

# Propofol and S-Ketamine Monitored Anesthesia Care for Colonoscopy: Implications on Patients' Discharge

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## Abstract

**Introduction:** The objective of this study is to report the implications in discharge criteria of patients that were submitted to ambulatory colonoscopy under monitored anesthesia care with propofol and S-ketamine.

**Methods and Materials:** Fifty four patients submitted to ambulatory colonoscopy were studied. Drug administration protocol included propofol and S-ketamine. Sedation was maintained according with the patient's responses or the procedure's requirements.

**Results:** Females were predominant among the patients. ASA II classification represented the preponderant physical state. All the patients could be directly transferred from the procedure room to the intermediary recovery phase room. Nausea and vomiting did not occur. Two female patients presented hallucinations that withdrawn in less than 25 minutes, without any treatment. Any patient presented other complications that could delay the discharge and all of them were home discharged with a responsible adult.

**Conclusions:** Propofol and S-ketamine sedation technique provided a usual discharge, with minimal complications, in patients submitted to ambulatory colonoscopy.

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## INTRODUCTION

Ambulatory anesthesia allows the patients a prompt recovery without the need to stay overnight at the hospital. Therefore, patients return earlier to their occupations and households, have less exposure to infections, and hospital costs are reduced. The ambulatory unit requires appropriate substructure which is regulated by the Federal Medicine Council Resolutions<sup>1</sup>. Owing to the increasing number of patients being submitted to ambulatory anesthesia regimen, the anesthesiologist plays an essential role in the patients' selection proceedings. Colonoscopy is frequently performed in ambulatory regimen and, often, requires the cooperation of the patient. In most of these cases, monitored anesthesia care presents some advantages, offering comfort and safety to the patient in addition to a faster recovery with a better airway control, minor aspiration risk, and continuous

evaluation of the mental state<sup>2,3,4</sup>.

The aim of this study is to relate the implications, in the conditions of home discharge, of patients submitted to the ambulatory colonoscopy, under monitored anesthesia care, carried trough with propofol and S-ketamine.

## METHODS AND MATERIALS

This study was performed at the Digestive Endoscopy Service. After approval by the Committee of Ethics in Research and the patient prior written consent, 54 patients sceduled for ambulatory colonoscopy were included in the study. Were excluded patients who presented with unstable angina, recent myocardium infarction, uncontrolled arterial hypertension, aneurysm, pulmonary hypertension, hemorrhagic masses in the central nervous system, tireotoxicosis, schizophrenia, major depression, pregnancy and previous history of allergy to propofol and/or S-ketamine<sup>5</sup>. Conditions that increase or reduce the risk of nausea or vomit were recorded <sup>6</sup>. No patient received

prophylaxis for nausea or vomiting. The protocol of administration of the sedation was flexible and based in the titration. Before the beginning of the colonoscopy a propofol bolus ( $0.5\text{--}1.0\text{ mg.kg}^{-1}$ ) was administered in thirty seconds, followed by a bolus of S-ketamine ( $0.15\text{--}0.25\text{ mg.kg}^{-1}$ ) in, at least, sixty seconds. Maintenance was accomplished with bolus of propofol or S-ketamine according to the need of the patient or the procedure. The sedation score was adjusted to achieve 2 to 4 points in the scale of Ramsay<sub>7</sub>.

The duration of the procedure and the total dose of propofol and S-ketamine were recorded. The patients that, in the end of the procedure, presented with a score of 9 or 10 points in the scale of Aldrete were admitted directly in intermediate recovery phase. Before home discharge, the patients were evaluated again, and discharged home when they achieved 9 or 10 points according to scale of Chung.

The time between the admission in the intermediate recovery phase and home discharge was recorded<sub>8</sub>. Anesthetic or surgical complications like nausea or vomit, residual sedation, hypoxemia, hallucination, mental confusion and others were recorded.

## RESULTS

Fifty seven patients were candidates to the study, however, three were excluded due to uncontrolled arterial hypertension, major depression and refusal in participate the study. Among the patients, there was predominance of the female sex. The physical state ASA II was the most frequent one.

Among the factors that increase to incidence of postoperative nausea and vomiting, five patients presented obesity (body mass index above  $26\text{ kg.m}^{-2}$ ), three patients presented previous history of motion sickness and two other were very anxious. In all of the cases sedation could be maintained with the administration of propofol and S-ketamine, not exceeding the recommended doses.

The sedation score were maintained between 2 and 4 points, most of the time, using the scale of Ramsay. All the patients could be directly transferred from the procedure room to the intermediate phase of recuperation, where they had remained, with the familiar ones, under health professionals' supervision. No patient presented with nausea and/or vomiting. Three patients of the female sex presented hallucinations that regressed in less than 25 minutes, without requiring any type of treatment. Hypoxemia, mental

confusion or other complications that could delay the discharge were not observed in any patient. All of them were discharged home, accompanied with an adult responsible.

## DISCUSSION

Modern venous anesthesia permits association of several drugs, benefiting of the advantages of each one. S-ketamine is a drug of intense analgesia and faster onset, which produces dissociative anesthesia<sub>9</sub>. Comparing to racemic mixture, the levogire isomer, S-ketamine, presents lesser incidence of hallucinations and a faster recovery of cognitive functions<sub>10,11,12</sub>. Propofol provides a titrable hypnosis, a smooth and promptly recuperation, due to his high rate of clearance, being its use very interesting anesthesia ambulatory<sub>13, 14</sub>. The use of the propofol associated to S-ketamine, possess a complementary effect: propofol reduces to incidence of the hallucinatory, hemodynamic and of salivatory effects induced by S-ketamine, and this produces minor respiratory depression and keeps better preserved the protective airway reflexes<sub>15,16,17,18</sub>. Would be very interesting, therefore, to evaluate the implications of the use of this technique of sedation in the incidence of postoperative complications and home discharge. Among the patients excluded of the study, one presented major depression, to whom we opt to not administer S-ketamine, as the established contraindications. However, a recent study has shown that S-ketamine administration reduces suicidal tendencies and hypochondria in the postoperative period in patients with major depression<sub>19</sub>. In order to standardize the score of sedation and provide an objective evaluation, the scale of Ramsay was opted, mainly, due to its easy application. All the other sedation scales were excluded because they included variables in its score that are modified by S-ketamine administration, as hemodynamic indexes (arterial blood pressure and cardiac frequency) and/or the capacity of maintain the eyes opened (S-ketamine administration allows the patient to maintain the eyes opened spontaneously). Although five patients had presented an increased risk for postoperative nausea and vomiting, there was not verified the occurrence of these events in none of them. Possible explanations include the antiemetic effect of propofol and the omission of opiates administration. Hallucinations were observed in three patients of the female sex, what corresponds approximately to 5% of the sample. This incidence comes close to data previously published<sub>14</sub>.

All the patients could directly have been transferred from the procedure room to the intermediate recovery phase and

home discharge was not postponed in any of the cases. In spite of the small studied sampling, the anesthetic technique employed and the procedure itself, by lower potential of presenting complications, contributed for this performance. Concluding, in this group of patients, monitored anesthesia care with propofol and S-ketamine provided an uneventful home discharge, according to the standards established and with minimum index of complications.

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