

Clinical and economic impact of Glucagon-like Peptide-1 Agonist in Patients with obstructive Sleep Apnea and Obesity: An Exploratory Analysis

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Context

Obstructive sleep apnea (OSA) is a disease present among 6.5 to 9% of women and between 17-31% of men. (1,2,3,4)

In which obstruction of the upper airway with subsequent physiological alterations that include sympathetic activation, hypoxemia and sleep fragmentation, determining an increase in the morbidity and mortality of those who suffer from it due to cardiovascular, metabolic, and neurological conditions, among others (5).

Obesity is the main condition of OSA (5, 6, 7) and therefore it should be also a fundamental pillar in its therapeutic intervention.

Glucagon-like peptide 1 (GLP-1) receptor agonists (8,9,10) have demonstrated important benefits in glycaemic control and lasting weight loss, which is relevant for patients with OSA and obesity, in whom, in addition to weight reduction, mitigation of cardiovascular and metabolic risk, reduction of AHI has been documented.

Under the context, it is relevant to consider GLP-1 as a treatment option in those who cannot use or are not adherent to continuous positive airway pressure (CPAP) and suffer from OSA and obesity.

Objective

Assess the cost-utility of the glucagon-like peptide-1 agonists use in patients with obstructive sleep apnea (OSA) and Obesity who are unable or unwilling to use continuous positive airway pressure (CPAP) versus no treatment in Colombia.

Methods

Population:

Patients:

- With moderate or severe OSA (<40 events/hour according to the apnea-hypopnea index AHI)
- Unable or unwilling to use CPAP
- < 50 years
- With a body mass index BMI ≥ 30
- Obesity duration < 5 years

Time horizon: 1 year

Outlook: Health System

Costs:

- Direct Medical Costs
- Liraglutide cost was estimated based on the National Drugs Pricing Information System (SISMED)
- Complications costs were based on

Alternatives:

GLP-1 (Liraglutide 3.0 mg)
No treatment

Outcomes:

Clinical data were based on the SCALE Sleep Apnea clinical trial (11), complications were estimated as population attributable fractions (12,13).

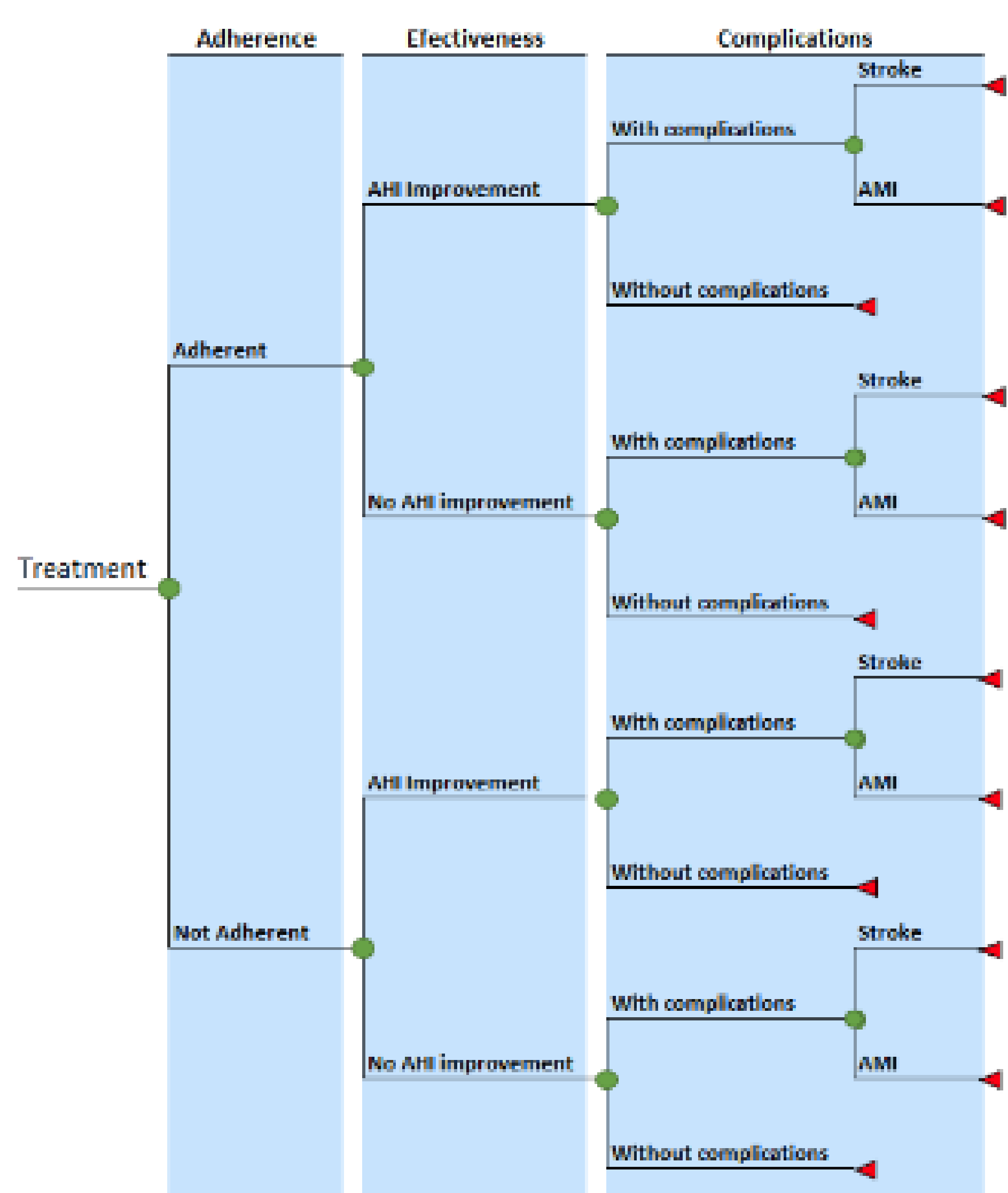
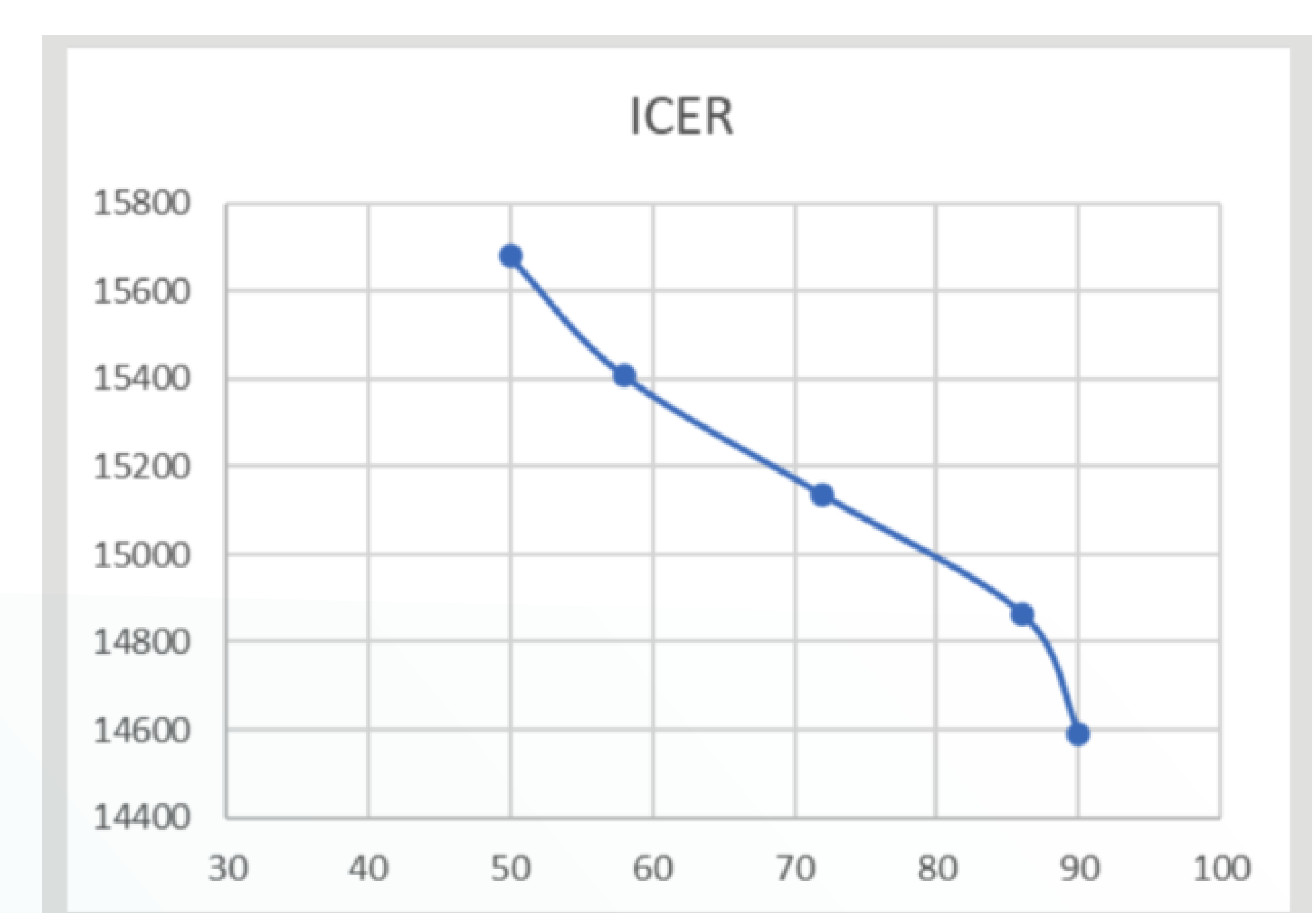
- Improvement in Apnea-Hypopnea Index (AHI), measured as a decrease of at least 15 events/hour.
- Improvement in obesity, defined as the decrease of at least 10% of body weight.
- Number of stroke and acute myocardial infarction (AMI) events averted calculated from fractions attributable to both OSA and obesity.
- Quality-Adjusted Life Years (QALY).

Results

Parameters

Variable	GLP1	No treatment	No treatment
Mejoría SAHOS	100,00%	0,00%	
Mejoría obesidad	60,00%	0,00%	PI-Sunyer et al. (2015)
Probabilidad ACV paciente apnea leve	1,65%	1,65%	
Probabilidad ACV paciente apnea severa	1,90%	1,90%	
Probabilidad IAM paciente apnea leve	1,89%	1,89%	
Probabilidad IAM paciente apnea severa	2,90%	2,90%	
Probabilidad ACV paciente obesidad	1,90%	1,90%	
Probabilidad ACV paciente NO obesidad	1,33%	1,33%	
Probabilidad IAM paciente obesidad	2,90%	2,90%	
Probabilidad IAM paciente NO obesidad	2,09%	2,09%	
Utilidad apnea leve	0,811	0,811	
Utilidad apnea severa	0,738	0,738	
Utilidad ACV apnea leve	0,649	0,649	
Utilidad ACV apnea severa	0,59	0,59	
Utilidad IAM apnea leve	0,73	0,73	
Utilidad IAM apnea severa	0,664	0,664	
Costo Tratamiento	3.855.456	0	
Costos ACV	6.439.580	6.439.580	
Costos IAM	8.841.726	8.841.726	
Tasa de cambio (\$COP/USD)	3800	3800	

	GLP1	No tratamiento	Diferencia	Δ%
Mejoría SAHOS	1005,20	0,00	-1005,20	
NO mejoría SAHOS	0,00	1005,20	1005,20	
Pacientes con ACV atribuible a SAHOS	16,59	19,10	2,51	
Pacientes con IAM atribuible a SAHOS	19,02	29,15	10,13	
AVAC	800,91	736,85	-64,05	-8,69%
Mejoría Obesidad	603,12	0,00	-603,12	
No Mejoría Obesidad	0,00	1005,20	1005,20	
Pacientes con ACV atribuible a Obesidad	8,01	19,10	11,09	
Pacientes con IAM atribuible a Obesidad	12,58	29,15	16,58	
Eventos totales ACV	24,60	38,20	13,60	35,61%
Eventos totales IAM	31,59	58,30	26,71	45,81%
Costo total	4.313.227.831	761.461.643	-3.551.766.188	-3.533.400
ICER(\$COP)			55.450.115	
ICER(USD)			14.592	



Discussion

This analysis assesses the cost-utility of liraglutide use in patients with obstructive sleep apnea (OSA), who are unable or unwilling to use continuous positive airway pressure (CPAP) versus no treatment, in the context of the health system in Colombia. The results presented show that liraglutide reduce the presence of complications like stroke (36%) and AMI (44.9%), with a calculated ICER of the USD 13,875/QALY.

The association between obesity, and adverse cardiovascular events has been extensively described in the literature, as long as its relationship with OSA and its complications. The use of the new therapies to control obesity, additional to the changes in nutrition and physical activity deserves to be assessed in the context of limitation of resources.

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This analysis should be viewed in the contexts of many limitations, mainly associated with the model assumptions, for example, the prevalence of adults with obesity for least than 5 years. Although the ICER is above the umbral determined for the IETS (Local HTA agency) for the country, the option could be considered under specific scenarios, including patients with additional cardiovascular risk, like the presence of diabetes, and that can be analyzed in future studies.

Conclusion

1

Based on the assumptions of this analysis, glucagon-like peptide-1 agonists may be a cost-effective alternative for patients who are unable or unwilling to use continuous positive airway pressure (CPAP).

2

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