minutes)	Number of studies	Mean (95% CI)
Drug preparation time (SC)	5	12.4 (9.5 to 15.3)
Drug preparation time (IV)	6	20.0 (14.7 to 25.3)
Total treatment room time (SC)	5	14.0 (12.4 to 15.6)
Total treatment room time (IV)	7	30.6 (22.7 to 38.6)

Figure 2. Active time for drug preparation and administration by HCP



Economic impact of atezolizumab SC in the Italian perspective

- The algorithm used to compare the impact of SC and IV routes of ATZ on the HCPs active time and cost is illustrated in Figure 3

An entire course of ATZ IV implies a total of 7.9 hours of active HCPs time corresponding to € 227.55 per patient

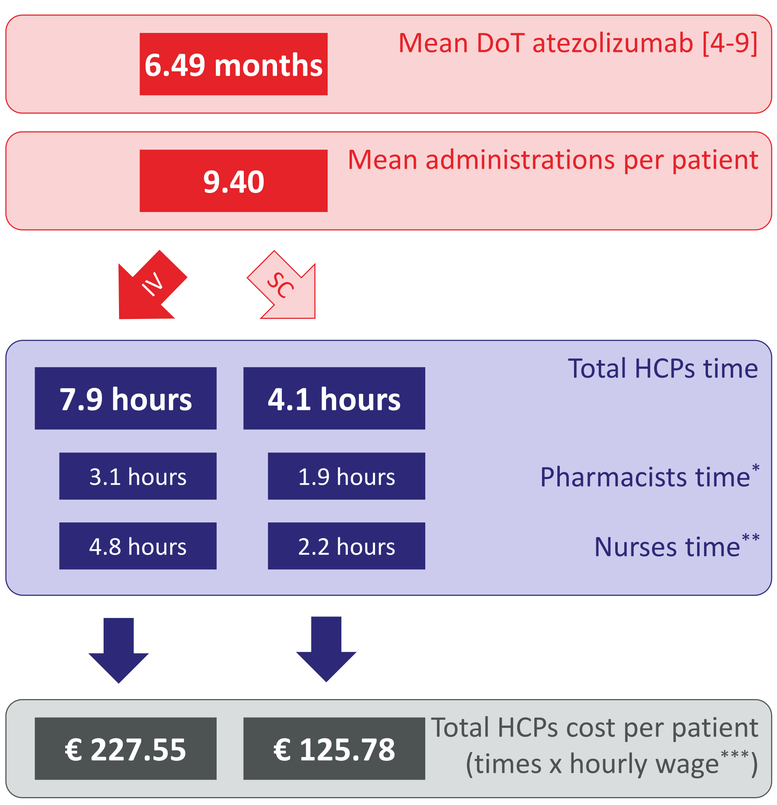
An entire course of ATZ SC implies a total of 4.1 hours of active HCPs time corresponding to € 125.78 per patient

- Considering a total of 6,638 patients potentially treated every year [Roche data on file], ATZ SC could save 25,200 hours (-47.8%) of HCP time and € 0.676 million (44.7%) compared to IV, yearly (Figure 4).

Scenario analysis

- A scenario analysis was conducted using the SC administration time observed in the IMscin001 study (7.1 minutes) [2], and the minimum infusion time for IV administration in maintenance (30 minutes)§ recommended in the SPC of ATZ [3].
- The savings associated to ATZ SC could increase up to € 0.804 million (53.7%) compared to IV (Figure 5).

Figure 3. Estimated HCPs time based on included studies in the SLR



* 47% for SC, 39.5% for IV; ** 53% for SC, 60.5% for IV; *** Hourly wage: € 42.56 for pharmacist and € 19.64 for nurse [10]. DoT: duration of treatment; HCPs: healthcare professionals

Figure 4. Impact of atezolizumab SC vs. IV: base case analysis based on SLR evidences

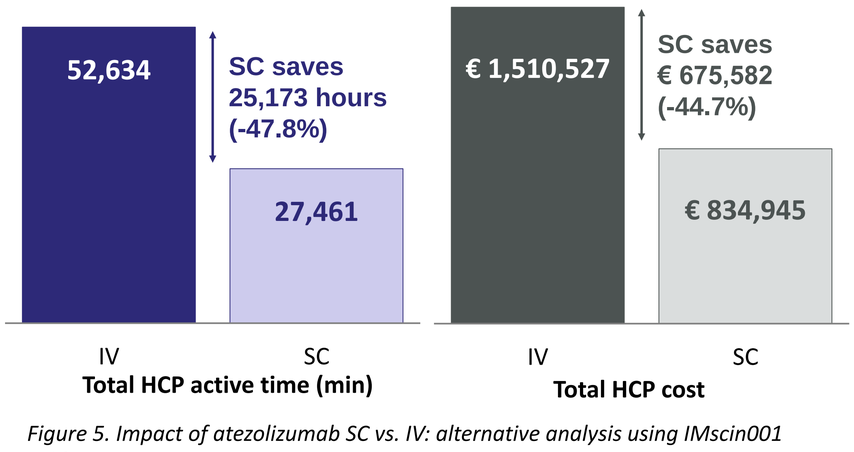
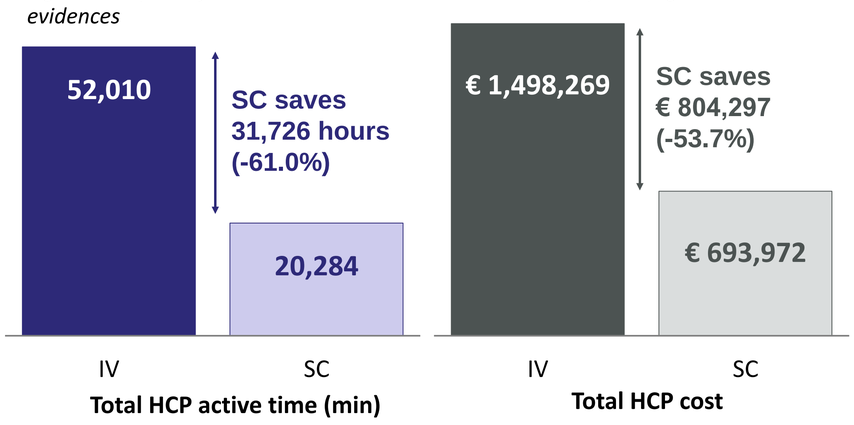


Figure 5. Impact of atezolizumab SC vs. IV: alternative analysis using IMscin001 evidences



§ At the time of abstract submission (June 2024), only data on SC administration was available in the online abstract of Burotto et al. Following the full-text publication in October 2024, which provided administration times also for IV formulations (40 minutes), the estimated savings associated with ATZ SC could exceed € 1 million (-59%) compared to IV formulation.

Conclusions

Administering atezolizumab SC instead of IV could result in cost savings for Italian hospitals by reducing HCP time for drug preparation and administration, thereby enhancing overall efficiency and financial sustainability.

Bibliography

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