COST-EFFECTIVENESS OF PALIVIZUMAB FOR RESPIRATORY SYNCYTIAL VIRUS PROPHYLAXIS AMONG EXTREME PRETERM INFANTS (≤29 WEEKS OF GESTATIONAL AGE) AT THE SOCIAL SECURITY MEXICAN INSTITUTE (IMSS)

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INTRODUCTION

Viral respiratory infection (VRI), including bronchiolitis, is the main cause of hospitalization in pediatric patients under 2 years of age. It is estimated that hospital expenses secondary to this disease reach up to $1.4 billion, resulting in a significant public health burden; research on hospitalizations for VRI showed that the main etiologic agent was respiratory syncytial virus (RSV). RSV is a common and highly contagious viral agent, and it is estimated that 95% of children experience at least one infection before two years of age. Extreme prematurity (birth at ≤29 weeks) is a significant and known risk factor for severe RSV infection.

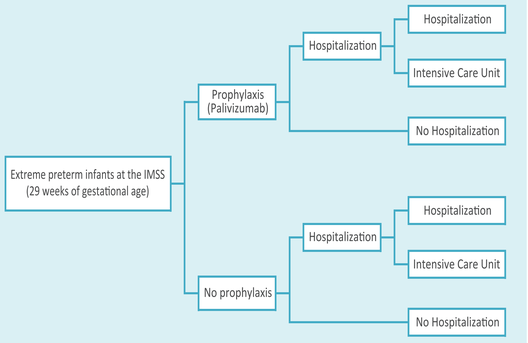
OBJECTIVES

To assess the cost effectiveness of palivizumab in extreme preterm infants (equal to or lees than 29 weeks of gestational age) at the Social Security Mexican Institute (IMSS).

METHODS

A decision tree model was developed employing data published by IMSS in 2019 from the System of Information of Integral Health Care and the hospital records of the System of Medical Statistics (DataMart) of the IMSS and the databases of Family Medicine Units. The comparator was no prophylaxis (Illustration 1).

Illustration 1. Simplified model Structure (Palivizumab for Respiratory Syncytial Virus Prophylaxis)



The primary perspective of the study was that of the IMSS. The cost included in the analysis were the administration of palivizumab, hospital care for RSV infections and the average length of stay (ALOS) in a hospital. The attention costs used in this analysis was also obtained from the annual information published by the IMSS regarding Hospital Products as well the mean hospital stays. The primary efficacy outcome in the palivizumab clinical trials was the number of RSV hospitalizations avoided.

Table 1. Model parameters (no prophylaxis vs prophylaxis)

Base case. Extreme preterm infants (29 weeks of gestational age) at the IMSS		
Patients treated (both scenarios)	25	Cisneros 2019
Average hospitalization days per event	7.62	Cisneros 2019
Length of hospital stay (days)	190.50	Estimated
No prophylaxis		
RSV Hospitalization probablity	0.70	Prais 2016
Hospitalization	45%	Shi 2017
Days	60.01	Estimated
Cost	$20,959	Estimated
Days in ICU	55%	Shi 2017
Days	73.34	Estimated
Cost	$117,234	Estimated
NO prophylaxis, total cost	$138,193	Estimated
Prophylaxis		
RSV Hospitalization probablity	0.33	Prais 2016
Hospitalization	45%	Shi 2017
Days	28.29	Estimated
Cost	$9,881	Estimated
Days in ICU	55%	Shi 2017
Days	34.58	Estimated
Cost	$55,267	Estimated
Total cost of lenth of stay associated to prophylaxis	$65,148	Estimated
Cost of prophylaxis	$28,993	Estimated
Total cost of prophylaxis	$94,141	Estimated
Difference in the expected cost prophylaxis vs no prophylaxis (25 patients)		
Prophylaxis expected cost	$94,141	-$44,052
No Prophylaxis expected cost	$138,193	Reference
Difference in the expected cost prophylaxis vs no prophylaxis (per patient)		
Prophylaxis expected cost	$3,766	-$1,762
No Prophylaxis expected cost	$5,528	Reference

RESULTS

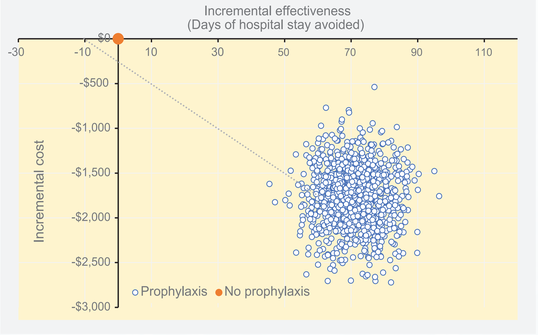
The expected cost was $5,271USD (95% CI, $4,744.40 to $5,798.71) in the palivizumab group and $7,086USD (95% CI, $6,378.14 to $7,795.50) for the no prophylaxis strategy. Effectiveness yield to 2.5 (95% CI, 2.39 to 2.64) hospitalization days vs 5.3 (95% CI, 5.07 to 5.60) for the no prophylaxis group (2.8 days less hospitalization days with palivizumab). For the extreme preterm newborns group palivizumab prophylaxis was a dominant Strategy.

Table 2. Base case

Estrategia	Cost	Incremental cost	Effectiveness	Incremental Effectiveness	ICER
Prophylaxis	$3,765.63	Reference	63	Reference	Reference
No prophylaxis	$5,527.72	-$1,762.09	133	70	Dominated

The results in the probabilistic sensitivity analysis were consistent with the base case analysis. Palivizumab (prophylaxis) is a in a dominant alternative (Illustration 2).

Illustration 2. Probabilistic Sensitivity Analysis



CONCLUSIONS

Palivizumab (prophylaxis) for extreme preterm newborns (birth at ≤29 weeks) resulted in a dominant alternative.

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