Cost-Utility of Intramuscular Testosterone for Men and Male Adolescents With OrganicHypogonadotropic Hypogonadism in Brazil

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CONTEXT

Organic hypogonadotropic hypogonadism (OHH) is a rare endocrine disorder characterized by deficient gonadotropin secretion, resulting in impaired gonadal function

Testosterone replacement (TR) is the standard of care for men and male adolescents with OHH, yet in Brazil, this therapy is not provided within the public health system (SUS)

Patients face substantial financial burden as treatment costs are entirely patient-borne

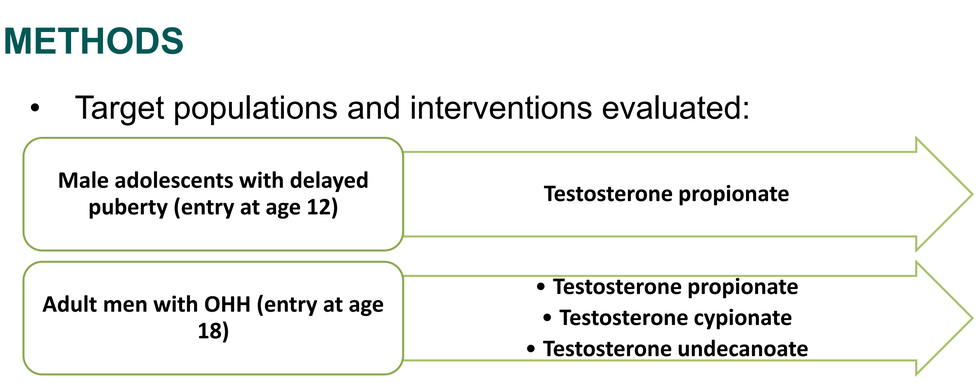
Clinical consequences of untreated OHH include delayed puberty in adolescents, reduced muscle mass, osteoporosis, increased fracture risk, and cardiovascular morbidity in adults

OBJECTIVE

To assess the cost-utility of intramuscular testosterone therapy for male adolescents and adults with OHH from the Brazilian SUS perspective

METHODS

- Target populations and interventions evaluated:



- Comparator: No hormone replacement
- Decision tree + Markov model with lifetime horizon and yearly cycle
- Discount rate 5% for costs and effectiveness
- Input parameters taken from literature, including:
- High uncertainty in cardiovascular (CV) risk (OR: 0.81, 95% CI 0.33-2.00)
- Utilities for OHH health states obtained from a time trade-off study

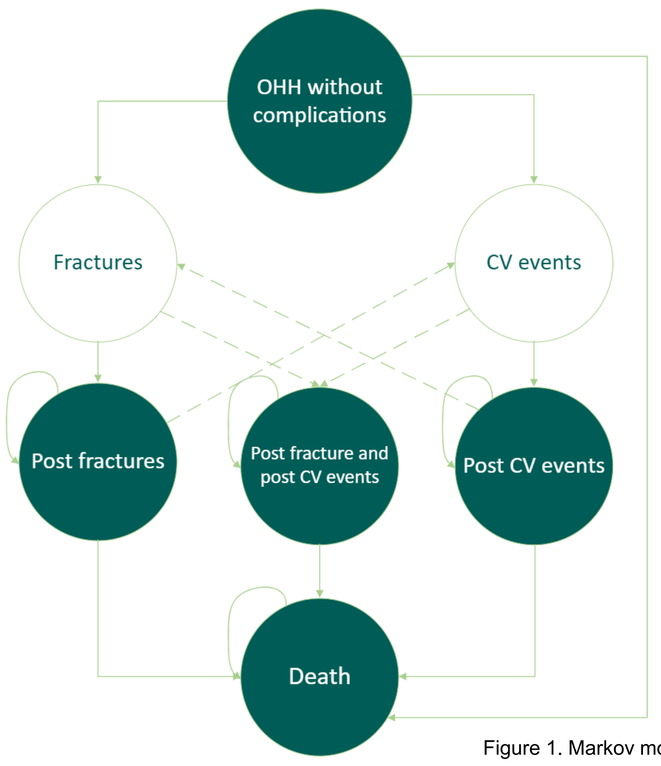


Figure 1. Markov model structure

RESULTS

For adolescents, testosterone propionate achieved an incremental cost-effectiveness ratio of R$ 2,774.15 per QALY gained, while for adults, all three testosterone formulations demonstrated ICERs well below cost-effectiveness thresholds.

Table 1. Base case results

Population	Testosterone	ICER (R$/QALY)
Adolescents	Propionate	R$2,774.15
Adults	Propionate	R$4,044.39
	Undecanoate	R$5,382.33
	Cypionate	R$6,874.62

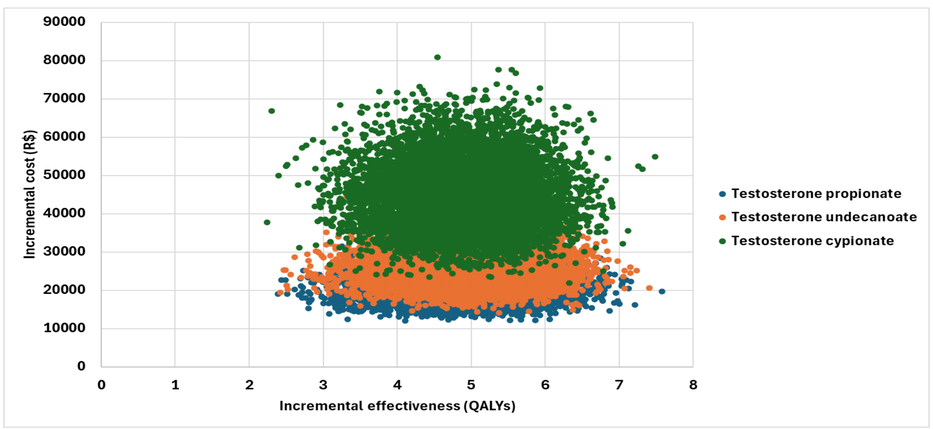


Figure 2. Probabilistic sensitivity analyses for adult populations

- The deterministic analysis identified utility values for OHH health states, annual testosterone costs, and cardiovascular event odds ratios as the most influential parameters on cost-effectiveness ratios.
- Inconsistency regarding testosterone's CV safety may be justified by the fact that most of the primary studies included patients with functional hypogonadism
- The probability of cost-effectiveness exceeded 99% for all testosterone technologies at conventional thresholds (R$ 120,000 for rare diseases), indicating exceptional stability of results despite inherent uncertainties in model parameters

CONCLUSION

Testosterone replacement therapy represents exceptional value for money in treating OHH, providing compelling economic evidence for public health system inclusion in Brazil.

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