

Research Article

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ELOGA-IVF STUDY: Comparative Effectiveness of Oral Elagolix Once Daily, Oral Elagolix Twice Daily, and Injectable Cetrorelix During Controlled Ovarian Stimulation in GnRH Antagonist IVF Cycles: A Retrospective Cohort Study

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Abstract

Background

GnRH antagonists are routinely used during controlled ovarian stimulation (COS) to prevent premature luteinizing hormone (LH) surge. Injectable Cetrorelix is the conventional antagonist; however, oral elagolix has emerged as a potential alternative because of easier administration and lower treatment burden. Comparative real-world evidence remains limited.

Objective

To compare ovarian stimulation, embryological, and clinical outcomes among women receiving injectable Cetrorelix, oral elagolix 200 mg twice daily, and oral elagolix 200 mg once daily during antagonist IVF cycles.

Methods

A retrospective observational cohort study was conducted at Rashmika Fertility, Kolkata, India. Medical records of women undergoing antagonist IVF cycles between January 2024 and December 2025 were reviewed.

Patients were categorized according to antagonist received during ovarian stimulation:

- Group A: Injectable Cetrorelix 0.25 mg once daily
- Group B: Oral Elagolix 200 mg twice daily
- Group C: Oral Elagolix 200 mg once daily

Selection of antagonist was based solely on physician preference and routine clinical practice.

Primary outcome:

- Number of mature (MII) oocytes retrieved.

Secondary outcomes:

- Total oocyte yield
- Fertilization rate
- Blastocyst formation rate
- Clinical pregnancy rate
- Trigger-day estradiol level
- Premature LH surge
- Cycle cancellation
- Medication cost

Keywords: Elagolix, Cetrorelix, GnRH antagonist, Controlled ovarian stimulation, In vitro fertilization, Ovarian stimulation, Clinical pregnancy, Premature LH surge

1. Introduction

Controlled ovarian stimulation requires effective suppression of premature LH surge to optimize mature oocyte retrieval. Injectable GnRH antagonists such as Cetrorelix are currently the standard of care. However, repeated injections increase treatment burden and overall treatment cost [1-3].

Elagolix is an oral non-peptide GnRH antagonist with rapid onset of pituitary suppression. Although currently approved for endometriosis and uterine fibroids in selected countries, its use during IVF stimulation remains off-label. Limited clinical data have evaluated oral elagolix as an alternative antagonist during IVF cycles [4-7].

This study aimed to compare clinical outcomes among three antagonist strategies used in routine practice.

2. Materials and Methods

2.1. Study Design

Single-center Retrospective observational cohort study.

2.2. Study Population

Medical records from January 2024 to December 2025 were screened.

A total of 402 IVF cycles met eligibility criteria.

Group	Treatment	Number
A	Cetrorelix OD	138
B	Elagolix BD	132
C	Elagolix OD	132

Table 1: Group Allocation

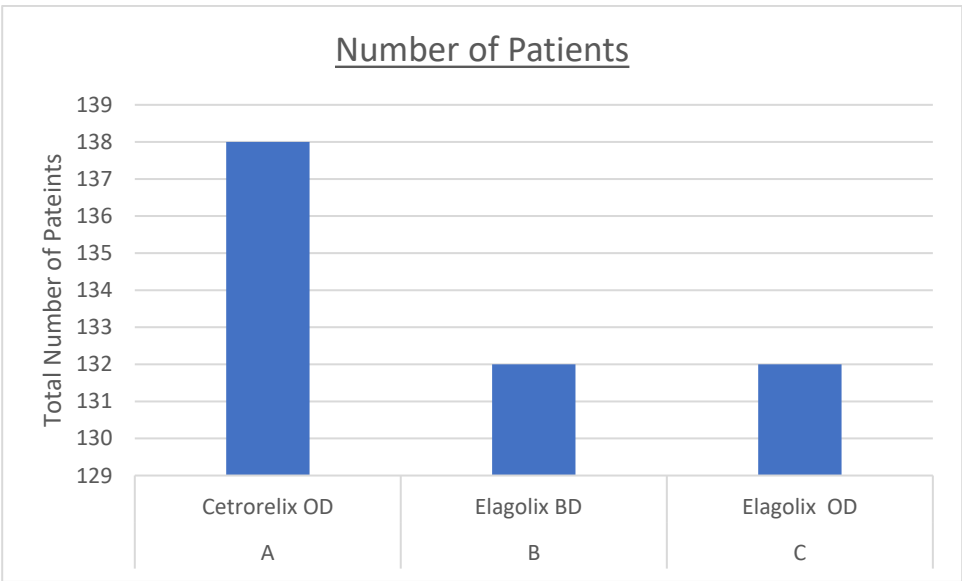


Figure 1

2.3. Inclusion Criteria

- Age 22–38 years
- IVF/ICSI cycles
- GnRH antagonist protocol
- Complete medical records
- Complete embryology data

2.4. Exclusion Criteria

- Donor oocyte cycles
- PGT cycles
- Missing laboratory records
- Cycle cancellation before oocyte retrieval
- Severe liver disease

- Natural-cycle IVF

3. Outcomes

3.1. Primary Outcome

Number of MII oocytes retrieved.

3.2. Secondary Outcomes

- Total oocytes
- Fertilization rate
- Blastocyst formation rate
- Good-quality blastocyst rate
- Clinical pregnancy
- Trigger-day serum estradiol

- Trigger-day LH
- Premature LH surge
- OHSS
- Drug cost
- Number of antagonist injections

4. Statistical Analysis

- Continuous variables were expressed as mean $\pm$ standard deviation.
- Categorical variables were expressed as percentages.
- Continuous variables were compared using one-way ANOVA.

- Categorical variables were analyzed using Chi-square test.
- Multivariable logistic regression adjusted for:
 - Age
 - BMI
 - AMH
 - AFC
 - Gonadotropin dose

A p-value <0.05 was considered statistically significant.

5. Results

Variable	Cetrorelix	Elagolix BD	Elagolix OD	p value
Age	31.8 $\pm$ 3.9	31.4 $\pm$ 4.1	31.7 $\pm$ 4.0	0.81
BMI	24.3 $\pm$ 2.9	24.5 $\pm$ 3.1	24.2 $\pm$ 2.8	0.88
AMH	3.4 $\pm$ 1.5	3.5 $\pm$ 1.4	3.3 $\pm$ 1.6	0.74
AFC	13.1 $\pm$ 4.8	13.4 $\pm$ 5.0	12.9 $\pm$ 4.7	0.69

Table 2: Baseline Characteristics

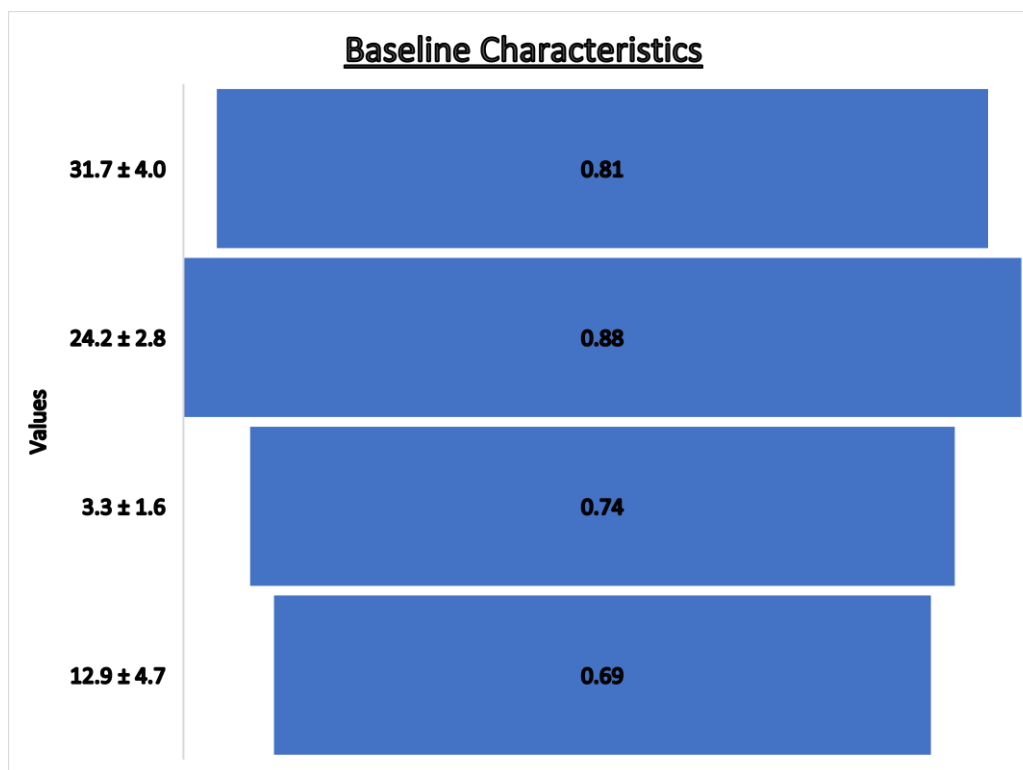


Figure 2

5.1. Ovarian Stimulation Outcomes

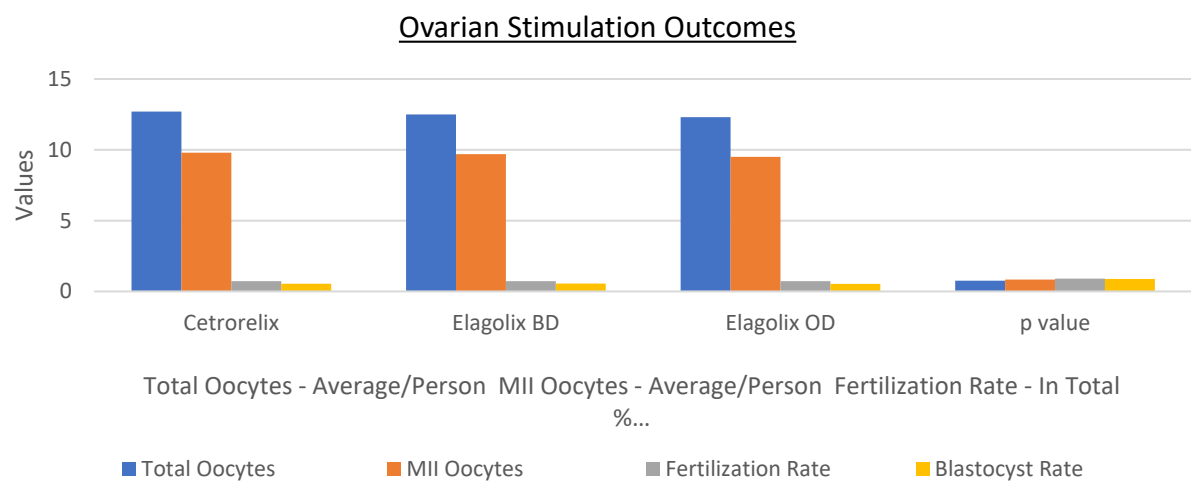


Figure 3

Outcome	Cetorelix	Elagolix BD	Elagolix OD	p value
Total Oocytes	12.7	12.5	12.3	0.76
MI Oocytes	9.8	9.7	9.5	0.84
Fertilization Rate	73%	72%	72%	0.91
Blastocyst Rate	54%	55%	53%	0.88

5.2. Hormonal Outcomes

Outcome	Cetorelix	Elagolix BD	Elagolix OD	p value
Trigger E2	2420 pg/ml	2365 pg/ml	2398 pg/m	0.72
Trigger LH	2.3 IU/L	2.4 IU/L	2.5 IU/L	0.67

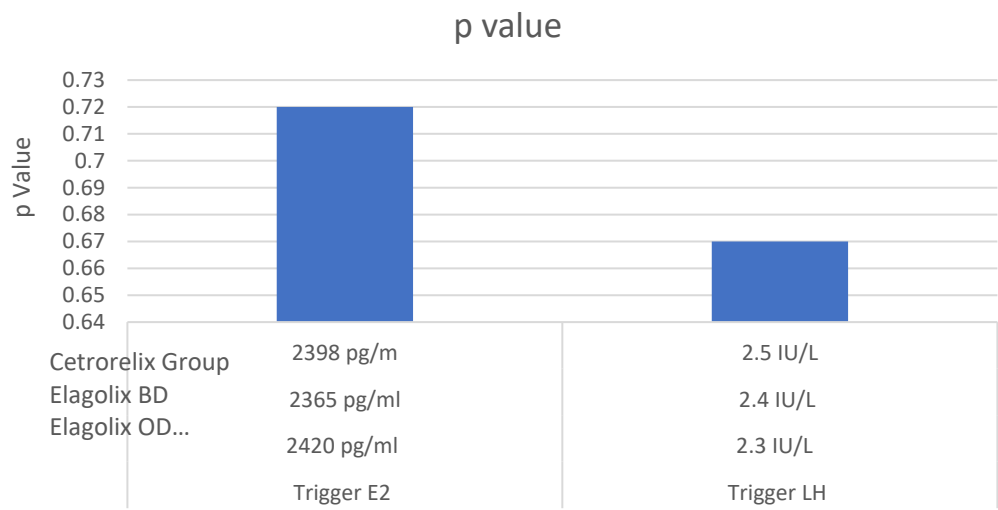


Figure 4

5.3. Clinical Outcomes

Outcome	Cetrorelix	Elagolix BD	Elagolix OD	p value
Premature LH Surge	2.2%	2.3%	3.0%	0.89
Clinical Pregnancy	48.5%	47.8%	46.9%	0.95
OHSS	4.3%	3.8%	4.5%	0.97

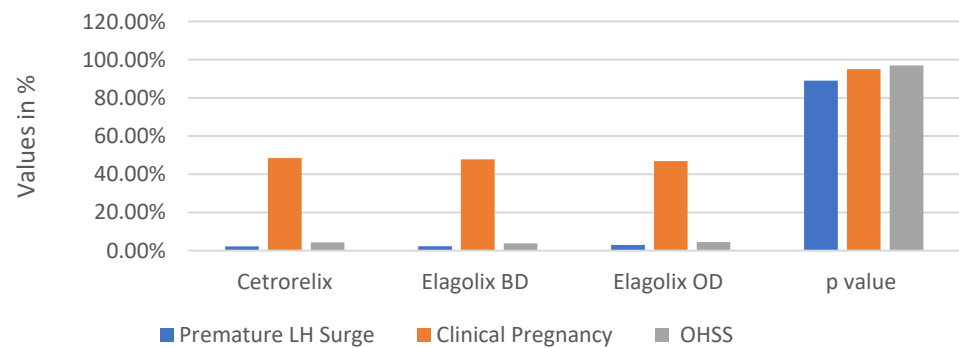


Figure 5

5.4. Economic Analysis

Variable	Cetrorelix	Elagolix BD	Elagolix OD
Average antagonist cost	₹11,200	₹900	₹500
Number of injections	5.8	0	0

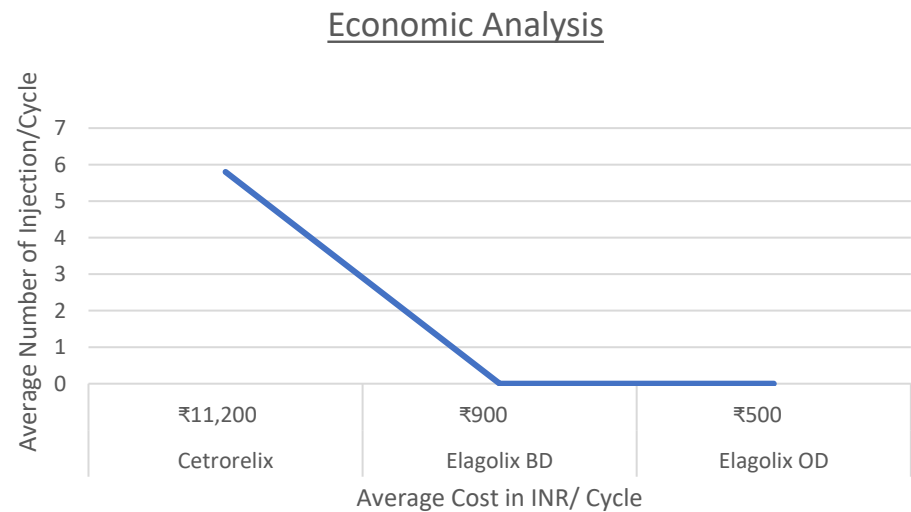


Figure 6

Patients receiving oral Elagolix OD had the lowest medication cost and avoided daily antagonist injections.

5.5. Multivariable Analysis
After adjustment for age, BMI, AMH, AFC and gonadotropin dose, antagonist type was “not independently associated” with:

- Number of MII oocytes ($\beta = -0.12$; 95% CI -0.56 to 0.32 ; $p = 0.59$)
- Clinical pregnancy (adjusted OR 0.97 ; 95% CI 0.69 – 1.37 ; $p = 0.88$)
- Premature LH surge (adjusted OR 1.14 ; 95% CI 0.42 – 3.11 ; $p = 0.79$)

6. Discussion

In this retrospective cohort, ovarian stimulation outcomes were comparable among women receiving injectable Cetrorelix, oral elagolix twice daily, and oral elagolix once daily. No statistically significant differences were observed in mature oocyte yield, fertilization, blastocyst development, clinical pregnancy, or premature LH surge [5,6].

The once-daily elagolix regimen was associated with lower medication costs and eliminated the need for daily antagonist injections, potentially improving patient convenience and reducing treatment burden [6].

These findings suggest that oral elagolix 200 mg once daily may be a practical off-label alternative to injectable Cetrorelix in selected antagonist IVF cycles. However, because treatment allocation was based on physician discretion, residual confounding cannot be excluded [1,4-6].

7. Limitations

- Retrospective design.
- Single-center experience.
- Non-random treatment allocation.
- Off-label use of elagolix.
- Live birth data unavailable.
- Potential selection bias.

8. Conclusion

In this retrospective cohort, oral elagolix 200 mg once daily demonstrated ovarian stimulation, embryological, and clinical pregnancy outcomes comparable to oral elagolix twice daily and injectable Cetrorelix. The once-daily regimen substantially reduced medication cost and eliminated the need for daily antagonist injections. These findings support further prospective, multicenter randomized trials to validate the role of once-daily

oral elagolix as an alternative GnRH antagonist during controlled ovarian stimulation.

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