Cost-effectiveness Analysis of Reference Recombinant Human Follicle-stimulating Hormone Alfa (r-hFSH-alfa) and Urinary Highly Purified Menopausal Gonadotropin (hMG-HP) Based on Data From A Large German Registry

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CONCLUSIONS

Based on a large German registry, using real-world data, OS with r-hFSH-alfa was associated with lower costs per live birth compared with hMG-HP

For up to three cumulative ART cycles, r-hFSH-alfa was found to be a cost-effective strategy compared with hMG-HP for ovarian stimulation

The robustness of the model data was confirmed in the sensitivity analyses

INTRODUCTION

- Appropriate selection of gonadotropin preparations for ovarian stimulation (OS) during ART treatment is based on:
  - **Overall benefit–risk evaluation**
  - **Cost-effectiveness**
  - **Patient preference**
- Cycles stimulated with reference follitropin alfa (r-hFSH-alfa, GONAL-f®, Merck Healthcare KGaA, Darmstadt, Germany) versus hMG-HP (Menogon® HP [Menopur®], Ferring Pharmaceuticals Ltd, Saint-Prex, Switzerland) had increased cumulative live birth rates and clinical and ongoing pregnancy rates in a large (>28,000 patients) real-world study[1]
- To complement RWE, cost-effectiveness analyses can support informed decision making regarding the optimal gonadotropin to be used for OS based on a comparison of all costs associated with ART cycles
- Thus, to the best of our knowledge, this is the first cost-effectiveness analysis comparing cumulative live birth (including fresh and freeze–thaw embryo transfers) for r-hFSH-alfa with hMG-HP in Germany using real-world data to provide a more accurate reflection of clinical practice

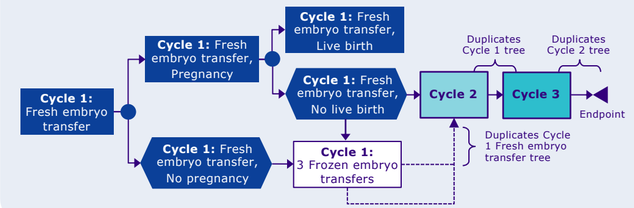
OBJECTIVES

To evaluate the real-world cumulative cost per live birth and cost-effectiveness of reference r-hFSH-alfa versus hMG-HP, for up to three cumulative ART cycles (maximum three stimulations and corresponding fresh and frozen embryo transfers)

METHODS

- Retrospective RWE analysis of the costs per live birth for r-hFSH-alfa versus hMG-HP, based on data from a German IVF registry (RecDate), including 71 German IVF centres (January 2007–December 2010)[1]
- A decision-tree model was developed (**Figure 1**), using pregnancy and live birth states for up to three complete ART cycles (defined as all embryos transferred [fresh or frozen] after a single stimulation cycle)[1] with the same gonadotropin from RecDate as clinical inputs
- Model outputs included total costs, live birth rates, costs per live birth, and ICER (difference in costs/difference in cumulative live birth between both treatments)
- Robustness of results to parameter input variation was assessed via sensitivity analyses

Figure 1. Model Structure



RESULTS

Table 1. Key Clinical and Cost-effectiveness Results (Cumulative)

	r-hFSH-alfa	hMG-HP	Difference
First complete ART cycle			
Live birth rate	25.3%	22.3%	3.0%
Cost per live birth	€17,938	€20,054	
ICER	€2,430		
Two complete ART cycles (cumulative)			
Live birth rate	30.9%	27.5%	3.5%
Cost per live birth	€18,251	€20,437	
ICER	€836		
Three complete ART cycles (cumulative)			
Live birth rate	31.9%	28.6%	3.4%
Cost per live birth	€18,473	€20,680	
ICER	Dominant		

- Treatment with r-hFSH-alfa resulted in higher adjusted cumulative live birth rates and lower costs per live birth versus hMG-HP (**Table 1**)
- Treatment with r-hFSH-alfa led to lower overall medication costs, as a lower dose was needed per live birth
- The ICER was €2,430 after the first ART cycle, €836 after the second ART cycle and becomes dominant after the third ART cycle (**Table 1**)
- The model results were most sensitive to the probability of live birth and pregnancy, compared with all clinical and cost inputs (**Figure 2**)
- The PSA for the third complete cumulative ART cycle shows that the majority of ICER data points were in the upper-right and lower-right quadrants of the cost-effectiveness plane, suggesting that results obtained from the analysis are robust and that treatment with r-hFSH-alfa can be considered cost-effective (**Figure 3**)

Figure 2. Tornado Diagram for OWSA for Live Birth

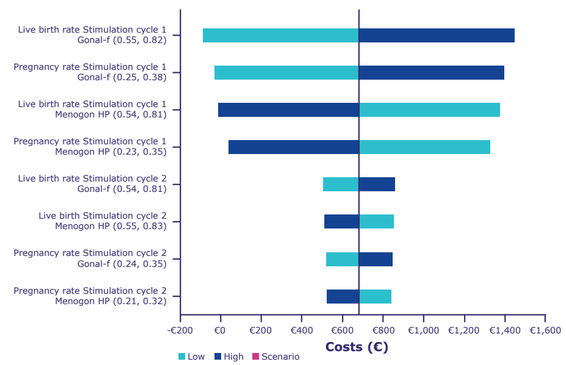
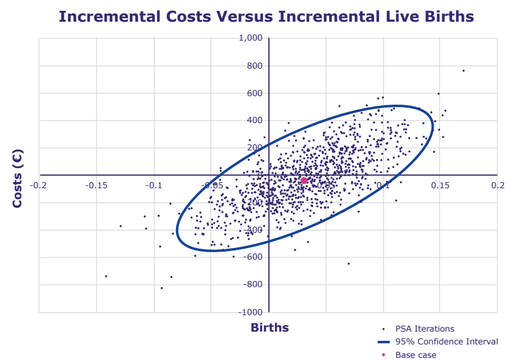


Figure 3. Cost-effectiveness Plane for the Third Complete ART Cycle (PSA)



*Affiliation at the time of the analysis.
ART, assisted reproductive technologies; **hMG-HP**, highly purified human menopausal gonadotropin; **ICER**, incremental cost-effectiveness ratio; **IVF**, in vitro fertilization; **OS**, ovarian stimulation; **OWSA**, one-way sensitivity analysis; **PSA**, probabilistic sensitivity analysis r-hFSH-alfa, recombinant human follicle-stimulating hormone alfa; **RWE**, real-world evidence.

REFERENCES
1.Bühler, et al. *Reprod Biol Endocrinol* 2021;19:90

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