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Original article

The Consequences of Preprocedural Anxiety Level on Post Procedural Pain in Women Experienced During Hysterosalpingography

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Abstract

Background and Objective: Hysterosalpingography (HSG) is an invasive fluoroscopic investigation for infertility or recurrent spontaneous abortions. HSG is considered to be a cardinal diagnostic tool for proper assessment of uterine morphology and tubal patency. Due to its invasive mode of evaluation, it is considered to be a stressful and painful procedure. The updated researches show very scarce data regarding this maneuver. In this study, our aim was to investigate women's experience of HSG in terms of anxiety and pain using Beck's Anxiety Inventory (BAI) score and visual analogue scale (VAS) score respectively. ***Material and Methods:*** A cross-sectional prospective study was conducted in the X-Ray department of radiology of a tertiary care hospital in Karachi in 1 year period from 19-11-21 till 19-11-22. The data was collected from patients after taking a verbal consent and evaluating patients during the HSG procedure over a specified period. The sample size for the study was calculated to be 240 patients. The level of anxiety and pain of patients was judged on the basis of Beck Anxiety Inventory score (BAI) and Visual Analogue Score (VAS) respectively. Frequencies and percentages were computed for qualitative variables. Quantitative variables were presented as mean ± SD like age. Effect modifier like age was controlled through stratification. P-value of ≤0.05 was considered as significant. ***Results:*** The level of anxiety of patients was judged on the basis of Beck Anxiety Inventory score. 42.1% patients (n= 86) had nominal anxiety pre procedure, 45.6% patients (n=93) had mild anxiety. Moderate anxiety was noted in 6.4% of patients (n=13) while 5.9% (n=12) patients had severe anxiety. As per our results, patients who had nominal anxiety pre procedure, 83% of them suffered from mild pain and 17% of the patients suffered moderate pain and 0% had severe pain. Those who presented with mild anxiety experienced mild pain in 23% cases, moderate pain in 76% cases and none experienced severe pain. Patients with moderate and severe anxiety suffered severe pain in all (100%) cases. ***Conclusion:*** Anxiety has a crucial role in determining the pain score of the patient and with timely assessment of anxiety score; its management can reduce patient's fear and sufferings. This study will serve as a basis of awareness and modification in pain and stress management for many invasive procedures done in diagnostic radiology.

Keywords: ***Hysterosalpingography, Anxiety, Pain.***

Introduction

Hysterosalpingography (HSG) is considered as a prime diagnostic modality for infertility workup and for assessment of uterine morphology and tubal patency [1,2]. Due to its genuine reliability and cheap cost effectiveness, HSG is most commonly used diagnostic procedure for uterine and fallopian tube abnormalities on comparison with MRI [3]. Due to invasive mode of procedure, more psychological stress and anxiety might act as divine source of post procedural pain than physical factors [4]. Other risk factors include nulliparity, dysmenorrhea, emotional state, infertility type, procedure duration, amount of contrast used, chronic pelvic pain, presence of cystocele, and tubal obstruction [5].

The Beck's Anxiety Inventory (BAI) is a 21-item Likert scale self-reported questionnaire measuring common symptoms of clinical anxiety. The total score can range from 0 to 63. The Grading of anxiety level depends upon the amount of score evaluated: [6]

0-7: minimal level of anxiety.
8-15: mild anxiety.
16-25: moderate anxiety.
26-63: severe anxiety.

Visual Analogue Score (VAS) is commonly used to detect the severity of pain and calculated just after the procedure. The VAS was a 10-cm line scaled from 0 to 10 (0 = no pain, 10 = severe pain).

Material And Methods

A cross-sectional prospective study was conducted in the X-Ray department of radiology of a tertiary care hospital in Karachi in 1 year period from 19-11-21 till 19-11-22. The data was collected from patients after taking a verbal consent and evaluating patients during the HSG procedure over a specified period. The sample size for the study was calculated to be 240 patients. The level of anxiety and pain of patients was judged on the basis of Beck Anxiety Inventory score (BAI) and Visual Analogue Score (VAS) respectively. All the patients arrived in X-ray department for HSG Procedure were included except Pregnant patient, Active pelvic infection, Recent uterine or tubal surgery. After recording the detailed history of the patient and inclusion of the demographic data including the age and

presenting complains was noted. The sample size for the study was calculated to be 204 patients. Patient's data was compiled and analyzed through statistical package for Social Sciences (SPSS) Version 21. Frequencies and percentages were computed for qualitative variables. Quantitative variables were presented as mean ± SD like age. Effect modifier like age was controlled through stratification. P-value of ≤0.05 was considered as significant.

Table 1: Beck anxiety inventory

	Not At All	Mildly but it didn't bother me much.	Moderately - it wasn't pleasant at times	Severely – it bothered me a lot
Numbness or tingling	0	1	2	3
Feeling hot	0	1	2	3
Wobbliness in legs	0	1	2	3
Unable to relax	0	1	2	3
Fear of worst happening	0	1	2	3
Dizzy or lightheaded	0	1	2	3
Heart pounding/racing	0	1	2	3
Unsteady	0	1	2	3
Terrified or afraid	0	1	2	3
Nervous	0	1	2	3
Feeling of choking	0	1	2	3
Hands trembling	0	1	2	3
Shaky / unsteady	0	1	2	3
Fear of losing control	0	1	2	3
Difficulty in breathing	0	1	2	3
Fear of dying	0	1	2	3
Scared	0	1	2	3
Indigestion	0	1	2	3
Faint / lightheaded	0	1	2	3
Face flushed	0	1	2	3
Hot/cold sweats	0	1	2	3
Column Sum				

Scoring **-** Sum each column. Then sum the column totals to achieve a grand score. Write that score here _____ .

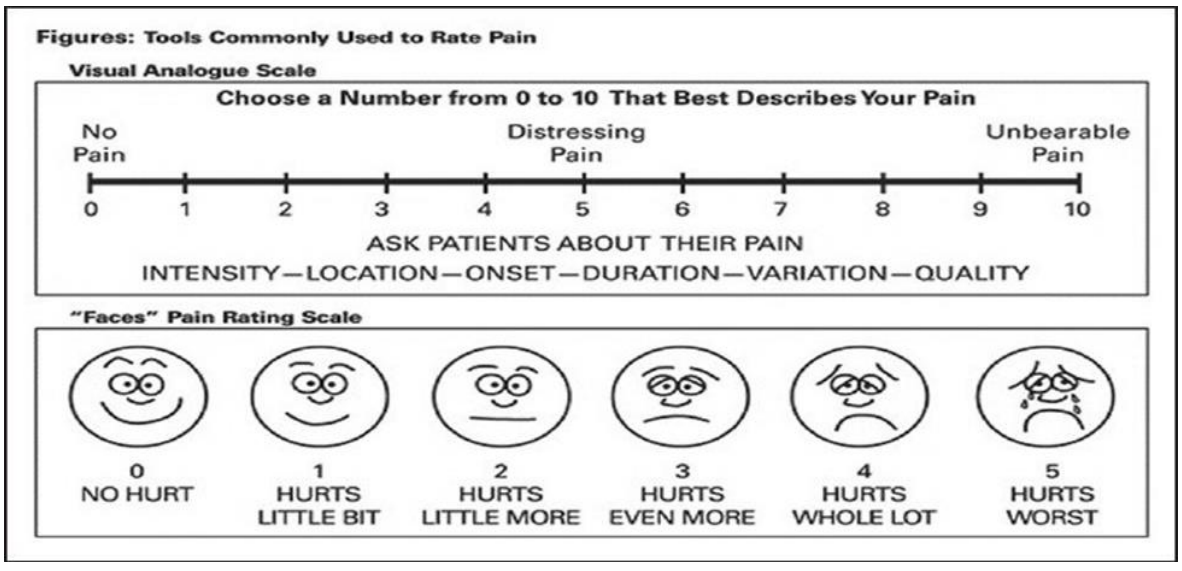

Figure 1: Tools commonly used to rate pain

Results

A total of 204 patients were included in the study. The median age of the patients was 31 years. The mean duration of marriage was 6 years. Of these 204 patients, 65.2% (n=133) of the females were suffering from primary infertility and 34.8 % (n=71) had secondary subfertility. The level of anxiety of patients was judged on the basis of Beck Anxiety Inventory score and about 42.1% patients (n= 86) had nominal anxiety pre procedure, 45.6% (n=93) had mild anxiety. Moderate anxiety was noted in 6.4% of the patient (n=13) while 5.9% (n=12) patients had severe anxiety. As per our result, patients who had nominal anxiety pre procedure, 83% suffered from mild pain and 17% of the patients suffered moderate pain and 0% had severe pain. Those who presented with mild anxiety experienced mild pain in 23% cases, moderate pain in 76% cases and none experienced severe pain. Patients with moderate and severe anxiety suffered severe pain in all (100%) cases. However, none experienced mild or moderate pain.

Table 2: Anxiety level by BAI

Case Processing Summary

		Cases					
		Valid		Missing		Total	
	Anxiety level by BAI	N	Percent	N	Percent	N	Percent
Visual analog scale score	Nominal	86	100.0%	0	0.0%	86	100.0%
	Mild	93	100.0%	0	0.0%	93	100.0%
	Moderate	13	100.0%	0	0.0%	13	100.0%
	Severe	12	100.0%	0	0.0%	12	100.0%

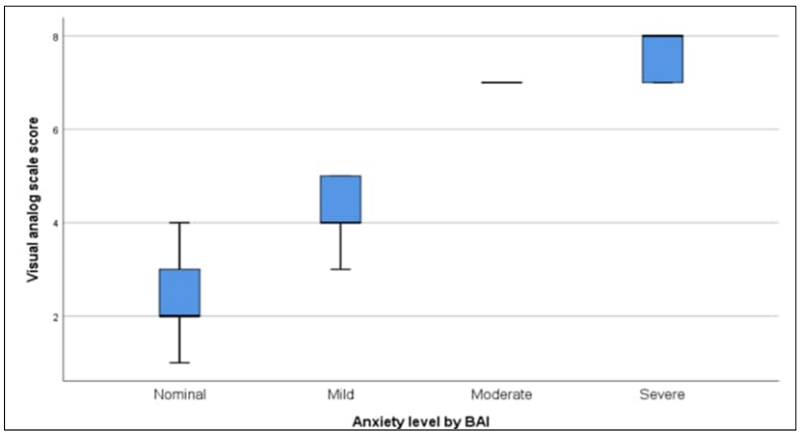

Figure 2: Visual analog scale score

Discussion

Infertility is a biomedical, psychological, cultural and social problem, especially in our cultural setting. Culture plays a very important and major role in infertility in our sub region. In the Western world, infertility is regarded as a medical problem. Our culture sees fertility as a social and cultural occurrence rather than biological. Infertile women are faced with intense family and sociocultural issues. They are blamed for infertility, irrespective of the etiology. This leads to a lot of anxiety, stress, frustration, grief, depression, social stigma and personal insecurities.

The presence of anxiety caused due to activation of the sympathetic nervous system. This activation relays a neural signal through the hypothalamus to stimulate the release of preganglionic acetylcholine, which is a neurotransmitter. Acetylcholine, in turn stimulates the release of epinephrine and norepinephrine, which are catecholamine from the adrenal cortex [7-9].

A great majority of patients undergoing HSG experience pain in some form associated with the procedure. Studies evaluating pain are complicated by the subjective nature of pain; it is difficult to systematically record pain perception in a reliable and reproducible manner [10].

Literature showed that majority of the women undergoing Hysterosalpingography have significant level of anxiety and pain [11-13]. The current study was conducted with the aim that there was a relationship between pre-procedure anxiety levels and post-procedure pain.

A study conducted by Kiridi KE [7] revealed that there was a significant, positive, and strong relationship between pre-procedure anxiety and post-procedure pain. This is in keeping with the report from the study of Tokmak et al. [14] where there was significant positive correlation between the level of pre-procedure anxiety and the level of post-Hysterosalpingography pain perception. Many authors and studies have reported that there was a positive correlation between the level of anxiety and pain perception [15-22].

Apart from the pre-procedure anxiety that is associated with Hysterosalpingography, infertility itself causes a lot of stress. In fact, the risk of depression, anxiety, and distress is high in women being evaluated for infertility [23]. In a previous study, 40.2% of women had anxiety, depression or both just before their first infertility clinic visit [24]. Another research conducted among women being evaluated for infertility reported a 30.8% prevalence rate of psychiatric disorders, most of which was depression [25]. Recent research on the prevalence of psychological features among women on investigation for infertility reported that 25%-60% of them had psychiatric symptoms and that their levels of anxiety and depression were markedly higher than those of their fertile counterparts [26].

In a study, the mean age was 35.8±4.5 years, which is within the reproductive age group. The median age at first childbirth was 22.3-year-old [27]. Most (96.6%) of the women were above the age of 30 years. The plausible reason for this is that, as women advance in age, there is increase in the population with age-related infertility, necessitating evaluation and referral for investigations, which include hysterosalpingography [28].

The results of a study conducted by Kiridi KE7 revealed that the mean anxiety score using the Beck's Anxiety Inventory (BAI) before the procedure was 7.1± 5.4. Anxiety scores ranged from 0 to 21. Total 65.5% participants have minimal level of pre-procedure anxiety level. The mean pain score recorded with the use of the Numerical Rating Pain Scale was 5.2±2.7. Pain perception score ranged between 0 and 9. While 5.5% women felt no pain, 21.3% women felt mild pain, 35.8% felt moderate pain and 37.4% women indicated severe pain following Hysterosalpingography. The pre-procedure anxiety scores showed significant, positive, and strong relationship with post-procedure pain scores, reflected in a correlation coefficient of 0.50 (P= 0.001). The linear relationship between anxiety scores and pain scores was observed. For every unit change in anxiety score, there was an estimated 25.4% change in the pain perception documented by the participants. For participants who had an anxiety score of 0, there was an average pain score of 3.45.

In another study conducted by Tokmak A et al.,[29] A total of 109 infertile women (primary infertility; 70 patients, secondary infertility; 39 patients) were enrolled. Group-I (patients with BAI of ≤25) consisted of 84 patients, and Group-II (BAI > 25) consisted of 25 patients. In Group-I, post procedure VAS score was lower than that of Group-II (5.9 vs. 7.5; p=0.012). Parity was also lower in Group-I (p= 0.042) [29].

In another study, which was conducted on women who undergo HSG patients' knowledge, pain, and anxiety levels were

evaluated. It was determined that women who had HSG procedure were found to have higher levels of knowledge, anxiety and had experienced more pain during the procedure than women who had colposcopy [30,31]. In a randomized controlled trial, pre-procedural training and counselling were given to women who had undergone HSG procedure and it was found that women's anxiety levels were reduced statistically significantly in the consulting group [32].

Deep breathing, being calm was found useful by the women and procedure was defined as a simple and short procedure [30]. For this reason, it is important to ensure that women who are going to have HSG procedure should receive true and reliable information from healthcare professionals. In this way, the adaptation of the patient to the HSG procedure might help preventing the women's prejudice, anxiety and misinformation about the procedure.

One study showed that pain experienced during Hysterosalpingography is multifaceted. The sources of pain are from grasping the cervix, distension of the uterus with contrast medium and peritoneal irritation as well as anxiety [33-35]. The long-term consequences of painful experience include depression, chronic pain and rejection of care. There is also a psychological component to the pain due to fear, anxiety and experience shared by other women [35,36].

The limitation of this study is that it is hospital-based. Therefore, the findings cannot be used to draw general conclusions in the population of infertile women. A multi-centre randomized control trial with a larger sample size will be more representative.

Conclusion

Anxiety has a crucial role in determining the pain score of the patient and with timely assessment of anxiety score; its management can reduce patient's fear and sufferings. This study will serve as a basis of awareness and modification in pain and stress management for many invasive procedures done in diagnostic radiology.

List of abbreviations

Hysterosalpingography (HSG)
Beck's Anxiety Inventory (BAI)
Visual Analogue Score (VAS)

Ethics approval and consent to participate

As per university standard, written ethical approval and written consent has been collected and preserved by the authors.

Conflicts of Interest

There is no conflict of interest regarding the publication of this paper.

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