Role of tab Eggtor to improve poor ovarian reserve in females with infertility

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Abstract

Introduction: Infertility is a condition where a woman cannot conceive after unprotected sexual intercourse or therapeutic donor insemination for 12 months or six months for women under 35 years old or over 35 years old. It affects around 15% of marriages and is primarily caused by ovulatory disorders, endometriosis, pelvic adhesions, tubal blockage, and hyperprolactinemia. Treatments include melatonin, CoQ10, carnitine, selenium, vitamin D, myo-inositol, omega-3, Chinese herbs, and dietary interventions. Supplements like alpha lipoic acid and leucine are being explored as potential treatments for poor ovarian reserve, potentially reducing oxidative stress, improving mitochondrial function, regulating insulin sensitivity, and providing antioxidant benefits.

Materials and Methods: A study at the In Vitro Fertilization Center at Muzaffarnagar Medical College assessed the efficacy of Tab Eggtor, a proprietary supplement, in enhancing ovarian reserve and fertility in women with diminished ovarian function. The study involved 100 patients aged 25-35 who met inclusion criteria. Follow-up was performed after three months of daily Tab Eggtor administration.

Results: The study revealed significant increases in ovarian follicular counts and anti-Müllerian hormone levels between baseline and follow-up. The right ovary follicular count increased from 2.1 to 6.4 (p<0.00001), while the left ovary follicular count rose from 1.8 to 6.7. (p<0.00001) These findings suggest a significant development in ovarian follicle maturation over the observation period. The increase in Anti-Müllerian hormone levels (p=0.00091) suggested improved ovarian reserve and potential fertility.

Conclusion: The research demonstrated significant enhancements in ovarian follicular counts and Anti-Müllerian hormone levels, indicating improved ovarian function and fertility.

Keywords: Eggtor, follicular count, anti-müllerian hormone, fertility, ovarian reserve

Introduction

Infertility is a condition where a woman cannot conceive after unprotected sexual intercourse or therapeutic donor insemination for 12 months or six months for women under 35 years old or over 35 years old [1]. Female infertility is primarily caused by ovulatory abnormalities (25%), endometriosis (15%), pelvic adhesions (12%), tubal blockage (11%), and other tubal/uterine abnormalities (11%). Ovulatory abnormalities interfere with the regular discharge of eggs from the ovaries, while endometriosis causes inflammation and scarring. Pelvic adhesions distort anatomical structures, while tubal blockage impedes egg movement via fallopian tubes, preventing fertilization. Other tubal/uterine abnormalities, such as structural deformities or growths, may hinder implantation or transportation. Hyperprolactinemia, 7%, interferes with ovulation and reduces fertility. Understanding these factors is crucial for developing practical diagnostic and therapeutic approaches to tackle female infertility [2]. These factors may lead to a poor ovarian reserve, which does not produce enough good-quality eggs in response to ovarian stimulation during assisted reproductive techniques (ART). The use of antioxidants, vitamins, or hormones before and during controlled ovarian stimulation (COS) has been suggested to enhance the follicular microenvironment and, thus, increase the quality of oocytes. [3] Treatments include DHEA, melatonin, CoQ10, carnitine, selenium, vitamin D, myo-inositol, omega-3, Chinese herbs, and dietary interventions [4]. Supplements like alpha lipoic acid and leucine are being explored as potential treatments for poor ovarian reserve, potentially reducing oxidative stress, improving mitochondrial function, regulating insulin sensitivity, and providing antioxidant benefits. Furthermore, the place of Tab. Eggtor supplementation has yet to be clarified, which may lead to improvements in clinical and embryological IVF outcomes.
Materials and Methods

A comprehensive, prospective comparative study was conducted at the IVF center at Muzaffarnagar Medical College in Muzaffarnagar, Uttar Pradesh from November 2022 to May 2023. The study included 100 patients who met specific inclusion and exclusion criteria. The primary objective of this study is to evaluate the efficacy of Tab Eggtor, a proprietary supplement, in improving the ovarian reserve and fertility outcomes of women experiencing infertility due to diminished ovarian function. The study seeks to determine if Tab Eggtor can be a potential treatment for this challenging problem. The study was conducted with the utmost care, and all ethical considerations were taken into account to ensure the safety and well-being of the patients. The study included women aged 25 to 35 years diagnosed with poor ovarian reserve, defined by meeting at least two criteria such as AMH levels below 1.0 ng/mL, antral follicle count less than 5-7, elevated FSH above 10 mIU/mL, or previous poor ovarian response with fewer than four eggs retrieved. Participants have regular menstrual cycles between 21 and 35 days, a body mass index of 18.5–30 kg/m², and a willingness to comply with study procedures. However, the study excluded women with known infertility causes other than ovarian reserve, previous ovarian surgery or pelvic radiation, untreated endocrine disorders, severe medical conditions, recent hormonal contraceptive or fertility medication use, smoking or excessive alcohol intake, and allergies to Tab Eggtor components.

Following approval from the Institutional Ethics Committee (IEC) and the acquisition of written informed consent, we selected 100 infertility subjects with poor ovarian reserve based on inclusion and exclusion criteria. A detailed history was taken, including information regarding comorbidities, allergies, and past hospital admissions. General physical examination and systemic examination were performed. Patients underwent clinical assessment and biochemical investigations, including serum AMH levels. A transvaginal sonography was performed to determine the number of follicles. For three months, all the subjects received treatment with Tab. Eggtor once a day. The study investigated serum AMH levels and follicle count at baseline and three months of follow-up. Statistical analysis was done using a paired t-test.

Results

The mean age of the study participants is 29.5 years on average, with a standard deviation of 4.78 years the mean number of ovarian follicles in the right ovary at baseline and during a follow-up period. The baseline mean follicular count was 2.10 with a standard deviation of 1.37, while the follow-up mean was notably higher at 6.40 with a standard deviation 1.43. The t-test analysis yielded a t-value of 14.33 and an extremely small p-value of less than 0.00001. This p-value indicates a statistically significant difference between the baseline and follow-up means for the right ovary, suggesting a substantial increase in the average number of follicles observed during the follow-up period compared to the initial baseline measurements. The reasonably large t-value of 12.04 further supports the significance of this observed change in left ovarian follicular count between the two-time points evaluated.

Comparison of baseline and follow-up measurements of Anti-Müllerian Hormone (AMH), a marker associated with ovarian reserve and fertility in females. The mean AMH level at baseline was 0.57 with a standard deviation of 0.26, while at follow-up, the mean increased substantially to 3.21 with a standard deviation of 1.73. The calculated t-value of 4.85 suggests a significant difference between the two sets of measurements. This inference is supported by the remarkably small p-value of 0.00091, indicating strong evidence against the null hypothesis of no difference between baseline and follow-up AMH levels.

The baseline and follow-up measurements for several ovarian functions and fertility variables. The baseline count for the right ovary follicular count was 2.1, which increased to 6.4 at follow-up. Similarly, the baseline count of the left ovary follicular count was 1.8, which rose to 6.7 at follow-up. These increases in follicular counts suggest a significant development in ovarian follicle maturation over the observation period. The anti-Müllerian hormone (AMH) levels also exhibited a notable increase from a baseline value of 0.57 to 3.209 at follow-up. This increase in AMH levels is consistent with the observed increase in follicular counts, which may indicate improved ovarian reserve and potential fertility. These findings suggest positive ovarian function and reproductive health changes between baseline and follow-up assessments. (As shown in Figure 1).

Discussion

The research involved the examination of 100 women who were experiencing infertility issues due to poor ovarian reserve. Before conducting the study, the Institutional Ethics Committee approved it to ensure ethical practices and procedures. Each woman underwent a thorough evaluation, including a detailed medical history, physical examination, and biochemical investigations, including serum AMH levels. Transvaginal sonography was also utilized to determine follicle count. All participants received daily treatment with Tab. Eggtor for three months. The study analyzed the serum AMH levels and follicle count at baseline and three months of follow-up using a paired t-test. The Tab Eggtor contains alpha lipoic acid 200 mg and leucine 800 mg. Poor ovarian response (POR) is a condition when a woman’s ovaries fail to generate an adequate number of high-quality eggs in response to ovarian stimulation during assisted reproductive methods (ART). Alpha-lipoic acid is a powerful antioxidant that scavenges free radicals and reduces oxidative stress. Oxidative stress has been implicated in ovarian aging and diminished ovarian reserve. [5] ALA improves mitochondrial function, which is crucial for energy production in ovarian cells, potentially reducing age-related decline in ovarian function and promoting follicular development. [6] Leucine is an essential amino acid that is vital in creating proteins. It is also recognized for stimulating the mTOR pathway, which regulates cell growth, multiplication, and survival. [7] A prospective study by Masharani et al. (2010) [8] looked at what happened when six
thin, non-diabetic women with PCOS took 600 mg of controlled-release alpha-lipoic acid (CRLA) twice a day. The women were 26.8±3.8 years old. The intervention increased menstrual frequency, with the participants experiencing 3–4 menstrual cycles during the 16 weeks. Rago et al. (2015) conducted a study in Italy with 37 lean women (mean age 37.1±2.7 years) who received a combination of 800 mg/day alpha-lipoic acid (ALA) and 2 g/day myo-inositol. The results showed decreased insulin levels, reduced BMI, and improved oocyte quality. Cianci et al. (2015) investigated the effects of 600 mg/day ALA and 1 g/day D-chiro-inositol (DCI) in 46 women with a mean age of 23.8±2.5 years, leading to increased menstrual frequency. Fruzzetti et al. (2019) studied 41 women (mean age 21±4.7 years) who received 600 mg/day ALA and 1 g/day DCI, also resulting in increased menstrual frequency. Another study by Fruzzetti et al. (2020) involved 44 women (mean age 23.1±5.4 years) who were given 800 mg/day ALA and 2 g/day myo-inositol. The intervention led to decreased BMI and increased menstrual frequency. Canosa et al. (2020) conducted a study in Italy with 40 overweight or obese women divided into two groups with mean ages of 35±5.5 and 37.2±3.3 years. The participants received 800 mg/day ALA and 2 g/day myo-inositol (MYO), improving oocyte quality. In the current study (2023), 100 participants, ranging in age from 29.5 to 4.78 years, received a supplement named "Tab. Eggtor" that contained 200 mg ALA and 800 mg leucine. The results showed an increased follicular count and improved oocyte quality. These studies show that alpha-lipoic acid may be suitable for your reproductive health, either by itself or when mixed with other chemicals like Myo-inositol, D-chiro-inositol, and leucine. It may help with menstrual cycles, insulin sensitivity, body mass index (BMI), oocyte quality, and follicular development.

![Fig 1: Cluster bar chart for baseline and follow-up measurements of follicular count and AMH levels](image)

<table>
<thead>
<tr>
<th>Author</th>
<th>Study year</th>
<th>Sample size</th>
<th>Mean age (years)</th>
<th>Intervention</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masharani et al. [8]</td>
<td>2010</td>
<td>06</td>
<td>26.8±3.8</td>
<td>600 mg of controlled-release alpha-lipoic acid (CRLA) twice daily</td>
<td>Menstrual cycles (n.) in 16 weeks 3–4</td>
</tr>
<tr>
<td>Rago et al. [9]</td>
<td>2015</td>
<td>37</td>
<td>37.1±2.7</td>
<td>ALA 800 mg/day + Myo-Ins 2 g/day</td>
<td>↓ insulin levels ↓ BMI ↑ oocyte quality</td>
</tr>
<tr>
<td>Cianci et al. [10]</td>
<td>2015</td>
<td>46</td>
<td>23.8±2.5</td>
<td>ALA 600 mg/day + DCI 1 g/day</td>
<td>↑ menstrual frequency</td>
</tr>
<tr>
<td>Fruzzetti et al. [11]</td>
<td>2019</td>
<td>41</td>
<td>21±4.7</td>
<td>ALA 600 mg/day + DCI 1 g/day</td>
<td>↑ menstrual frequency</td>
</tr>
<tr>
<td>Fruzzetti et al [12]</td>
<td>2020</td>
<td>44</td>
<td>23.1±5.4</td>
<td>ALA 800 mg/day + Myo-Ins 2 g/day</td>
<td>↓ BMI</td>
</tr>
<tr>
<td>Canosa et al. [13]</td>
<td>2020</td>
<td>40 (20 and 20)</td>
<td>35±5.5, 37.2±3.3</td>
<td>ALA 800 mg/day + MYO 2 g/day</td>
<td>↑ oocyte quality</td>
</tr>
<tr>
<td>Present study</td>
<td>2023</td>
<td>100</td>
<td>29.5±4.78</td>
<td>Tab. Eggtor, ALA 200 mg, Leucine 800mg</td>
<td>Increased follicular count and oocyte quality</td>
</tr>
</tbody>
</table>

**Conclusion**

The study found significant improvements in ovarian function and fertility variables over the observation period, with increased follicular counts and Anti-Müllerian Hormone levels. These findings suggest enhanced ovarian reserve and potential fertility, with strong statistical significance in t-tests.

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**Conflicts of Interest:** None

**References**

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