A Cost Minimization Analysis of the Use of Propofol in Prefilled Syringes As a Tool to Support Decision Making

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INTRODUCTION

The choice of total intravenous anesthesia (TVA) with propofol has been widely disseminated in clinical practice for induction and maintenance of general anesthesia, and is currently the technique of choice for several types of surgeries. However, the preparation and administration of medications, especially anesthetics, in the perioperative environment represent challenges for patient safety. The high risk of handling errors, contamination during the preparation of intravenous drugs and medication errors can produce serious damage to the health of patients, with a high financial burden on hospitals and health systems. In this context, one of the strategies used to reduce the risk of medication errors and optimize AVT is the use of drugs marketed in prefilled syringes (PFS).

OBJECTIVE

Conduct cost minimization and budgetary impact assessment comparing the costs of using propofol in a pre-filled syringe (PFS) and in an ampoule vial for use in general anesthesia in a hospital environment.

METHOD

The cost-minimization analysis was conducted from the perspective of a private hospital, over a time horizon of one year. Patients (children or adults of both sexes) who underwent surgical procedures that require total intravenous anesthesia (TVA) with propofol was included. It was considered that propofol in vials would be manipulated in a hospital environment by the team of anesthetists to make syringes with the appropriate dose for use during surgery. Economic outcomes include the acquisition of medicines, the workload of professionals and inputs needed to handle propofol FA, as well as the costs of consequences of possible medication errors and bacterial contamination. A decision-tree model was developed to estimate the economic consequences of using of the different presentations of propofol. A budgetary impact analysis of the implementation of propofol was carried out nested with the ACE presented previously, and therefore, considers the same consequences and costs described in the ACM.

RESULTS

The CMA demonstrated that Diprivan® PFS is the lowest cost alternative when compared to the use of propofol in vials, representing a savings of - R$ 1,133.68 per patient. At the context of one year, when simulating 500 surgeries performed, this savings represents - R$ 566,838.69. A budgetary impact analysis demonstrated a significant cost reduction in the scenario proposed by including propofol PFS, generating savings that ranged from - R$ 113,367 in the first year, to - R$ 430,797 in the fifth year. The total accumulated in five years was - R$ 1,247,045.

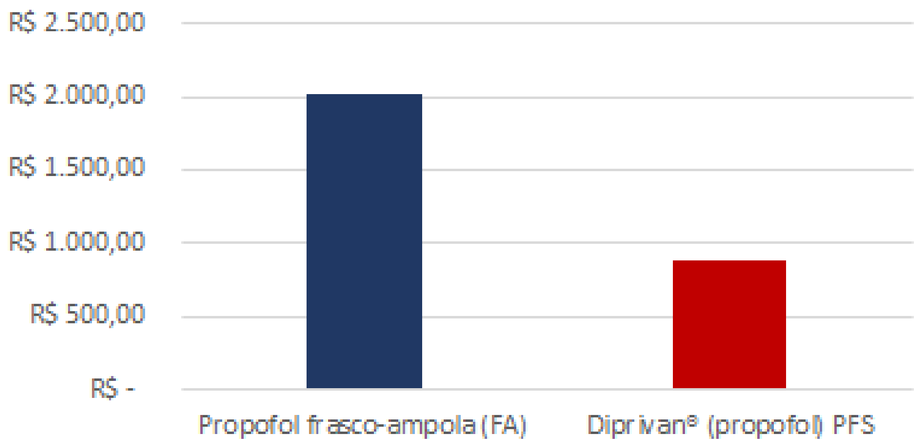

Figure 1. Result of the cost-minimization analysis.

Source: prepared by the authors. Legend: FA: vial-ampoule; PFS: pre-filled syringe. Cost in Brazilian Reais.

Table 1. Estimated the cost by patients for each market share and intervention scenario.

Type of technology	Year 1	Year 2	Year 3	Year 4	Year 5	Cumulative in 5 years
Current Scenario (R$)						
Propofol FA	1.010.612	1.212.734	1.414.857	1.616.979	1.819.101	7.074.283
Diprivan® PFS	0	0	0	0	0	0
Proposed Scenario (R$)						
Propofol FA	808.489	929.763	1.010.612	1.051.036	1.051.036	4.850.937
Diprivan® PFS	88.755	124.256	177.509	248.513	337.268	976.301
Proposed Scenario						
Budget impact	-113.368	-158.715	-226.735	-317.430	-430.797	-1.247.045

Table 2. Results of the cost-minimization analysis.

Type of technology	Cost per patient	Cost per 500 surgeries performed
Propofol vial-ampoule (FA) Diprivan® (propofol) PFS	R$ 2.021,22	**R$ 1.010.611,82**
Propofol vial-ampoule (FA) Diprivan® (propofol) PFS	R$ 887,55	**R$ 443.773,14**
Propofol vial-ampoule (FA) Diprivan® (propofol) PFS	**- R$ 1.133,68**	**- R$ 566.838,69**

CONCLUSIONS

Despite presenting a higher direct acquisition cost, the PFS presentation is capable of reducing substantial costs related to medication errors and bacterial contamination, which can consume resources and prolong the hospitalization time of patients.

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