POPULATION-BASED BUDGET IMPACT MODEL OF APREPITANT (EMEND®) IN HIGHLY EMETOGENIC CISPLATIN-BASED CHEMOTHERAPY (HEC)

K. Le Lay[1], T. Souchet[2], Y. Briand[2], R. Launois[1,3]

[1] REES France, Paris *(France)* ; [2] MERCK SHARP & DOHME-CHIBRET ; [3] Université de Paris XIII, Bobigny *(France)*

INTRODUCTION: *Chemotherapy-induced nausea and vomiting (CINV) are among the most intolerable side-effects of treatment. In 2003, aprepitant, first NK1 antagonist, obtained a market authorization for prevention of chemotherapy induced nausea and vomiting in cisplatin based chemotherapy. In combination with a corticosteroid and a 5-HT3 antagonist during the acute phase (day 1), and with a corticosteroid in the delayed phase (day 2 and 3), aprepitant demonstrated a superior efficacy over standard therapy (combination of corticosteroid and HT3 antagonist) in the prevention of CINV. Combined results of two clinicals trials demonstrated a 20 % increase of the patients with a complete response (no vomiting and no rescue therapy) in the aprepitant group over the standard therapy (67.7 % v 47.8 %, p < 0.01). More patients in the aprepitant group reported minimal or no impact of CINV on daily life (74.4 % v 63.9 % ; p < 0.001)[1].*

OBJECTIVES: *To evaluate the budget impact on the French Health Insurance following the launch of aprepitant.*

METHODS

1. Definition of the patient population

Patients receiving a cisplatin-based chemotherapy with a single administration per cycle, in combination with an anti emetic treatment including a 5-HT3 antagonist.

Aprepitant is added to a 5-HT3 antagonist during the acute phase. During the delayed phase, it can either be added or substituted to a 5-HT3 antagonist.

Data source: *IMS Health ONCO Analyzer (2002)*

2. Costs of antiemetic treatments

Patients were split into 2 groups: those receiving a 5-HT3 antagonist both in acute and delayed phase and those receiving a 5-HT3 antagonist only during acute phase.

For each group, cost of anti emetic therapy per cycle was calculated.

Two types of costs were calculated:

- one for public hospitals (named "hospitals") using hospital listing price,
- and one for private hospitals and retail pharmacies (named "private/ambulatory care") based on ex factory price.

For both hospital and private/ambulatory care, the cost of aprepitant was based on an ex factory price of 20 € for the acute phase and of 40 € in the delayed one.

Costs are fully covered by the French Health Insurance.

Data source: *IMS Health ONCO Analyzer (2002) and GERS (2002)*

3. Budget Impact model

The budget impact model was built over a four year period (2005-2008).

3.1 Base-line assumptions

- Based on current trend, the number of cisplatin-based chemotherapy cycles decreases by 5 % per year (IMS LMHP).
- 41 % and 59 % of patients receive cisplatin based chemotherapy respectively in private hospitals and in public hospitals (IMS EHPP-LMHP 2002).
- For the delayed phase, 76 % and 24 % of patients receive aprepitant respectively in private/ambulatory care and in hospitals (IMS EHPP-LMHP 2002).
- The percentage of use of aprepitant in HEC patients and the percentage of use of aprepitant in the delayed phase as a the substitution to 5-HT3 antagonists are displayed in the table below. Mean duration of use of 5-HT3 during the delayed phase is 3;7 days (IMS ONCO Analyzer).

	Year 1	Year 2	Year 3	Year 4
% of use in HEC patients	10 %	15 %	20 %	25 %
% of use in the delayed phase as a substitution to 5-HT3 antagonists	30 %	50 %	70 %	90 %

3.2 Calculations

This budget impact is only based on drug costs.

Results are expressed for for 10,000 (hypothetical) highly emetogenic chemotherapy (HEC) cycles in combination anti emetic regimen including a 5-HT3 antagonist.

3.3 Sensitivity analyses

- Penetration rate of aprepitant: 14 %, 32 %, 58 % and 69 % respectively the first, second, third and the fourth year.
- 10 % discount of the hospital price of 5-HT3 antagonists.
- Reduction in the substitution rate: 20 %, 40 %, 60 % and 80 % respectively the first, second, third and the fourth year.

RESULTS

1. Patients population

- Antiemetic regimen including a 5-HT3 antagonist are administered to 76 % of patients receiving cisplatin based chemotherapy.
- 48 % of these patients received a 5-HT3 antagonist during only the acute phase, and 52 % during both the acute and the delayed phase.

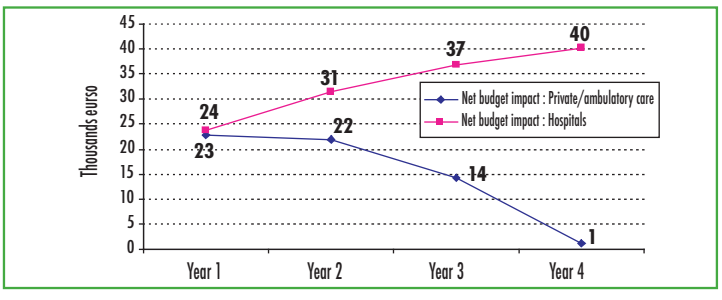
2. Costs of antiemetic treatments

Average price of 5-HT3 antagonists per cycle (€ 2002) (n = 10 000)	Private/Ambulatory care	Hospitals
5-HT3 antagonist during acute phase only: (n = 3300)	26,96	33,02
5-HT3 antagonist during acute phase and delayed one:		
– acute phase	28,12	37,80
– delayed phase (n = 6700)	83,13	109,70

3. Impact budget under base-line assumptions

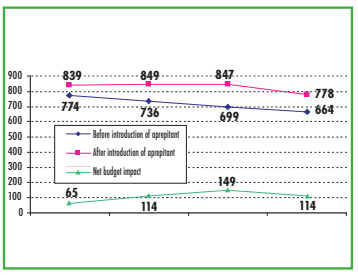
Euros (000)	Year 1	Year 2	Year 3	Year 4
Without aprepitant	774	736	699	664
With aprepitant	821	789	750	705
Net budget impact	46	53	51	41
% of increase	5.9 %	7.2 %	7.3 %	6.2 %

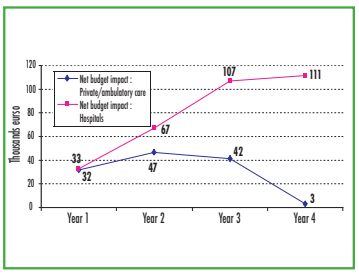
Over the study period the net budget impact increase is about 6 % per year.



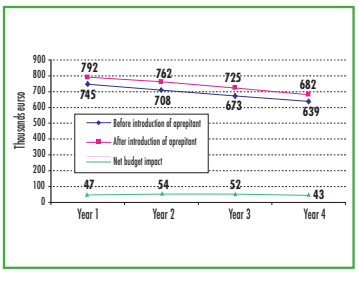
4. Sensitivity analysis

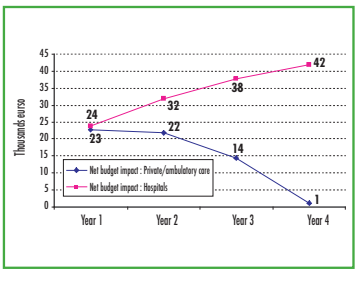
4.1 With an increase of use in HEC cycles



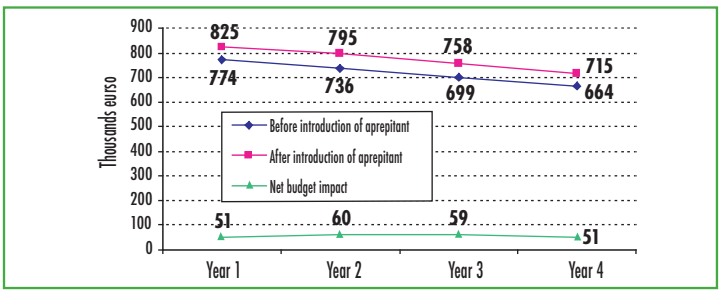


4.2 With a 10 % discount of the hospital price of 5-HT3 antagonists





4.3 With a reduction of the substitution rate



- This budget impact analysis was only based on drug cost and does not take into consideration the reduction of health care resources related to better control of vomiting. From this perspective the results can be considered as conservative.
- Hospital drug costs were based on the listing prices on which some discounts may be confidentially applied.
- There is no historical basis for reliably estimating penetration rate of a new technology.

CONCLUSION: For a limited annual net budget increase and a significant improvement in clinical outcome, aprepitant represents a major progress in the the prevention of CINV in highly emetogenic cisplatin based chemotherapy.

References:

[1] De Wit R *et al.* The oral NK_1 antagonist, aprepitant, given with standard antiemetics provides protection against nausea and vomiting over multiple cycles of cisplatin-based chemotherapy: a combined analysis of two randomised, placebo-controlled phase III clinical trials. *European Journal of Cancer*, 2004, 40: 403-410.