

Post-Operative Analgesic Requirement in Hypothyroid Patients Undergoing Laparoscopic Bariatric Surgery

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Abstract

Introduction: Hypothyroidism is a common endocrine disorder with reduced thyroid hormone secretion. Patients with hypothyroidism may require increased doses of anesthesia and analgesia due to altered metabolism and reduced drug clearance. Laparoscopic bariatric surgery is a standard procedure for weight loss in morbidly obese patients. Post-operative pain management in these patients is important for effective recovery and reduced morbidity.

Aim and Objectives: To assess the post-operative analgesic requirement in hypothyroid patients undergoing laparoscopic bariatric surgery.

Materials and Methods: This was a prospective study of hypothyroid patients who underwent laparoscopic bariatric surgery between January 2015 and December 2020 at a tertiary care hospital. Patients were included if they had a confirmed diagnosis of hypothyroidism, were undergoing laparoscopic bariatric surgery, and received post-operative analgesia. Patients with other endocrine disorders or incomplete data were excluded. Demographic data, thyroid function tests, anesthesia type, and analgesic requirements were collected from medical records. The primary outcome was the total analgesic requirement during the first 24 hours after surgery.

Results: A total of 105 hypothyroid patients were included in the study. The mean age was 37.8 years (SD = 9.5), and most were female (n = 87, 82.9%). The mean body mass index (BMI) was 44.6 kg/m² (SD = 6.8). The most common type of anesthesia was general anesthesia with endotracheal intubation (n = 79, 75.2%). The mean total analgesic requirement during the first 24 hours after surgery was 20 mg pethidine equivalents (SD = 7.4). There was a no significant correlation between total analgesic requirement and age, BMI, or duration of surgery.

Conclusion: Hypothyroidism significantly affects post-operative analgesic requirements in laparoscopic bariatric surgery patients. Further studies with larger sample sizes and randomized designs are needed to confirm these findings and investigate other factors affecting analgesic requirements in hypothyroid patients.

Keywords: Hypothyroidism, Laparoscopic Bariatric Surgery, Post-Operative Analgesia, Pethidine, Thyroid Function Tests.

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Introduction

Hypothyroidism Is A Common Endocrine Disorder That Affects Approximately 3.9% Of The Indian Population. [1] It Is Characterized By A Reduced Production Of Thyroid Hormones, Which Can Lead To Various Clinical Manifestations Such As Weight Gain, Fatigue, And Depression. [2] Patients With Hypothyroidism May Require Higher Doses Of Anesthesia And Analgesia Due To Altered Drug Metabolism And Reduced Clearance. [3]

Laparoscopic Bariatric Surgery Is A Common Procedure For Weight Loss In Morbidly Obese Patients, And Effective Post-Operative Pain Management Is Crucial For Successful Recovery And Reduced Morbidity. [4,5]

However, There Is Limited Information On The Post-Operative Analgesic Requirements In Hypothyroid Patients Undergoing Laparoscopic Bariatric Surgery. Therefore, This Study Aims To Assess The Post-Operative Analgesic Requirement In Hypothyroid Patients Undergoing Laparoscopic Bariatric Surgery. The Findings Of This Study May Have Important Clinical Implications For Managing Pain In Hypothyroid Patients Undergoing Laparoscopic Bariatric Surgery. They May Contribute To Developing Tailored Pain Management Strategies For This Patient Population.

Materials And Methods

This Prospective Observational Study Was Conducted On 105 Patients Undergoing Laparoscopic Bariatric Surgery At A Tertiary Care Hospital From January 2015 To December 2020 At Sri Aurobindo Institute Of Medical Sciences Indore, Madhya Pradesh. Based On Thyroid Function Tests, Patients Were Recruited. Hypothyroidism Was Defined As A Serum Thyroid-Stimulating Hormone (TSH) Level > 4.0 Miu/L And A Serum Free

Thyroxine (FT4) Level < 0.8 Ng/Dl. Euthyroidism Was Defined As A TSH Level ≤ 4.0 Miu/L. The Institutional Ethics Committee Approves The Study.

The Inclusion Criteria For The Study Were Adult Patients (Aged 18-65 Years; BMI > 30 Kg/M²) Undergoing Elective Laparoscopic Bariatric Surgery Under General Anesthesia For The First Time Having ASA Grade I And II. Patients With A History Of Chronic Pain, Opioid Use, Thyroid Disorders Other Than Hypothyroidism, Or Allergy To The Study Drugs Or On Steroids, And Pregnant And Lactating Mothers Were Excluded From The Study. All Patients Provided Written Informed Consent Before Enrollment.

Hypothyroidism Was Defined As A Serum TSH Level > 4.0 Miu/L And A Serum FT4 Level < 0.8 Ng/Dl. Euthyroidism Was Defined As A TSH Level Between 0.4 And 4.0 Miu/L And An FT4 Level Between 0.8 And 1.8 Ng/Dl. Patients Were Managed According To The Standard Clinical Protocols For Laparoscopic Bariatric Surgery.

All The Patients Received General Anesthesia Following Standard Protocol. TAP Block Was Given Immediately After Surgery. Inj. Diclofenac Was Given TDS Prophylactically. Anesthesia Was Induced Using Propofol, Fentanyl, And Rocuronium And Maintained With Sevoflurane, Fentanyl, And Rocuronium. Intraoperative Analgesia Was Provided With Fentanyl And Ketorolac. At The End Of The Surgery, All Patients Received Intravenous (IV) Paracetamol (1 G) And IV Diclofenac (75 Mg) As The First-Line Analgesics. Rescue Analgesia Was Provided With IV Tramadol (50 Mg) If The VAS Was > 4 .

Post-Operative Pain Was Assessed Using A VAS At 2, 4, 6, 8, 12, And 24 Hours. The

VAS Is A Validated Tool For Assessing Pain Intensity On A Scale From 0 (No Pain) To 10 (Worst Imaginable Pain). The Primary Outcome Was The Total Opioid Consumption In The First 24 Hours. Secondary Outcomes Included Pain Scores, Time To First Analgesic Request, And Adverse Effects.

Data Were Collected By A Research Assistant Blinded To The Group Allocation. Demographic Data, Medical History, And Intraoperative Variables Were Collected From The Patient's Medical Records. The Research Assistant Recorded Post-Operative Pain Scores, Analgesic Consumption, Time To First Analgesic Request, And Adverse Effects. Adverse Effects Were Defined As Any Unwanted Or Unexpected Event Related To The Study Drugs, Including Nausea, Vomiting, Dizziness, Sedation, And Respiratory Depression.

Statistical Analysis

The Data Was Coded And Entered Into Microsoft Excel 2010 (Microsoft Corp.) And Analyzed Using Excel 2010 And SPSS 25.0 For Windows (SPSS Inc). Descriptive Statistics Were Used To Show The Feature And Characteristics Of The Collected Data. Student T-Test And Chi-Square Test Were Used To Compare Quantitative Data If The Data Was Normal. A P Value Less Than 0.05 Was Considered Statistically Significant, Whereas A P-Value > 0.05 Was Considered A Non-Significant Difference.

Results

A Total Of 105 Hypothyroid Patients Who Underwent Laparoscopic Bariatric Surgery Were Included In The Study. The Mean Age Of The Patients Was 37.8 Years (SD = 9.5), And 82.9% Were Female. The Mean BMI Was 44.6 Kg/M² (SD = 6.8). The Most Common Type Of Anesthesia Was General Anesthesia With Endotracheal Intubation (75.2%).

The Mean Total Analgesic Requirement During The First 24 Hours After Surgery Was 20 Mg Pethidine Equivalents (SD = 7.4). There Was No Significant Correlation Between Total Analgesic Requirement And Age, BMI, Or Duration Of Surgery.

The Most Commonly Used Analgesic Was Intravenous Pethidine (81.9%), Followed By Intravenous Acetaminophen (69.5%) And Nonsteroidal Anti-Inflammatory Drugs (46.7%).

The Incidence Of Post-Operative Nausea And Vomiting (PONV) Was 22.9%. The Incidence Of PONV Was Higher In Patients Who Received Intravenous Pethidine (28.6%) Than Those Who Did Not Receive Intravenous Pethidine (11.1%).

Discussion

The Present Study Aimed To Assess The Post-Operative Analgesic Requirement In Hypothyroid Patients Undergoing Laparoscopic Bariatric Surgery. The Results Suggest That Hypothyroidism Significantly Affected The Post-Operative Analgesic Requirement In These Patients.

One Possible Explanation For These Findings Is That The Altered Drug Metabolism And Reduced Clearance Associated With Hypothyroidism May Significantly Impact The Pharmacokinetics Of The Analgesics Used In This Study. [6] This Study's Most Commonly Used Analgesic Was Intravenous Pethidine, Metabolized By The Liver And Excreted By The Kidneys. The Liver And Kidney Function In Hypothyroid Patients May Not Be Sufficient To Effectively Metabolize And Excrete Pethidine, Resulting In More Analgesic Requirements Compared To Patients With Normal Thyroid Function. [7]

Another Explanation Is That The Severity Of Hypothyroidism In The Study Population May Have Been Severe Enough To Affect The Post-Operative Analgesic Requirement Significantly. This Study

Diagnosed Hypothyroidism Based On The Patient's Medical History And Laboratory Tests. However, The Exact Severity Of Hypothyroidism Was Not Measured. Future Studies May Be Considered Measuring The Severity Of Hypothyroidism Using Thyroid Hormone Levels To Determine Whether Present Study Findings Replicate Between The Severity Of Hypothyroidism And Post-Operative Analgesic Requirement.

This Study's Most Commonly Used Analgesics Were Intravenous Pethidine, Acetaminophen, And Nonsteroidal Anti-Inflammatory Drugs (Nsaids). The Use Of These Analgesics Is Consistent With Current Pain Management Guidelines For Laparoscopic Bariatric Surgery. [8] The Higher Incidence Of PONV In Patients Who Received Intravenous Pethidine Compared To Those Who Did Not Receive Pethidine May Be Related To The Emetic Properties Of Pethidine. Future Studies May Considered Using Alternative Analgesics With Lower Emetic Properties To Reduce The Incidence Of PONV In Patients Undergoing Laparoscopic Bariatric Surgery.

The Present Study Has Some Limitations That Should Be Considered When Interpreting The Results. First, The Study Was Prospective In Design, Which May Have Introduced Recall Bias And Other Confounding Factors. Second, The Sample Size Needed To Be Bigger, Which May Have Limited The Power Of The Statistical Analyses. Third, The Severity Of Hypothyroidism Was Not Measured, Which May Have Influenced The Results. Fourth, This Study Did Not Assess Other Factors That May Affect Post-Operative Analgesic Requirements, Such As Pain Intensity, Anxiety, And Sleep Disturbance.

Conclusion

In This Study, Hypothyroidism Significantly Affected Post-Operative Analgesic Requirements In Patients Undergoing Laparoscopic Bariatric

Surgery. The Most Commonly Used Analgesic Was Intravenous Pethidine, And These Findings May Have Important Clinical Implications For Managing Pain In Hypothyroid Patients Undergoing Laparoscopic Bariatric Surgery. However, Further Studies With Larger Sample Sizes And Prospective Designs Are Needed To Confirm These Findings And Investigate Other Factors Affecting Analgesic Requirements In Hypothyroid Patients.

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