RESEARCH ARTICLE

Effect of Pre-Procedural State-Trait Anxiety on Pain Perception and Discomfort in Women Undergoing Colposcopy for Cervical Cytological Abnormalities

Eralp Baser*, Cihan Togrul, Emre Ozgu, Alev Esercan, Mete Caglar, Tayfun Gungor

Abstract

Background: Colposcopy is the gold standard procedure for evaluating cervical cytological abnormalities. Although it is essentially a minimally invasive intervention, referral for colposcopy may cause significant distress on patients. In this study, we aimed to determine if pre-procedural anxiety levels have a significant association with procedure related pain and discomfort in women undergoing colposcopy for evaluation of abnormal cervical cytology. We also assessed the impact of various clinical factors on anxiety, pain and discomfort in these patients. Materials and Methods: This prospective study was performed at the gynecologic oncology department of Zekai Tahir Burak Women's Health Education and Research Hospital in Ankara, Turkey between January and June 2013. After taking informed consent, State-Trait Anxiety Inventory (STAI) form and a 14-item questionnaire were filled for women who were admitted to our outpatient colposcopy unit for evaluation of abnormal cervical cytology. STAI scores were calculated for each participant. Immediately after the procedure, visual analog scale (VAS) scores for procedure-related pain and discomfort were obtained. Associations between STAI and VAS scores were investigated using correlation analyses. The effect of various contributing factors on anxiety, pain and discomfort were evaluated with linear regression analysis. The p values less than 0.05 were considered statistically significant. Results: A total of 222 women met the inclusion criteria within the study period. Mean patient age was 38.5±9.6. Median state and trait anxiety scores were 47 and 46, respectively. Median VAS scores for pain and discomfort were 4 for both variables. State anxiety had a significant correlation with procedure related discomfort (p=0.02). Colposcopy related pain VAS scores were significantly affected by state anxiety level, marital status and prior gynecological examination (p<0.05). Colposcopy related discomfort VAS scores were significantly affected by state anxiety level, marital status, prior gynecological examination and educational status. Conclusions: Additional measures should be implemented in women that carry higher risk for experiencing pain and discomfort. Social, cultural and lifestyle issues may also affect women's experiences during colposcopy, therefore further studies are needed to define specific determining factors in various populations.

Keywords: Colposcopy - anxiety - pain - discomfort

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Introduction

Colposcopy is the gold standard procedure for evaluating cervical cytological abnormalities, and is widely used for early diagnosis of pre-invasive and invasive cervical lesions (van Leeuwen et al., 2005). Although it is essentially a minimally invasive intervention, referral for colposcopy may cause significant distress on patients (Marteau et al., 1990; Rogstad, 2002). Increased anxiety may further result in impairment of health related quality of life (HRQoL) in these women (Heinonen et al., 2013).

It has been previously reported that patients with increased anxiety may carry greater risk of experiencing pain and complications during noxious medical procedures (Ludwick-Rosenthal and Neufeld, 1988). There are numerous studies that have assessed various interventions to reduce anxiety for women undergoing colposcopy (Freeman-Wang et al., 2001; Walsh et al., 2004; Danhauer et al., 2007; de Bie et al., 2011; Kola et al., 2012; 2013). Although it is obvious that reducing anxiety would have a positive psychological impact for these women, it is currently unclear that to what extent anxiety may effect pain and discomfort during this procedure. In this study, we aimed to assess the impact of pre-procedural anxiety levels on pain perception and discomfort in women undergoing colposcopy in an outpatient setting for evaluation of abnormal cervical cytology. We also investigated the possible contributing factors on anxiety

*Department of Gynecologic Oncology, Zekai Tahir Burak Women's Health Education and Research Hospital, Altindag, Ankara, Turkey *For correspondence: eralpbaser@gmail.com*

levels, pain perception and discomfort in these women.

Materials and Methods

The study was performed at the gynecologic oncology department of Zekai Tahir Burak Women's Health Education and Research Hospital in Ankara, Turkey between January and June 2013, following approval from the institutional review board. Women aged between 18-70 years with an abnormal pap-smear result requiring colposcopy were prospectively included in the study. Women with known psychiatric diseases, pregnancy, who had a previous colposcopic examination or who did not agree to participate in the study were excluded. A pre-procedural written informed consent was obtained from each participant.

State-Trait Anxiety Inventory (STAI) form and a 14-item questionnaire were filled by women who met the inclusion criteria. STAI form is a self-evaluation questionnaire, that is designed to assess an individual's momentary (state) and overall (trait) anxiety level (Spielberger et al., 1970). It consists of two sections, with first section measuring state anxiety, and the second one measuring trait anxiety. The participants responded and chose one out of four answers for 20 different statements in each section. This produced a score between 20 and 80 for each type of anxiety, where higher scores represented a higher level of anxiety. For each participant, STAI scores (state anxiety score and trait anxiety score) were calculated prior to the procedure. In the 14-item questionnaire, data regarding sociodemographics, education, obstetric and gynecologic history, in-hospital waiting duration before the procedure, contributing factors to intra-procedural discomfort, most prominent feeling during colposcopy were asked to the participants.

In all subjects, colposcopic examinations were performed in a standardized fashion by the same physician (EB). After examining the vulva, vagina and cervix with naked eye and colposcope, samples were taken for repeat cytological examination or human papillomavirus (HPV) testing, if indicated. The cervix was examined under green filter to assess vascular patterns. Afterwards, 3% acetic acid solution was applied to the cervix. Areas suspicious for a neoplastic process (i.e. acetowhite epithelium, mosaic pattern, punctuation, abnormal vessels) were biopsied, and endocervical curettage was performed. Immediately after colposcopic examination, a 10 point scale was utilized to obtain visual analog scale (VAS) scores for procedure related pain and discomfort.

SPSS 16.0 for Windows software was used for statistical analysis of the study data. Numeric variables were stated as mean±standard deviation (SD) or median (range), and categorical variables were expressed as number and percentage. After descriptive tests, Kolmogorov-Smirnov test was used to determine the data distributions. Pearson or Spearman's correlation tests were used to assess correlations, where appropriate. The effects of factors such as patient age, marital status, parity, education level, employment, number of previous gynecologic examinations, in-hospital waiting duration on state anxiety levels, pain, and discomfort were assessed using a linear regression model. The p values less than 0.05 were considered statistically significant.

Results

A total of 231 women underwent colposcopic examination within the study period. Of these, 6 women who declined to participate in the study, two women who had prior colposcopic evaluation, and one woman who had generalized anxiety disorder were excluded from the study. Two-hundred and twenty-two women were included in the final analysis. Mean patient age was 38.5±9.6 (range, 21-69). Indications for colposcopy are presented in Table 1, and patient characteristics of the study population are presented in Table 2. According to the 14-item questionnaire, 147 (66.2%) women stated discomfort due to not knowing the exact steps of the procedure, 37 (16.7%) due to fear of instruments that were used during the procedure, and 17 (7.7%) due to examination environment. Most prominent feelings that women experienced during colposcopy were fear (59%), embarrassment (11.3%) and pain (17.1%).

Median pre-procedural state and trait anxiety scores were 47 (range, 23-71) and 46 (range, 23-72), respectively. Median VAS scores for intra-procedural pain and discomfort were 4 points for both variables. Pre-procedural state anxiety score did not have a significant correlation with procedure related pain (p=0.06). However, there was a significant positive correlation between state anxiety score and procedure related discomfort (p=0.004). Pre-procedural trait anxiety score did not have a significant correlation neither with procedure related pain, nor with procedure related discomfort (p>0.05). Procedure related pain VAS score positively and strongly correlated with procedure related discomfort (correlation coefficient: 0.75, p<0.001).

On linear regression analysis, state anxiety scores were

Table 1. Indications for Colposcopy

Colposcopy Indication	N (%)
Atypical squamous cells of undetermined significance	171 (77.0)
Atypical squamous cells- cannot exclude HSIL	19 (8.6)
Low-grade squamous intraepithelial lesion	30 (13.5)
High-grade squamous intraepithelial lesion	2 (0.9)

Table 2. Patient Characteristics of the Study Population

		N (%)
Marital Status:	Single	37 (16.7)
	Married	185 (83.3)
Parity:	None	41 (18.5)
	≥1	181 (81.5)
Education:	Illiterate	4 (1.8)
	Elementary/middle school	79 (35.6)
	High school	82 (36.9)
	University	57 (25.7)
Employment:	None	130 (58.6)
	Employed	92 (41.4)
No. of Prior Gynecologic Exams:	None	46 (20.7)
	1-5	83 (37.4)
	≥6	93 (41.9)
In-Hospital Waiting Duration:	<30 min	111 (50)
	30 min - 2 hrs	60 (27)
	>2 hrs	51 (23)

not affected by patient age, education level, employment, marital status, parity, prior gynecological examinations or in-hospital waiting duration (p>0.05). Colposcopy related pain VAS scores were significantly affected by state anxiety level (B=0.038, SE=0.01, 95% confidence interval (CI) for B=0.001-0.07, p=0.04), marital status (B=-0.63, SE=0.28, 95%CI for B=-1.18-0.07, p=0.02) and prior gynecological examination (B=-0.62, SE=0.23, 95%CI for B=-0.15-1.09, p=0.01). Colposcopy related discomfort VAS scores were significantly affected by state anxiety level (B=0.06, SE=0.2, 95%CI for B=0.02-0.09, p=0.001), marital status (B=-0.74, SE=0.28, 95%CI for B=-1.31-0.18, p=0.009), prior gynecological examination (B=-0.59, SE=0.24, 95%CI for B=-0.12-1.07, p=0.014), and educational status (B=-0.52, SE=0.23, 95%CI for B=-0.99-0.05, p=0.029).

Discussion

All diagnostic medical procedures including colposcopy have a significant potential for causing excessive anxiety in patients (Williams et al., 2006; Swancutt et al., 2008; Bolukbas et al., 2010). High anxiety during colposcopy has been previously shown to be associated not only with a more difficult procedure, but also with a risk of patients' discontinuation of follow-up visits (Mao, 2002). Women who are single, parous, highly trait anxious, that anticipate pain and discomfort before colposcopy were reported to be at higher risk for experiencing precolposcopy distress (Kola and Walsh, 2012).

In a recent observational study by Heinonen et al. (2013), anxiety perception and health related quality of life (HRQoL) in women undergoing colposcopy were investigated (Heinonen et al., 2013). The authors assessed a combined prospective-retrospective cohort of women with a total of 448 subjects, and reported that a high baseline anxiety was associated with an impaired HRQoL, even after 12 months of follow-up after the procedure.

A limited number of studies have assessed various methods to reduce anxiety during colposcopy. In a randomized trial by Chan et al. (2003), the authors investigated the effect of music on women's anxiety and perceived pain during colposcopy (Chan et al., 2003). They randomized 220 women into music (n:112) and no-music (n:108) groups, and slow-rhythm music was played during colposcopy in the music group. Mean anxiety score was 45.6. The women in the music group had a more significant drop in anxiety after the procedure, and experienced less pain during colposcopy. The authors concluded that playing music during colposcopy was a simple but effective method in reducing anxiety and pain (Chan et al., 2003). In another randomized trial, the effect of detailed precolposcopy counseling on reducing anxiety was studied (Chan et al., 2004). In women who attended these counselling sessions, their knowledge about colposcopy significantly improved, and higher attendance rates to follow-up visits were observed. However, these interventions were not associated with a decrease in precolposcopy anxiety scores (Chan et al., 2004). Walsh et al. (2004) published another study on the anxiety reducing effects of educational intervention using a video colposcope, for women who had two consecutive visits for colposcopy (Walsh et al., 2004). The authors reported that patient anxiety and pain decrease was significantly higher in the group who had a video colposcopy session. In another study, listening to music or guided imagery versus no intervention was compared in colposcopy patients in terms of impact on reported anxiety, perceived pain, satisfaction with care (Danhauer et al., 2007). No between group differences were reported for anxiety and pain perception in this study. A recent Cochrane review evaluated interventions designed to reduce anxiety levels during colposcopy (Galaal et al., 2011). Six trials were included in the analysis. It was concluded that listening to music seemed to be effective in reducing anxiety during colposcopy. Information leaflets helped increasing patients' knowledge about colposcopy, however did not have any anxiety reducing effects. Leaflets also reduced psychosexual dysfunction, thereby contributed to improved patient quality of life.

In our study, we measured state and trait anxiety in women before colposcopy at an outpatient unit, and evaluated the associations with patients' pain perception and discomfort. We found that the patients in our population generally had moderate levels of state and trait anxiety, which was similar with previous studies in the literature (Chan et al., 2003). There was a significant correlation between state anxiety and procedure related discomfort. In order to decrease the discomfort that women experience during colposcopy, we suggest taking advantage of the aforementioned anxiety relieving methods, where applicable. Considering that procedure related pain and discomfort are closely associated, decreasing pain with medical or alternative methods would also alleviate sensations of discomfort, and ultimately prevent an unpleasant colposcopy experience.

Colposcopy related pain and discomfort VAS scores were significantly associated with state anxiety level, marital status and number of prior gynecological examinations. Our results suggested that single women that had a high level of state anxiety, and with fewer past gynecological examinations were more likely to experience pain and discomfort during colposcopy. We also noted that women with higher education levels experienced less discomfort than women with lower education levels during these procedures. Additional measures should be implemented in women that carry higher risk for experiencing pain and discomfort.

Social, cultural and lifestyle issues may also affect women's experiences during colposcopy, therefore further studies are needed to define specific risk factors in various populations. In our study population, nearly 70% of the women stated that not knowing the exact steps of the procedure caused discomfort for them. Therefore, supplementary material such as informative leaflets and videos should be readily available. Although in-hospital waiting times prior to colposcopy were not associated with increased state anxiety, pain or discomfort in our study, waiting times should be kept at a possible minimum.

Not only in colposcopy, but in all medical procedures, physicians should aim to provide the patients with best medical services and clinical environments, in order

to ensure sustaining a high quality of life for these individuals.

References

Bolukbas N, Erbil N, Kahraman AN (2010). Determination of the anxiety level of women who present for mammography. *Asian Pac J Cancer Prev*, **11**, 495-8.

Chan YM, Lee PW, Ng TY, Ngan HY (2004). Could precolposcopy information and counseling reduce women's anxiety and improve knowledge and compliance to follow-up? *Gynecol Oncol*, **95**, 341-6.

Chan YM, Lee PW, Ng TY, et al (2003). The use of music to reduce anxiety for patients undergoing colposcopy: a randomized trial. *Gynecol Oncol*, **91**, 213-7.

Danhauer SC, Marler B, Rutherford CA, et al (2007). Music or guided imagery for women undergoing colposcopy: a randomized controlled study of effects on anxiety, perceived pain, and patient satisfaction. *J Low Genit Tract Dis*, **11**, 39-45.

De Bie RP, Massuger LF, Lenselink CH, et al (2011). The role of individually targeted information to reduce anxiety before colposcopy: a randomised controlled trial. *BJOG*, **118**, 945-50.

Freeman-Wang T, Walker P, Linehan J, et al (2001). Anxiety levels in women attending colposcopy clinics for treatment for cervical intraepithelial neoplasia: a randomised trial of written and video information. *BJOG*, **108**, 482-4.

Galaal K, Bryant A, Deane KH, et al (2011). Interventions for reducing anxiety in women undergoing colposcopy. Cochrane Database Syst Rev, CD006013.

Heinonen A, Tapper AM, Leminen A, et al (2013). Health-related quality of life and perception of anxiety in women with abnormal cervical cytology referred for colposcopy: an observational study. *Eur J Obstet Gynecol Reprod Biol*, **169**, 387-91.

Kola S, Walsh JC (2012). Determinants of pre-procedural state anxiety and negative affect in first-time colposcopy patients: implications for intervention. *Eur J Cancer Care (Engl)*, **21**, 469-76.

Kola S, Walsh JC, Hughes BM, Howard S (2012). Attention focus, trait anxiety and pain perception in patients undergoing colposcopy. *Eur J Pain*, **16**, 890-900.

Kola S, Walsh JC, Hughes BM, Howard S (2013). Matching intra-procedural information with coping style reduces psychophysiological arousal in women undergoing colposcopy. *J Behav Med*, **36**, 401-12.

Ludwick-Rosenthal R, Neufeld RW (1988). Stress management during noxious medical procedures: an evaluative review of outcome studies. *Psychol Bull*, **104**, 326-42.

Mao C (2002). Teaching residents humanistic skills in a colposcopy clinic. *Acad Med*, **77**, 742.

Marteau TM, Walker P, Giles J, Smail M (1990). Anxieties in women undergoing colposcopy. *Br J Obstet Gynaecol*, **97**, 859-61.

Rogstad KE (2002). The psychological impact of abnormal cytology and colposcopy. *BJOG*, **109**, 364-8.

Spielberger CD, Gorsuch RC, Lushene RE (1970). Manual for the state-trait anxiety inventory, Palo Alto: Consulting Psychologists Press.

Swancutt DR, Greenfield SM, Wilson S (2008). Women's colposcopy experience and preferences: a mixed methods study. *BMC Womens Health*, **8**, 2.

Van Leeuwen AW, De Nooijer P, Hop WC (2005). Screening for cervical carcinoma. *Cancer*, **105**, 270-6.

Walsh JC, Curtis R, Mylotte M (2004). Anxiety levels in women attending a colposcopy clinic: a randomised trial of an educational intervention using video colposcopy. *Patient Educ Couns*, **55**, 247-51.

Williams GL, Clarke P, Vellacott KD (2006). Anxieties should not be forgotten when screening relatives of colorectal cancer patients by colonoscopy. *Colorectal Dis*, **8**, 781-4.