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Cost-Effectiveness of Efmoroctocog Alfa in Treatment of Severe Hemophilia A Patients in Turkey

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INTRODUCTION

Hemophilia A is a rare, inherited, life-long bleeding disorder characterized by bleeding due to reduced levels of clotting factor VIII (FVIII) (Srivastava et al,2013). Replacing FVIII is the current standard of care supported by major clinical guidelines (Keeling et al, 2008; Rocino et al, 2014; Teitel, 1998). Efmoroctocog Alfa is a recombinant fusion protein (recombinant VIII-Fc, referred herein as rFVIIIFC) that provides extended half-life factor therapy. The efficacy and safety of rVIIIFc is established in clinical studies involving adults and children with hemophilia A [A-LONG (Mahlangu et al, 2014), Kids A-LONG (Young et al, 2015), ASPIRE (Nolan et al, 2016)].

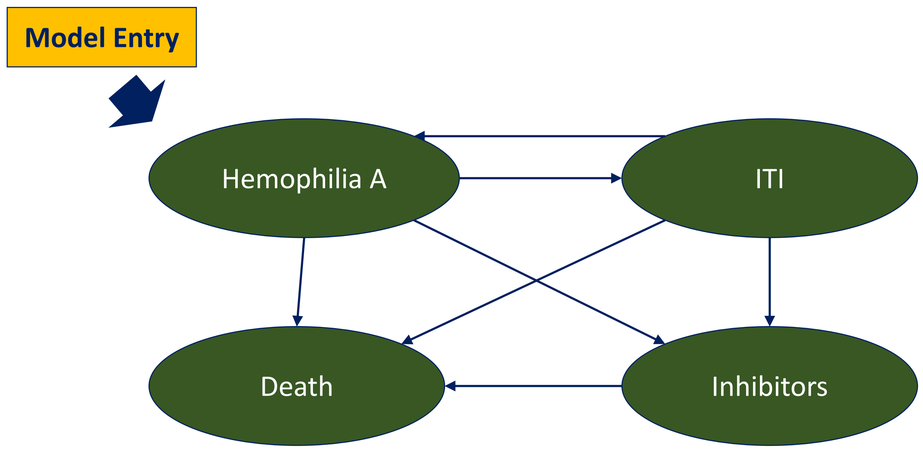
OBJECTIVES

The objective of this study is to explore the cost-effectiveness of efmoroctocog alfa (a recombinant factor VIII-Fc fusion protein, herein rFVIIIFc) prophylactic treatment in previously treated severe hemophilia A patients in comparison to standard recombinant FVIII (rFVIII).

METHODS

A Markov model was developed (Figure 1) with annual bleeding rates as the primary outcome. All patients enter the model in the 'hemophilia A' state and receive clotting factor therapy. Effectiveness data for rFVIIIFc were obtained from A-LONG and Kids A-LONG clinical studies. An indirect comparison was made with rFVIII. Data for rFVIIIFc were derived from the individualized prophylactic arm in A-LONG. Data for other rFVIII products were identified via a literature search for clinical studies or post-marketing surveillance studies of routine prophylactic treatment of previously treated subjects with severe hemophilia A using an rFVIII product. Table 1 presents the clinical effectiveness data used in the model. The analysis was made from the Turkish healthcare payer perspective (SSI). Only drug acquisition costs were included in the cost component of the model. One-way and probabilistic sensitivity analysis were made. All outcomes and costs were discounted by 3%. The ICER was calculated for both life years and QALYs. rFVIIIFc and rFVIII are marketed with 250, 500, 1000,1500, 2000 IUs and the analyses were made for all forms.

Figure 1: Markov Model



ITI: Immune Tolerance Induction

Table 1: Clinical Data

Input	Value	Input	Value	Input	Value
Annual probability of inhibitor relapse	0.41%	Annual bleeding incidence rFVIII <6 years	1.50	Weekly prophylactic dose,6 to <12, IU/kg, rFVIII	102.50
Fraction with inhibitors sent to ITI (<12y)	90.0%	Annual bleeding incidence rFVIIIFc <6 years	0.00	Weekly prophylactic dose,6 to <12, IU/kg, rFVIIIFc	87.76
Fraction with inhibitors sent to ITI (>12y)	80.0%	Annual bleeding incidence rFVIII 6 to <12	2.50	Weekly prophylactic dose,12+ , IU/kg, rFVIII	78.00
ITI success probability 1st year	25.4%	Annual bleeding incidence rFVIIIFc 6 to <12	2.01	Weekly prophylactic dose, 12+, IU/kg, rFVIIIFc	79.20
ITI success probability 2nd year	29.1%	Annual bleeding incidence rFVIII 12 +	6.00	Dose required per bleeding, IU/kg, rFVIII	57.50
ITI success probability 3rd year	32.3%	Annual bleeding incidence rFVIIIFc 12 +	1.60	Dose required per bleeding, IU/kg, rFVIIIFc	31.43
Adherence to prophylactic rFVIII	80.0%	Weekly prophylactic dose,<6, IU/kg, rFVIII	97.75	ITI weekly dose, IU/kg, rFVIII	1400
Adherence to prophylactic rFVIIIFc	86.0%	Weekly prophylactic dose,<6, IU/kg, rFVIIIFc	90.55	ITI weekly dose, IU/kg, rFVIIIFc	1422

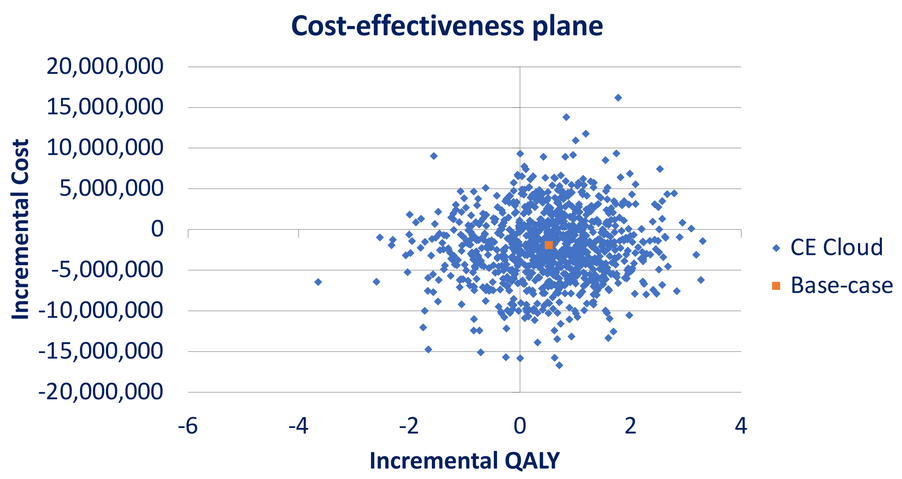
Mahlangu et al, 2014; Shapiro et al, 2014; Young et al, 2015

RESULTS

Table2: Cost-Effectiveness Analysis Results

		Cost (TRY)	Incremental Cost (TRY)	QALYs	Incremental QALYs	ICER
250 IU	rFVIIIFc	37,507,549	-2,589,665	24.92	0.52	Dominates
	rFVIII	40,097,214		24.40		
500 IU	rFVIIIFc	31,198,447	-2,426,745	24.92	0.52	Dominates
	rFVIII	33,625,192		24.40		
1000 IU	rFVIIIFc	33,469,724	-2,194,599	24.92	0.52	Dominates
	rFVIII	35,664,323		24.40		
1500 IU	rFVIIIFc	30,273,112	-1,933,555	24.92	0.52	Dominates
	rFVIII	32,206,667		24.40		
2000 IU	rFVIIIFc	30,272,112	-1,933,555	24.92	0.52	Dominates
	rFVIII	32,206,667		24.40		

Figure 2: Cost-Effectiveness Plane for 1500 IU



The life years gained were 29.15 and 29.03 for rFVIIIFc and rFVIII respectively (incremental life years: 0.12). The QALYs gained were 24.92 and 24.40 (incremental QALY: 0.52) for rFVIIIFc and rFVIII respectively. The utilities were derived from No one et al (2013). In all comparisons, rFVIIIFc yielded lower annual costs compared to rFVIII and dominated the results for both life years and QALYs. The sensitivity analyses results showed that the findings were robust (Figure 2).

CONCLUSION

The analyses have shown that rFVIIIFc is a cost-effective option in treatment of prophylactic treatment for previously treated severe hemophilia A patients in comparison to standard recombinant FVIII in the Turkish health care system

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