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Marked Recovery of Total Testosterone from 150 to 530 ng/dL Over 86 Days during Predominantly OMAD Fasting, Weight Reduction and Approximately Six Weeks of Trigonelline Supplementation

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Abstract

Background: Reduced testosterone concentrations are frequently observed in men with severe obesity and metabolic dysfunction. Testosterone physiology may be influenced by body composition, insulin sensitivity, adipose-tissue endocrine activity and other metabolic factors. Trigonelline, a naturally occurring pyridine alkaloid found in fenugreek, has also attracted interest because of its metabolic and cellular effects.

Case Presentation: A 54-year-old male with severe obesity had reportedly been receiving GLP-1 receptor agonist therapy for approximately three years. Hormonal assessment performed on 17 May 2026 demonstrated a total testosterone concentration of 150 ng/dL and free testosterone of 3.53 pg/mL.

Following this assessment, the patient discontinued GLP-1 receptor agonist therapy and maintained a predominantly one-meal-a-day (OMAD) dietary pattern for the subsequent 86 days.

The patient consumed one meal on the majority of days. Two meals were taken only rarely, approximately twice per month. On approximately two occasions per week, the eating window was extended to approximately 3–4 hours.

Trigonelline supplementation was administered for approximately 1½ months during the observation period. Body weight decreased from approximately 130 kg to 123 kg.

At follow-up, total testosterone had increased to 530 ng/dL, within the laboratory reference interval of 280–800 ng/dL.

Conclusion: Total testosterone increased from 150 ng/dL to 530 ng/dL over 86 days, representing an absolute increase of 380 ng/dL and an approximately 3.5-fold increase. The increase occurred during predominantly OMAD fasting, approximately 7 kg of weight reduction and approximately six weeks of trigonelline supplementation.

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1. Introduction

Testosterone is the principal circulating androgen in adult males and has important roles in reproductive function, sexual health, body composition, muscle maintenance and bone physiology.

Low testosterone concentrations are commonly associated with severe obesity and metabolic dysfunction.

Obesity-related androgen disturbances can involve alterations in hypothalamic–pituitary–gonadal axis signaling, insulin sensitivity, adipose-tissue endocrine activity, systemic inflammation and peripheral sex-hormone metabolism.

Adipose tissue also participates in androgen metabolism through aromatase activity, which converts testosterone to estradiol. Consequently, substantial changes in body composition and metabolic function can influence the circulating androgen environment.

Trigonelline is a naturally occurring pyridine alkaloid present in fenugreek (Trigonella foenum-graecum) and other plant sources. Its reported metabolic and cellular effects make it of interest in the context of metabolic health and potentially androgen physiology.

The present case documents a substantial increase in total testosterone from 150 ng/dL to 530 ng/dL over 86 days during a period of predominantly OMAD fasting, weight reduction and approximately six weeks of trigonelline supplementation.

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2. Case Presentation

The patient was a 54-year-old male with severe obesity who had reportedly been receiving GLP-1 receptor agonist therapy for approximately three years.

The baseline hormonal assessment was performed on 17 May 2026 at 09:58 AM.

At that assessment:

- Total testosterone: 150 ng/dL
- Free testosterone: 3.53 pg/mL

The patient subsequently discontinued the GLP-1 receptor agonist and maintained a predominantly one-meal-a-day dietary pattern throughout the observation period.

The patient consumed one meal on the majority of days. Two-meal days occurred only rarely, approximately twice per month. On approximately two occasions per week, the eating window was extended to approximately 3–4 hours.

The total observation period between testosterone assessments was 86 days.

3. Trigonelline Supplementation and Weight Reduction

Trigonelline supplementation was administered for approximately 1½ months within the 86-day observation period.

The testosterone measurements were separated by 86 days, whereas the period of trigonelline supplementation was approximately six weeks.

The dosage consumed was 500mg of fenugreek seed extract with 50% of Trigonelline.

During the same overall period, body weight decreased from approximately 130 kg to 123 kg, representing an approximate 7 kg reduction.

4. Baseline Testosterone Status

The initial testosterone assessment demonstrated a substantially reduced total testosterone concentration of 150 ng/dL.

Free testosterone was also low at 3.53 pg/mL.

This assessment provided the biochemical baseline for evaluating the subsequent change in androgen status.

5. Testosterone Response

Repeat testing after the 86-day observation period demonstrated a total testosterone concentration of:

530 ng/dL

The laboratory reference interval was 280–800 ng/dL.

Testosterone Comparison

Parameter	Baseline	Follow-up
Total testosterone	150 ng/dL	530 ng/dL
Absolute change	—	+380 ng/dL
Percentage increase	—	~253%
Fold increase	—	~3.5-fold
Interval between assessments	—	86 days

The total testosterone concentration therefore increased from 150 ng/dL to 530 ng/dL, moving from a markedly low concentration into the laboratory reference range.

This represents the central finding of the case.

6. Fasting Pattern

The dietary intervention was predominantly OMAD.

Throughout the 86-day period, the patient followed a one-meal pattern on the majority of days.

The deviations were limited:

- Approximately two two-meal days per month
- Approximately two occasions per week with an extended 3–4-hour eating window

Thus, the intervention represented sustained daily fasting with a consistently restricted eating window.

7. Weight Reduction

Body weight decreased from approximately 130 kg to 123 kg during the observation period.

This approximately 7 kg reduction occurred concurrently with the dietary intervention and the testosterone recovery.

Weight reduction is relevant to androgen physiology because severe adiposity can influence insulin signaling, inflammatory pathways, aromatase activity and sex-hormone metabolism.

8. Potential Biological Relevance of Trigonelline

Trigonelline is a pyridine alkaloid naturally present in fenugreek and other plant sources.

Its biological effects have been studied primarily in relation to metabolic regulation and cellular physiology. Of particular relevance to steroidogenesis are potential effects involving:

- cellular energy metabolism;
- mitochondrial function;
- oxidative balance; and

- metabolic signaling.

Testosterone synthesis takes place primarily in Leydig cells, where steroidogenesis requires coordinated endocrine signaling, cholesterol transport, mitochondrial activity and steroidogenic enzyme function.

The initial stage of steroidogenesis involves mitochondrial cholesterol transport and conversion of cholesterol toward pregnenolone, followed by subsequent enzymatic reactions leading to testosterone.

Consequently, metabolic and mitochondrial cellular conditions can influence the capacity of Leydig cells to maintain steroidogenesis.

Within this framework, trigonelline is biologically relevant as a compound that may influence the cellular metabolic environment associated with steroidogenic activity.

9. Metabolic Changes Observed During the Intervention

The period of testosterone recovery was accompanied by broader metabolic improvements.

During the 86-day observation period, the patient experienced approximately 7 kg of weight reduction, from approximately 130 kg to 123 kg. This occurred in the context of sustained predominantly OMAD fasting, with only occasional extension of the eating window or transition to two meals.

Biochemical assessment during the same period demonstrated a significant reduction in fasting insulin levels and a marked reduction in hs-CRP, indicating improvement in insulin-related metabolic status and systemic inflammatory burden.

Other measured metabolic parameters also showed an overall favorable trend during the observation period.

Summary of Metabolic Changes

Parameter	Observation during the 86-day period
Body weight	~130 → 123 kg
Fasting insulin	Significant reduction
hs-CRP	Marked reduction
Other measured metabolic parameters	Overall favorable trend
Fasting pattern	Predominantly OMAD
Trigonelline supplementation	~1½ months

These metabolic changes provide important physiological context for the subsequent increase in testosterone from 150 ng/dL to 530 ng/dL.

10. Biological Interpretation

The observed testosterone recovery occurred within this broader period of metabolic improvement.

Weight reduction and improved metabolic physiology can potentially influence obesity-associated androgen dysfunction through changes in:

- insulin sensitivity;

- adipose-tissue endocrine signaling;
- systemic inflammatory activity;
- peripheral sex-hormone metabolism; and
- hypothalamic–pituitary–gonadal axis function.

Trigonelline is of particular interest because its metabolic and cellular effects could potentially influence the physiological environment required for steroidogenesis.

The approximately six-week period of trigonelline supplementation occurred within the overall period during which testosterone increased substantially.

11. Discussion

The principal finding was a rise in total testosterone from 150 ng/dL to 530 ng/dL within 86 days.

The increase of 380 ng/dL corresponds to an approximately 253% increase, or approximately 3.5 times the baseline concentration.

This occurred while the patient maintained predominantly OMAD fasting and experienced approximately 7 kg of weight reduction. Trigonelline supplementation was administered for approximately six weeks during this period.

The magnitude and relatively short time course of the testosterone recovery are clinically notable.

The improvement occurred alongside evidence of broader metabolic improvement, including a significant reduction in fasting insulin and a marked reduction in hs-CRP.

From a physiological perspective, improvement in metabolic health and reduction in adiposity can favor restoration of androgen physiology in men with obesity-associated testosterone deficiency.

Trigonelline represents an additional component of interest because of its biological effects on metabolic and cellular processes potentially relevant to steroidogenic function.

12. Conclusion

This case demonstrates a marked increase in total testosterone from 150 ng/dL to 530 ng/dL over 86 days.

The testosterone recovery occurred during:

- predominantly OMAD fasting;
- approximately 7 kg of weight reduction; and
- approximately six weeks of trigonelline supplementation.

The patient's metabolic profile also improved during this period, including a significant reduction in fasting insulin and a marked reduction in hs-CRP.

The increase from 150 to 530 ng/dL represents an approximately 3.5-fold increase in total testosterone within 86 days.

The biological relevance of trigonelline in this case is supported by its potential relationship with metabolic, mitochondrial and cellular processes involved in steroidogenic physiology.

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