Ineffectiveness of Topical Benzocaine Spray During Colposcopy

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BACKGROUND. Colposcopic evaluation can cause patients to experience pain and anxiety. This study investigated the use of benzocaine spray, a topical anesthetic, and its effects on pain and anxiety associated with colposcopy and colposcopic biopsy.

METHODS. The study was a double-blind, placebo-controlled trial of the effectiveness of benzocaine spray applied to the cervix immediately before colposcopic examination, cervical biopsy, or endocervical curettage in patients of a family practice center. Prior to the gynecologic procedure the patient's cervix was sprayed with either benzocaine spray or matching placebo spray. After waiting at least 30 seconds the clinician started the procedure. Pain and anxiety, measured on 10-cm visual analog scales, were determined at the following times: (1) before the start of the gynecologic examination; (2) immediately before using the spray; (3) immediately after using the spray; and, (4) after the procedure was completed.

RESULTS. Of 58 consecutive patients who underwent colposcopy, 36 patients were eligible for the trial and were evaluated. Participants were similar to patients not participating with regard to race, gravidity, and parity. Statistical analysis found significant differences in both pain and anxiety scores over time (repeated measures multivariate ANOVA, $P < .0001$), but no difference between the use of active drug and placebo. Pain scores increased significantly after application of either benzocaine or placebo spray before the start of the procedure (average increase 1.3 cm, $P < .0001$).

CONCLUSIONS. Benzocaine, in a spray vehicle, confers no benefit when used to decrease pain and anxiety in women undergoing colposcopic procedures.

KEY WORDS. Anesthesia, local; colposcopy; benzocaine; cervix uteri. *(J Fam Pract 1998; 46: 242-246)*

Commonly performed gynecologic procedures can sometimes result in pain and anxiety. Several investigators have tried various methods to decrease pain with the use of a topical analgesic alone or in combination with an oral nonsteroidal anti-inflammatory agent.[1-6] Some of these trials have shown benefit but have been of limited value because of their study design.

A number of topical anesthetics are available to anesthetize mucous membranes. Benzocaine, dyclonine, lidocaine, and tetracaine are available in solution, gel, or spray formulations. Spray formulations with a disposable applicator are simple and easy to apply.

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The aim of this study was to compare topical anesthesia using benzocaine 20% topical spray with placebo spray in the prevention of pain and anxiety associated with endocervical curettage and biopsy performed during colposcopic examination in a family practice office.

METHODS

A prospective, double-blind, placebo-controlled trial of topical anesthesia during colposcopy was performed at a teaching site for the Harrisburg Family Practice Residency Program. Consecutive patients scheduled for colposcopic examination were approached to participate in this study. Examinations were performed by either faculty or supervised residents. Patients were excluded if they were younger than 18 years old, pregnant, allergic to benzocaine, non-English speaking, or if they had a history of narcotic substance abuse. Informed consent was obtained from each patient. Patients also were asked to list any medications taken within the past 24 hours.

Patients were randomly assigned to receive either benzocaine 20% topical spray or placebo. To assure blinding, four identical spray bottles were used. Two bottles contained placebo and two bottles contained benzocaine. Patients in the study were allocated in blocks of four, randomly assigned using a random number table to receive treatment with the contents of one of the four bottles.

The patient was prepared for the procedure in the normal manner after the collection of demographic information and the completion of baseline pain and anxiety scales by the study nurse. Following insertion of the speculum, but before the procedure was started, a short (two-second) spray was applied to the cervix using a disposable applicator tube. Examiners waited at least 30 seconds before starting the procedure. The procedure included endocervial curettage with a curette, with a biopsy sample taken using biopsy forceps if necessary.

Pain and anxiety were measured using separate 10-cm visual analog scales (VAS). Pain scales were labeled at the left end with "no pain" and at the right end with "worst pain imaginable." Anxiety scales were labeled "no anxiety" and "extreme anxiety," and anxiety was defined as "nervousness" in the instructions. Patients were given the printed scales attached to a clipboard and were asked to represent their level of pain by drawing a single vertical line through the horizontal scale.

Pain and anxiety initially were measured at three intervals: before undressing for the examination, immediately before the spray was applied and after completion of the procedure. "Clinically significant" pain was defined as a change of ≥1.3 cm on the 10-cm VAS as documented previously.[7]

At the start of the trial several patients reported stinging when the spray was applied. To more precisely evaluate the effect of the spray itself on pain score, we changed the protocol and included a fourth set of pain and anxiety measurements. These data were obtained immediately after the spray was applied but before the procedure was started.

Statistical analysis was performed using the chi-square statistic for categorical data and the unpaired *t* test for continuous demographic data. Differences in pain and anxiety scores across time and between the two interventions at each time point were evaluated using the two-factor repeated measures ANOVA statistic. Using a variance based on previously reported data[4] and an expected mean difference of 2.0 cm, a minimum sample size of 32 was calculated to yield a power of 0.8 at an alpha level of 0.05.[8]

RESULTS

Colposcopy was performed in the family practice center on 58 women between March and December 1996. Of these women, 22 were excluded from participation in the study: 12 met one or more of the exclusion criteria, 8 patients declined participation, and 2 were excluded because of protocol violations. Except for age (since women younger than 18 years of age were excluded), there were no differences between participants and nonparticipants with regard to demographic characteristics. Demographic information about these patients is presented in Table 1. Patients were similar in both groups with regard to age, ethnic group, gravidity, and parity.

Examinations were performed by eight different residents and three faculty members. Of the 36 women included in this study, 17 were randomly allocated to treatment with benzocaine and 19 received placebo spray. Prior to the procedure, 39% (n=14) of the women received premedication with an oral analgesic within the preceding 12 hours. There was no statistically significant difference in premedication rate between the two groups.

The first six patients enrolled in the trial did not complete a VAS immediately before use of the spray and were not included in the repeated measures ANOVA. These patients were similar to the 30

TABLE 1

Demographic Characteristics of 36 Women Patients Undergoing Colposcopy with Either Benzocaine Spray or Placebo to Control Pain and Anxiety

Variable	Placebo Group	Benzocaine Group
Mean age, years (SD)	29.5 (8.2)	31.9 (11.5)
Race, %		
Black	37	41
Hispanic	16	6
White	47	53
Median gravidity (range)	2 (0-5)	2 (0-4)
Median parity (range)	1 (0-4)	2 (0-4)
Premedicated before procedure, %	47	29

SD denotes standard deviation.

remaining patients with regard to distribution of age, race, gravidity, and parity.

Pain scores over the course of the examination are presented in Table 2. Application of the spray caused a statistically significant increase in pain over baseline (P <.0001) with pain increasing an average of 1.3 cm with a range from –2.3 cm to 4.4 cm (Figure 1). Pain scores dropped to baseline by the completion of the procedure. However, there was no difference in pain scores between control and intervention groups during the course of the procedure (F = 0.308, P = .82).

For those subjects who completed both pre- and post-spray VAS, 47% (14/30) experienced a clinically significant increase in pain (≥1.3 cm). There was no difference between the placebo and active spray in the number of patients who experienced a significant pain increase: 37.5% in the placebo group as compared with 57.1% in the benzocaine group (χ^2 = 1.158, P = .28).

A clinically significant increase in pain that remained at the end of the procedure occurred in 23% of patients who began the study, with an average increase in pain scores of 1.1 cm from baseline for the group as a whole. Some patients responded to benzocaine with pain score changes ranging from –2.3 cm to 8.8 cm. The two groups were similar with regard to the proportion of patients reporting a clinically significant increase in pain scores over baseline at the end of the study (χ^2 = 0.509, P = .94).

Anxiety scores also varied over the course of the study, with scores decreasing significantly by the end of the procedure (Table 3). Control and intervention group scores for anxiety were similar at each time period (Figure 2). Anxiety was not affected by use of the spray. Anxiety scores decreased significantly at the completion of the procedure, from 4.8 cm at the "after spray" time period to 1.8 cm at the "after procedure" time period (P <.0001).

DISCUSSION

In our study comparing topical anesthetic spray with placebo spray, benzocaine was of no benefit in decreasing pain associated with colposcopic examination. Moreover, the use of either active or placebo spray significantly increased pain scores. A third "no spray" group to further define the effect of the spray on pain during the examination would have been valuable.

The patients in the study were well-matched with regard to demographic characteristics. The patients'

FIGURE 1

Visual analog scale scores (±95% confidence interval) for pain levels reported by women undergoing colposcopy.

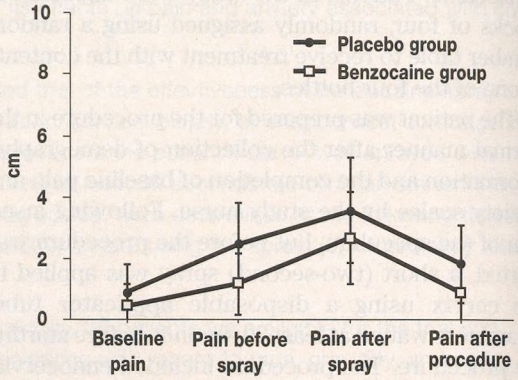


TABLE 2

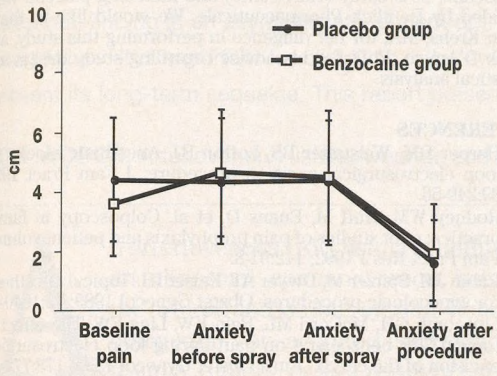
Pain Levels Reported by Women Undergoing Colposcopy with Either Placebo or Benzocaine Spray

	Placebo Group	Benzocaine Group
Baseline		
Mean (cm)	0.92	0.54
SD	1.62	1.14
Range (cm)	0 - 5.1	0 - 4.3
Before spray		
Mean (cm)	2.50	1.24
SD	2.48	1.69
Range (cm)	0.3 - 9.8	0 - 5.1
After spray		
Mean (cm)	3.63	2.75
SD	3.09	2.61
Range (cm)	0.4 - 9.9	0-7.4
After procedure		
Mean (cm)	1.92	1.00
SD	2.24	1.76
Range (cm)	0 - 7.3	0 - 6.4

SD denotes standard deviation.

FIGURE 2

Visual analog scale scores (±95% confidence interval) for anxiety levels reported by women undergoing colposcopy



use of analgesic premedication was not considered in the randomization, but was not significantly different between the two groups. Use of anti-inflammatory agents for premedication analgesia may have altered pain scores. Rodney and colleagues[2] evaluated the use of nonsteroidal anti-inflammatory medication (ibuprofen 400 mg or naproxen 375 or 500 mg) given 30 to 60 minutes before colposcopic examination.[2] The authors reported significantly lower scores of pain in patients receiving medication ($P < .05$). Of note, the study was not blinded, controlled, or randomized.

We relied on the use of a recent definition of clinically significant pain in our evaluation of pain associated with the use of the spray.[7] This definition was derived from patients presenting with acute trauma to an emergency department and was based on the correlation between patients' VAS scores and their synchronous interpretation of change in their pain at different time periods. For example, indications of pain being "a little more" or "a little less" were correlated with a VAS score obtained at the same time. Others have reported a difference of 1.4 cm[9] and 2.3 cm[10] as being the minimum clinically significant difference in pain.

A VAS scale to measure anxiety was chosen for its simplicity and its minimal impact on the examination. Other research instruments designed to obtain more global indicators of anxiety over a relatively longer period were rejected in favor of measuring the situational anxiety that was of interest in this study. The high baseline anxiety scores could have been due to fear of the impending examination or could have been increased due to a "reverse placebo effect" prompted by the uncertainty of receiving the placebo spray.[11]

It is likely that the fluorocarbon vehicle in the spray was responsible for the increase in pain demonstrated in this study. Several other investigators have studied various methods of topical anesthesia during colposcopic examination. Topical benzocaine 20% gel (not the spray) was evaluated by Rabin and colleagues[3] for its ability to reduce pain associated with cervical biopsy, IUD insertion, ECC, paracervical block, and tenaculum placement. In a blinded, unrandomized fashion, 127 women undergoing one of the procedures received either the gel or placebo. Pain was reported using a four-point categorical scale. Pain scores were significantly lower in the group receiving benzocaine gel for every procedure except culdocentesis.

In contrast, three other studies of topical anesthesia failed to find a benefit in their use. In a study of 50 patients undergoing colposcopic biopsies, patients received either lidocaine 2% topical gel or placebo applied to the cervix before the

TABLE 3

Anxiety Levels Reported by Women Undergoing Colposcopy with Either Placebo or Benzocaine Spray

	Placebo Group	Benzocaine Group
Baseline		
Mean (cm)	4.01	3.36
SD	3.49	2.90
Range (cm)	0 - 9.5	0 - 9.7
Before spray		
Mean (cm)	4.36	4.64
SD	4.64	3.62
Range (cm)	0 - 9.8	0 - 9.5
After spray		
Mean (cm)	4.60	4.15
SD	3.22	3.68
Range (cm)	0.1 - 9.9	0 - 9.3
After procedure		
Mean (cm)	1.74	2.07
SD	2.57	2.74
Range (cm)	0 - 9.4	0 - 9.4

SD denotes standard deviation.

biopsy. No difference in pain was seen between treatment and placebo, perhaps because pain scores were low in both groups, with 40% of the study subjects reporting no pain or very mild pain irrespective of treatment.[4]

Prefontaine and colleagues[5] evaluated topical lidocaine applied to the cervix before colposcopic biopsy and found no difference from placebo treatment. Munsick[6] evaluated the effectiveness of tetracaine 1% solution in 34 patients undergoing either tenaculum application to the anterior cervix or tenaculum application and insertion of an intrauterine contraceptive device (IUD). Once again, in this study, the insertion of an IUD caused little or no discomfort to patients whether or not they were pretreated with tetracaine. Patients in our study of colposcopic examinations reported widely varying pain scores at different time periods, yet on average these pain scores were very low. These results add evidence that colposcopic examination is not associated with significant pain.

CONCLUSIONS

We found that benzocaine 20% topical spray was not effective in decreasing either pain or anxiety associated with colposcopic examination. The vehicle spray caused significant pain in a majority of women and is not recommended for routine use during this procedure.

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