ELSEVIER

JMIG The Journal of Minimally Invasive Gynecology

Original Article

Inhalation Analgesia With Nitrous Oxide Versus Other Analgesic Techniques in Hysteroscopic Polypectomy: A Pilot Study

Cristina del Valle Rubido, MD*, Juan Antonio Solano Calvo, MD, PhD, Antonio Rodríguez Miguel, MD, Juan José Delgado Espeja, MD, Jerónimo González Hinojosa, MD, and Álvaro Zapico Goñi, MD, PhD

From the Departments of Obstetrics and Gynecology (Drs. Del Valle, Solano, Delgado, González, and Zapico), and Pharmacology (Dr. Rodríguez), Hospital Universitario Príncipe de Asturias, Madrid, Spain.

ABSTRACT **Study Objective:** To show the decrease in pain and better tolerance to inhalation analgesia with a 50% equimolar mixture of nitrogen protoxide and oxygen in hysteroscopic polypectomy compared with paracervical anesthesia and a control group.

Design: One hundred six patients scheduled for office hysteroscopy and polypectomy were divided into the following 3 groups: the control group, the nitrous oxide group, and the paracervical infiltration group. Patients were assigned sequentially (Canadian Task Force classification II-1).

Setting: The study took place in a hysteroscopy outpatient clinic under the supervision of a gynecologist and 2 nurses trained to cooperate in the trial.

Patients: One hundred six women from Area III of Madrid Community, Spain, who had been diagnosed with endometrial polyps at a gynecology office and were scheduled for office hysteroscopy and polypectomy agreed to participate in the study.

Interventions: Patients in group 1 (control group) received no treatment. Group 2 received inhaled nitrous oxide and group 3 paracervical infiltration with 1% lidocaine.

Measurements and Main Results: Pain was assessed using the visual analog scale (0–10). Pain perceived by patients was lower in the nitrous Oxide group (mean: 3.55 $\pm$ 0.60, median: 3) versus the control group (mean: 5.49 $\pm$ 1.88, median: 6, $p < .05$) and the paracervical infiltration group (mean: 4.22 $\pm$ 1.73, median: 5). Tolerance to pain, assessed by the medical staff using qualitative variables, was bad for the control group, very good for the nitrous oxide group, and good for the paracervical infiltration group ($p < .05$). There were no complications in 82% of the patients in the nitrous oxide group, whereas in the paracervical infiltration group, there were complications in more than 50% of the patients. No severe complications occurred.

Conclusion: Nitrous oxide is a safe and effective analgesic technique for polipectomy office hysteroscopy compared with the paracervical infiltration and control groups. Journal of Minimally Invasive Gynecology (2015) 22, 595–600 © 2015 AAGL. All rights reserved.

Keywords: Analgesia; Endometrial polyp; Hysteroscopy; Nitrous oxide; Polypectomy

DISCUSS You can discuss this article with its authors and with other AAGL members at **http://www.AAGL.org/jmig-22-4-JMIG-D-14-00509**

Use your Smartphone to scan this QR code and connect to the discussion forum for this article now*

* Download a free QR Code scanner by searching for "QR scanner" in your smartphone's app store or app marketplace.

The aim of our study was to show that pain perceived by the patients undergoing hysteroscopic polypectomy decreases significantly with the administration of an equimolar mixture of nitrous oxide and oxygen (nitrous oxide). This has been assessed by comparing nitrous oxide with the standard technique (i.e., paracervical analgesia with 1% lidocaine) and a control group (without treatment).

The authors declare no conflict of interest.

Corresponding author: Cristina del Valle Rubido, MD, c/o Monasterio de Caaveiro 13, 28049 Madrid, Spain.
E-mail: cristinadelvallerubido@gmail.com

Submitted October 13, 2014. Accepted for publication January 8, 2015.
Available at www.sciencedirect.com and www.jmig.org

1553-4650/$ - see front matter
http://dx.doi.org/10.1016/j.jmig.2015.01.005

This is a study of 106 patients from Area III of Madrid Community, Spain, diagnosed with endometrial polyps in a gynecology office from January to October 2013. All of them were scheduled for office hysteroscopy and polypectomy.

The participants were divided into the following 3 groups:

1. Group 1: control group; no treatment was administered to the patients of this group.
2. Group 2: nitrous oxide; they received treatment with an inhaled equimolar mixture of nitrous oxide and oxygen during hysteroscopy.
3. Group 3: paracervical infiltration; they underwent paracervical infiltration of 1% lidocaine before hysteroscopy.

Participants Were Assigned to the Groups Sequentially According to the Usual Clinical Practice

The surgical instruments used for the procedure were a Karl Storz double-way 3.5-mm hysteroscope with 0.9% saline solution irrigation and Karl Storz scissors (Karl Storz GmbH & Co., Tuttlingen, Germany) or a Versapoint Twizzle 5F electrode (Karl Storz GmbH & Co.) for polypectomy. Nitrous oxide was administered via the pulmonary route through a facial mask or pipette that was connected to an antibacterial single-use filter. The flow of the gas mixture was enabled by an on-demand valve connected to the mask or pipette. When the patient inhaled, the valve opened, and it closed during exhalation. The gas mixture was autoadministered under medical supervision at all times. Local anesthesia with paracervical infiltration was administered using a speculum and injecting 10 mL 1% lidocaine at 3, 6, 9, and 12 hours, intracervical and uterosacral. Epinephrine was not used for local anesthesia.

Pain was assessed using the visual analog scale (VAS), a measurement instrument that uses continuous variables because pain is not easily measured by direct variables. Pain intensity is represented on a 10-cm line. One end of the line is marked as "no pain" and the opposite end as "the worst pain you can imagine." In our study, the distance in centimeters from the "no pain" point to the one marked by the patient represents pain intensity (from 0–10).

Test statistics and p values have been independently estimated using SPSS 15.0 (SPSS Inc., Chicago, IL). A p value $< .05$ was considered statistically significant. Additionally, we have evaluated the complications of each analgesic technique, tolerance to pain, and descriptive statistic data that can contribute information on demographic data. One-way analysis of variance (ANOVA) followed by the Scheffé multiple comparison test or the Kruskal-Wallis nonparametric test were used, when suitable, for quantitative variables. The Fisher exact test or Pearson chi-square test was used for categoric variables when appropriate. Confidence intervals (CIs) were set at 95%.

Results

The patients ranged in age from 24 to 84 years, with a mean age of 47 years old at the time of hysteroscopy. Fifty-eight percent of the patients were premenopausal, and 42% were postmenopausal. Ninety percent were white, 6.2% were black, and 1.2% were Asian.

Pain perceived by the patients, assessed using the VAS from 0 to 10, had the following mean value for each group (Fig. 1): group 1 (control group): 5.49 ± 1.88 (95% CI), group 2 (nitrous oxide): 3.55 ± 0.60 (95% CI), and group 3 (paracervical infiltration): 4.22 ± 1.73 (95% CI).

The difference was statistically significant when we compared the nitrous oxide group with the control group ($p = .05$). However, statistical significance was not achieved when the paracervical infiltration group was compared with any of the other groups ($p = .47$ compared with the control group and $p = .72$ compared with the nitrous oxide group). This analysis was calculated using 1-way ANOVA with Scheffé correction.

Nevertheless, if we take the median into account, which shows the tendency of each group, it is clear that nitrous

Fig. 1

Comparison of the mean punctuation of pain assessed by the VAS for the control, nitrous oxide, and paracervical infiltration groups. Statistical analysis: 1-way ANOVA test with Scheffé correlation.