International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622

www.gynaecologyjournal.com
2024; 8(4): 120-123
Received: 17-05-2024
Accepted: 21-06-2024

Dr. Bharti Maheshwari
Professor, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India.

Dr. Deepika Paliwal
Post Graduate, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India

Dr. Anita Mathew
Post Graduate, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India.

Dr. Yalamanchili Sravanthi
Post Graduate, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India.
Email:

Corresponding Author:
Dr. Bharti Maheshwari
Professor, Muzaffarnagar Medical College, Muzaffarnagar, Uttar Pradesh, India

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

Dr. Bharti Maheshwari, Dr. Deepika Paliwal, Dr. Anita Mathew and Dr. Yalamanchili Sravanthi

DOI: https://doi.org/10.33545/gynae.2024.v8.i4b.1482

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 enhanced 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 minuscule p-value indicates a statistically significant difference between the baseline and follow-up means, suggesting a substantial increase in the average number of follicles observed in the right ovary during the follow-up period compared to the initial baseline measurements. The large t-value further reinforces the significance of this observed change in follicular count between the two-time points.

Similar to the right ovary, compare the mean number of ovarian follicles in the left ovary at baseline and during a follow-up period. The baseline mean follicular count for the left ovary was 1.80, with a standard deviation of 1.17, while the follow-up mean was markedly higher at 6.70, with a standard deviation of 1.95. The t-test analysis yielded a t-value of 12.04 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 left 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. Therefore, the data strongly suggests a significant increase in AMH levels from baseline to follow-up, which may affect the studied population's ovarian function and fertility status.

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) [3] 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.

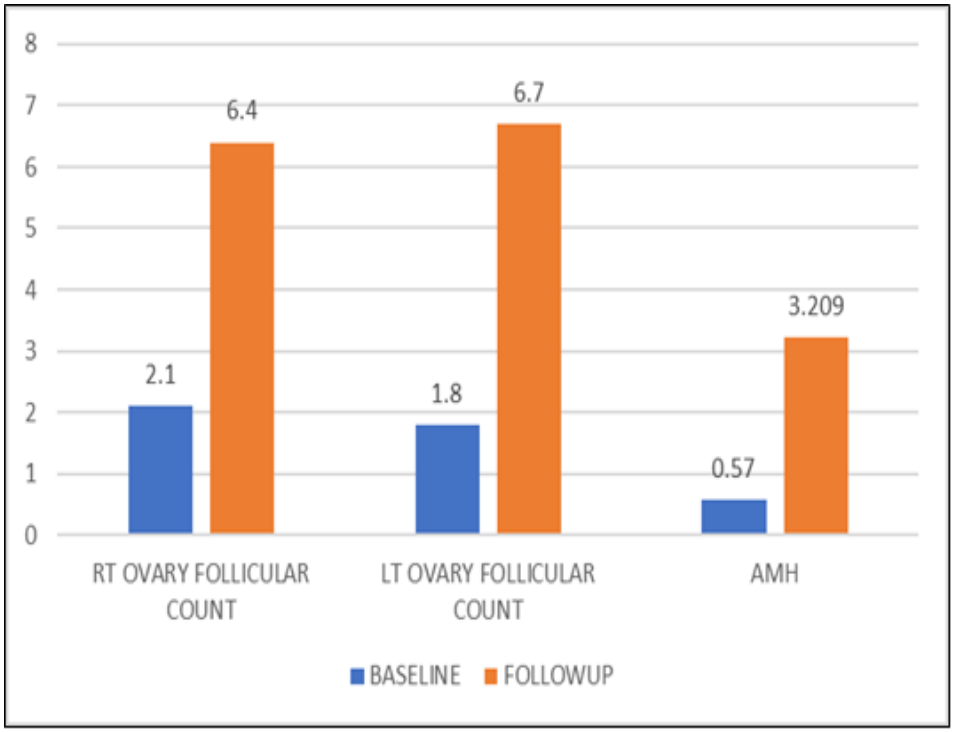

Fig 1: Cluster bar chart for baseline and follow-up measurements of follicular count and AMH levels

Table 1: Characteristics of the included studies

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

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.

Acknowledgements: None

Conflicts of Interest: None

References

1. ACOG. Infertility Workup for the Women's Health

Specialist [Internet]. www.acog.org. 2019. Available from: https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2019/06/infertility-workup-for-the-womens-health-specialist
2. Walker MH, Tobler KJ. Female Infertility [Internet]. PubMed. Treasure Island (FL): StatPearls Publishing; 2022. Available from: https://www.ncbi.nlm.nih.gov/books/NBK556033/
3. Canosa S, Paschero C, Carosso A, Leoncini S, Mercaldo N, Gennarelli G, *et al*. Effect of a Combination of Myo-Inositol, Alpha-Lipoic Acid, and Folic Acid on Oocyte Morphology and Embryo Morphokinetics in non-PCOS Overweight/Obese Patients Undergoing IVF: A Pilot, Prospective, Randomized Study. Journal of Clinical Medicine. 2020 Sep 12;9(9):2949.
4. Hart RJ. Nutritional supplements and IVF: an evidence-based approach. RBMO. 2024 Mar;48(3):103770.
5. Yang L, Chen Y, Liu Y, Xing Y, Miao C, Zhao Y, *et al*. The Role of Oxidative Stress and Natural Antioxidants in Ovarian Aging. Frontiers in Pharmacology. 2021 Jan 14;11:617843.
6. Chiang JL, Shukla P, Pagidas K, Ahmed NS, Karri S, Gunn DD, *et al*. Mitochondria in Ovarian Aging and Reproductive Longevity. Ageing Res Rev. 2020 Nov;63:101168.
7. Stalin C. Leucine Supplementation in ART: Improving Ovarian Response in Poor Responders. Journal of community medicine and public health reports. 2024 Jan 20;5(2).
8. Masharani U, Gjerde C, Evans JL, Youngren JF, Goldfine ID. Effects of controlled-release alpha lipoic acid in lean, nondiabetic patients with polycystic ovary syndrome. J Diabetes Sci Technol. 2010 Mar 1;4(2):359-64.
9. Rago R, Marcucci I, Leto G, Caponecchia L, Salacone P, Bonanni P, *et al*. Effect of myo-inositol and alpha-lipoic acid on oocyte quality in polycystic ovary syndrome non-obese women undergoing in vitro fertilization: a pilot study. J Biol Regul Homeost Agents. 2015;29(4):913-23.
10. Cianci A, Panella M, Fichera M, Falduzzi C, Bartolo M, Caruso S. D-chiro-Inositol and alpha lipoic acid treatment of metabolic and menses disorders in women with PCOS. Gynecol Endocrinol. 2015 Jun;31(6):483-6.
11. Fruzzetti F, Capozzi A, Canu A, Lello S. Treatment with d-chiro-inositol and alpha lipoic acid in the management of polycystic ovary syndrome. Gynecol Endocrinol. 2019 Jun;35(6):506-10.
12. Fruzzetti F, Fidecicchi T, Palla G, Gambacciani M. Long-term treatment with α-lipoic acid and myo-inositol positively affects clinical and metabolic features of polycystic ovary syndrome. Gynecol Endocrinol. 2020 Feb;36(2):152-5

How to Cite This Article
Maheshwari B, Mathew A, Sravanthi Y. Role of tab Eggtor to improve poor ovarian reserve in females with infertility. International Journal of Clinical Obstetrics and Gynaecology. 2024;8(4):120-123