

Budget impact of a 'de-escalation' strategy using micafungin for the treatment of systemic *Candida* infections in Spain and Italy

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Introduction

- Systemic *Candida* infection (SCI) is a common cause of morbidity and mortality and is associated with prolonged hospitalization and substantial care-related costs.¹⁻³
- Current treatment guidelines recommend the initial use of broad-spectrum antifungal agents, such as echinocandins, with subsequent switch to fluconazole if isolates are shown to be sensitive ('de-escalation').^{4,5}
- The model assessed the budget impact of de-escalation using micafungin as initial treatment vs escalation using fluconazole as initial treatment in Spain and Italy, both in patients with fluconazole-resistant SCI and all patients with SCI.

Methods

- *Candida* epidemiology data for Spain and Italy were taken from the literature.^{6,7}
- Fluconazole susceptibility data for Spain and Italy were based on European averages (data specifically for Spain were not available) and Tortorano et al., respectively.⁷
- Patients received either micafungin 100 mg/day or fluconazole 400 mg/day.
 - De-escalation approach: patients switched from micafungin to fluconazole after 3 days if the isolate was sensitive; fluconazole was administered for 14 days
 - Escalation approach: patients switched from fluconazole to micafungin after 3 days if the isolate was resistant; micafungin was administered for 14 days
 - If susceptibility tests revealed reduced fluconazole sensitivity, the fluconazole dose was increased to 800 mg/day
 - Patients who failed fluconazole switched to micafungin 100 mg/day; micafungin dose in those who failed micafungin 100 mg/day was increased to 200 mg/day.
- The costs considered are shown in Table 1.

Table 1. Hospitalisation and drug costs.

	Spain	Italy
Micafungin, cost per 100 mg vial (€)	428*	366‡
Fluconazole, cost per 100 mL vial (2 mg/mL) (€)	9*	19‡
General ward, cost per day (€)	665†	257§

*Colección Consejo, Catalogo de Medicamentos (Elsevier 2011); †Orden SLT/42/2012 (Spanish Ministry of Health, 2012); ‡L'Informatore Farmaceutico, Medicinali (2013); §Obtained from an average of 537 DRG codes (Accordo interregionale per la compensazione della mobilita sanitaria, 2011).

Results

- In Spain and Italy, the incidence of SCI was estimated at 4.90/100,000⁶ and 38.00/100,000⁷ population/year, respectively. Differences in incidence are probably due to source data being collected during different time periods (2010/11 vs 2006-8).^{6,7}
- Improvements in clinical success and survival rates in patients with fluconazole-

Results (cont'd)

resistant SCI resulted in savings of €6,276 and €3,979 in Spain and Italy, respectively (Table 2).

Table 2. Clinical outcomes and costs in patients with fluconazole-resistant SCI.

	Spain		Italy	
	Escalation	De-escalation	Escalation	De-escalation
Patients alive at 42 days (%)	43.3	72.2	42.6	72.2
Clinical success (%)	32.9	55.2	32.6	55.4
Hospitalisation costs* (€)	7,487	0	4,900	0
Medication costs (€)	5,941	7,152	5,369	6,290
Total costs (€)	13,428	7,152	10,269	6,290
Cost savings with de-escalation compared to escalation (€)	6,276		3,979	

*Only excess hospitalisation incurred by patients receiving inappropriate treatment was considered and is based on a study showing an excess of 7.7 days in a general ward after adjustment for all confounders.²

- For all patients with SCI, de-escalation produced a relative improvement in successful treatment of 1.0% and in survival of 1.3% in Spain, at an additional cost of €1,072/patient treated. In Italy, the relative improvements were 0.6% and 0.8%, respectively, at an additional cost of €947/patient treated.
- The budget impact per 100,000 population/year of using the de-escalation strategy rather than the escalation strategy to treat all patients with SCI was therefore €5,360 and €35,996 in Spain and Italy, respectively, reflecting the small numbers of patients needing treatment.

Conclusions

- The model supports guidelines recommending the use of a de-escalation strategy to treat SCI, showing improvements in patient outcomes compared to an escalation strategy, with limited budget impact..
- When used in patients with fluconazole-resistant SCI, the de-escalation strategy is cost saving compared to the escalation strategy in both Spain and Italy.

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