Budget impact analysis of the combined use of paracetamol and ibuprofen for the management of acute mild to moderate pain in Italy

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BACKGROUND

Pain and pain-related diseases represent relevant issues both in developed and middle- and low-income countries, with a significant impact on individuals and National Health Systems[1,2]. A recent cross-sectional one-point prevalence study based on a pain survey conducted in all the Units of an Italian Hospital in Lombardy estimated a prevalence rate for acute pain ranging from about 37% to 53% of patients, at the time of the interview and in the last 24 hours before the interview, respectively[3]. The study also estimated that patients who underwent surgery during the hospitalization had 2.7 higher odds to suffer from pain during the hospital stay, as well as patients with preexisting chronic pain had 2.6 higher odds to experience pain during the hospitalization[3]. Also, from an economic point of view, in Italy, there was a light but sustained increase in the prescriptions of pain medications in the last five years, with a total 2019 expenditure of about € 400 million euros for the Italian National Health Service[4].

OBJECTIVE

To assess the economic impact of the introduction of the fixed-dose combination of paracetamol and ibuprofen as an intravenous formulation for the short-term management of acute mild to moderate pain in Italy.

METHOD

A budget impact model was developed in order to evaluate the economic impact of the introduction on the market of the fixed-dose combination of paracetamol and ibuprofen for the management of acute mild to moderate pain in individuals over the age of 18. The analysis followed the guidelines suggested by the ISPOR. The status quo scenario considered the distribution of patients among the analgesics currently marketed in Italy between analgesic–antipyretic, opioid analgesics and NSAIDs, while in the alternative scenario the introduction on the market of the fixed-dose combination of paracetamol and ibuprofen at increasing patients share treated was simulated. The analysis was conducted from the National Health Service perspective and considering a time horizon of 3 years. Acquisition costs and costs associated with the management of adverse events related to each analgesic were considered.

Eligible population and market shares

The number of patients eligible to the fixed-dose combination of paracetamol and ibuprofen was estimated dividing the total mg dispensed in a year for each treatment (IQVIA data) for the total mg associated with a patient in a year obtained starting from the recommended dose indicated in the summary of product characteristics for each treatment. In this way, the number of eligible patients was estimated equal to 5,1 million. In the current scenario, the greatest number of these patients are treated with paracetamol (about 53% of eligible patients), following by ibuprofen (about 28%) and paracetamol in association with ibuprofen (10%).
In the alternative scenario, the analysis simulated that 7.2%, 10.2% and 11.2% of eligible patients at the first, second and third year of the analysis are treated with the new treatment option.

Safety

The incidence of adverse events for each treatment considered in the analysis were obtained from the literature. Because no studies emerged for this specific patient population, from the literature it was selected a systematic review related to chronic noncancer pain including 83 trials comparing opioids with placebo and 12 trials comparing opioids with NSAIDs[5]. Table 1 shows the incidence of adverse events reported in the study obtained from the literature and used in the budget impact analysis.

Table 1: Incidence of adverse events for each treatment in analysis

	Nausea	Constipation	Headache	Pruritis	Vomiting
Analgesic–antipyretic	8.2%	5.3%	7.8%	3.8%	-
NSAIDs	7.6%	3.2%	9.8%	1.5%	1.7%
Opioid analgesics	22.5%	12.6%	11.1%	7.8%	7.9%

Cost parameters

Acquisition cost for each treatment considered in the analysis was calculated multiplying the net ex-factory price for mg for the recommended dose indicated in the summary of product characteristics of each treatment. Cost associated with the management of each adverse event was obtained from the literature or using therapeutic indications from Italian Medicines Agency (table 2).

Table 2: Cost of adverse events

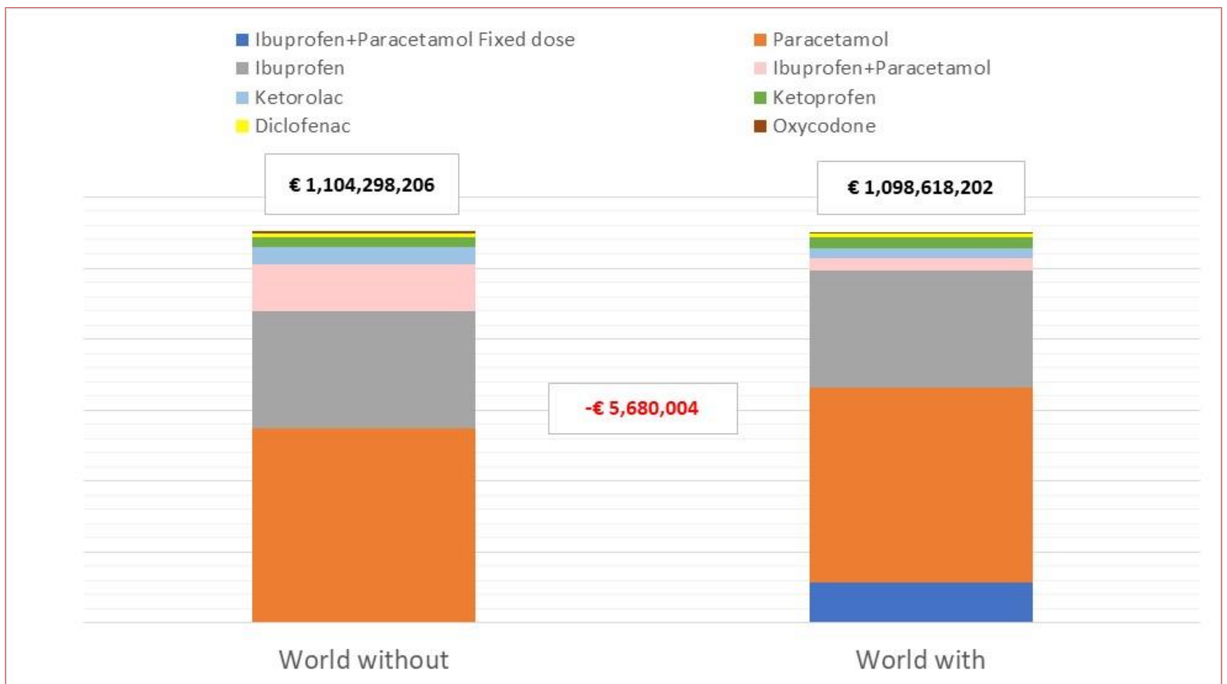
Adverse event	Cost	Reference
Nausea	€ 375.00	Mickisch et al. 2010[6]
Constipation	€ 174.05	FARMADATI and Italian Medicines Agency (Relistor 12 mg administered subcutaneously at least 4 weekly doses, up to once daily)[7]
Headache	€ 255.00	Wehler et al. 2015 (only outpatient cost)[8]
Pruritis	€ 11.97	Favaretto et al. 2017 (Cetirizine 1 cp/die for 7 days + dexamethasone 4mg for 7 days)[9]
Vomiting	€ 64.00	Wehler et al. 2015 (only outpatient cost)[8]

RESULTS

The model estimated an annual expenditure associated with the management of acute mild to moderate pain in Italy of about € 368.1 million. The introduction of the fixed-dose combination of paracetamol and ibuprofen could generate a reduction of expenditure incurred by National Health Service (NHS) of about € 0.9, € 2.2, € 2.6 million in the first, second and third year of analysis, respectively (Figure 1), with a cumulative saving of about € 5.7 million (Figure 2).

Figure 1: Budget impact per year and cost item

Figure 2: Cumulative costs per scenario and treatment – Year 3



CONCLUSIONS

The analysis shown how the introduction of the fixed-dose combination of paracetamol and ibuprofen for the management of acute mild to moderate pain in Italy could generate a reduction in the expenditure incurred by the NHS, both in terms of pharmaceutical expenditure and in terms of expenditure associated with the management of adverse events.

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