

# Pain evaluation during carbon dioxide laser vaporization for cervical intraepithelial neoplasia: a randomized trial

A. FREGA - P. STENTELLA - F. DI RENZI - G. GALLO - P. L. PALAZZETTI  
M. DEL VESCOVO - M. CICCARONE - A. PACHI'

*Summary:* 63 pts affected by CIN of various degrees were randomly divided into 3 groups in order to evaluate the pain experienced during laser vaporization of the lesion. All pts were premenopausal and ages ranged between 19 and 39 years. 21 pts received Naproxene Sodium (550 mg) 30 minutes before surgery; 21 pts received placebo and 21 pts received no drug. Laser vaporization was performed with a Coherent System 451 CO<sub>2</sub> laser with a power setting of 28 W/cm<sup>2</sup> and a spot size of 1.8 mm. The severity of pain was assessed by means of a Visual Analogue Scale. The mean VAS value was 19 for the group treated with Naproxene Sodium; the mean VAS value was 20 for the placebo group and 23 for the group which received no pre-operative drug. Analysis of data from the 3 groups showed no statistically significant difference. Analgesia or anaesthesia before laser surgery for CIN is not a necessity.

*Key words:* Pain; Laser surgery; Cervical Intraepithelial Neoplasia; Analgesia.

## INTRODUCTION

Today a wide range of therapies is available for the management of cervical intraepithelial neoplasia (CIN).

Among these, laser vaporization is the most commonly used due to its special characteristics<sup>(1-3)</sup>.

Laser vaporization of CIN can be carried out without either analgesia or anaesthesia; nonetheless, there is no common evaluation of the degree of pain caused by cervical CO<sub>2</sub> laser treatment. Furthermore,

there are broad variations in the suggested type of analgesia or anaesthesia which can be adopted before treatment<sup>(4-10)</sup>.

Pain felt by patients during cervical laser surgery seems to be due to the increasing thermal stimulation exerted on the sensitive nervous C fibers of the cervix; more frequently patients report not a real pain, rather a painful sensation – probably linked to the release of prostaglandins – resembling the cramps typical of the menstrual cycle<sup>(11, 12)</sup>.

In order to evaluate the pain caused to patients during CO<sub>2</sub> laser vaporization, we carried out a randomized study on 63 patients with different degrees of CIN. Patients were divided into three groups of 21 persons each; the first group was ad-

---

University of Rome "La Sapienza"  
II Clinic of Obstetrics and Gynecology

*All rights reserved* — No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, nor any information storage and retrieval system without written permission from the copyright owner.

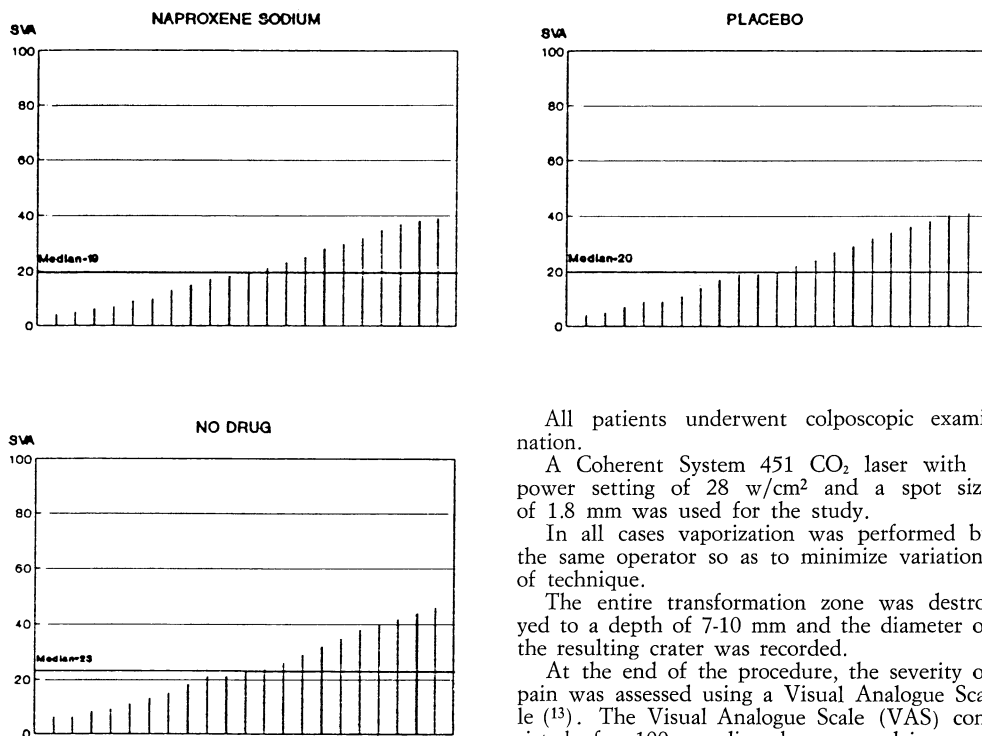


Fig. 1. — VAS values during carbon dioxide laser surgery for cervical intraepithelial neoplasia. The median score is indicated by the horizontal line.

ministered with Naproxene sodium; the second group received a placebo and the third no drug.

#### MATERIALS AND METHODS

Our study was a random comparison of three groups of patients undergoing CO<sub>2</sub> laser vaporization for CIN. Each group consisted of 21 patients. All patients were premenopausal and their ages ranged between 19 and 39 years (mean = 27).

One group received Naproxene sodium (550 mg) half an hour before treatment; the second group received a placebo half an hour before treatment, and the last one received no drug.

All patients gave their consent to treatment following a description of the technique and the nature of the trial.

All patients underwent colposcopic examination.

A Coherent System 451 CO<sub>2</sub> laser with a power setting of 28 w/cm<sup>2</sup> and a spot size of 1.8 mm was used for the study.

In all cases vaporization was performed by the same operator so as to minimize variations of technique.

The entire transformation zone was destroyed to a depth of 7-10 mm and the diameter of the resulting crater was recorded.

At the end of the procedure, the severity of pain was assessed using a Visual Analogue Scale (13). The Visual Analogue Scale (VAS) consisted of a 100 mm line drawn on plain paper and represented pain ranging from "no pain" to "intolerable pain".

Data analysis was performed using the T Students Test.

#### RESULTS

For the group treated with 550 mg of Naproxene sodium 30 minutes before vaporization, the mean VAS value was 19 (range 4-35); for the placebo group the average VAS value was 20 (range 4-41); lastly, for the group of patients undergoing CO<sub>2</sub> laser vaporization without any pre-operative analgesia, the mean VAS value was 23 (range 6-46) (Fig. 1).

No patient from any group experienced intolerable pain or a pain such as to suspend laser treatment.

In the third patient group pain was considered slight or moderate in some cases.

About 80% of patients described the pain as similar to a cramp-like sensation

(like menstrual pain); the remaining patients described the pain like a sensation of heat or a pinch.

The statistical analysis of the finding – compared by coupling them together – from the three groups showed no statistically significant difference (Naproxene sodium vs placebo:  $p < 0.73$ ; Naproxene sodium vs no drug:  $p < 0.34$ ; placebo vs no drug:  $p < 0.54$ ).

## DISCUSSION

In our study groups, the different degrees of pain during laser treatment were not statistically significant, although in the group that did not undergo pre-operative therapy the pain felt was slightly greater.

The pain caused by CIN laser vaporization, which has to reach a depth of at least 6 - 10 mm to be effective (<sup>14, 15</sup>), derives partially from the thermal stimulation produced by the laser beam acting on the cervix sensitive nervous C fibers; the induced summation process transforms the sense of heat into pain.

Besides this physical aspect of the pain, there is also the prostaglandin component that induces the uterine contractile activity, thus accounting for the cramp-like disturbances reported by patients.

On the basis of these clinical considerations, we believe that Naproxene sodium – also extremely effective in the treatment of dysmenorrhea – represented an effective medical approach since it acts specifically on the physiopathology of pain through peripheral analgesia and the inhibition of the prostaglandin chain reaction.

However the analysis of our findings showed no significant difference between the group treated with Naproxene sodium and the placebo group ( $p < 0.73$ ).

This results suggests that in the genesis of the pain caused by laser surgery of CIN other misleading variables may inter-

vene, such as: the interaction with endorphine neuropeptides and other hormones, patient-specific pain threshold and a possible psycho-behavioural component which may be related to the kind of pathology, and above all to the surgical treatment to be used (<sup>16</sup>).

## ACKNOWLEDGEMENTS

We would like to thank Giuseppina Di Renzi for editorial assistance.

## REFERENCES

- 1) Bagghish M. S.: "High-power-density carbon dioxide laser for early cervical neoplasia". *Am. J. Obst. Gyn.*, 1980, 136, 117.
- 2) Bagghish M. S.: "Management of cervical intraepithelial neoplasia by carbon dioxide laser". *Obst. Gyn.*, 1982, 60, 378.
- 3) Bagghish M. S., Dorsey J. H., Andelson M.: "A ten year experience treating cervical intraepithelial neoplasia with the CO<sub>2</sub> laser". *Am. J. Obst. Gyn.*, 1989, 161, 60.
- 4) Bagghish M. S.: "Complication associated with carbon dioxide laser surgery in gynecology". *Am. J. Obst. Gyn.*, 1981, 139, 568.
- 5) Lowles I. E., Al-Kurdy M., Hare M. J.: "Women's recollection of pain during and after carbon dioxide laser to uterine cervix". *Br. J. Obst. Gyn.*, 1983, 90, 1157.
- 6) Lee E. T. C., Ozumba E. N., Bevan J. R.: "A randomized trial of Citanest with Octapressin for relief of pain associated with laser vaporization of the cervix". *Br. J. Obst. Gyn.*, 1986, 93, 967.
- 7) Berget A., Andreasson B., Bock J. E.: "Out-patient treatment of cervical intraepithelial neoplasia". *Acta Obst. Gyn., Scand.*, 1987, 66, 531.
- 8) Mikhai M. G. S., Bevan J. R.: "A randomized trial of the use of cocaine spray to provide pain relief during laser vaporization of the cervix". *Br. J. Obst. Gyn.*, 1988, 95, 469.
- 9) Johnson N., Crompton A. C., Ramsden S. V. B.: "The efficacy of paracervical injections of lignocaine before laser ablation of the cervical transformation zone. A randomized placebo-controlled double-blind clinical trial". *Br. J. Obst. Gyn.*, 1989, 96, 1410.
- 10) Goodman J. D. S., Sumner D.: "Patient acceptability of laser and cold coagulation therapy from pre-malignant disease of the uterine cervix". *Br. J. Obst. Gyn.*, 1991, 98, 1168.

- 11) Bagghish M.S.: "Laser management of cervical intraepithelial neoplasia". *Clin. Obst. Gyn.*, 1983, 26, 980.
- 12) Julian T.M., O'Connel B.J., Gosewehr J. A.: "The relationship between pain and uterine contractions during laser vaporization of the cervix". *Obst. Gyn.*, 1992, 79, 689.
- 13) Scott J., Huskisson E. C.: "Graphic representation of pain". *Pain*, 1976, 2, 175.
- 14) Anderson M.C., Hartley R.B.: "Cervical crypt involvement by intraepithelial neoplasia". *Obst. Gyn.*, 1980, 5, 546.
- 15) Boonstra H., Aalders J.G., Koudstaal J., Oosterhuis J.W., Janssens J.: "Minimum extension and appropriate topographic position of tissue destruction for treatment of cervical intraepithelial neoplasia". *Obst. Gyn.*, 1990, 75, 227.
- 16) Johnson N., Crompton A.C., Parker J.: "The correlation between dysmenorrhea and the pain experienced during laser ablation of a cervical lesion". *Gyn. Oncol.*, 1990, 36, 215.

---

Address reprints requests to:  
A. FREGA  
II Institute of Obstetrics and Gynecology  
Viale del Policlinico, 155  
00161 Roma (Italy)