



Review Article

An analysis of the literature on overcome the pain, anxiety levels of patients during hysterosalpingography procedure

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Abstract

Hysterosalpingography (HSG) is an essential diagnostic method for assessing infertility. However, it often causes considerable discomfort and anxiety, which might discourage patients from following through with the operation and affect the accuracy of the diagnosis. This research review examines several approaches to alleviate pain and anxiety during HSG. The explored approaches encompass pharmaceutical treatments, such as painkillers, topical anesthetics, and non-steroidal anti-inflammatory medications (NSAIDs), as well as non-pharmacological procedures, such as electro-acupuncture, patient education, and counseling. Research suggests that the efficacy of analgesics and topical anesthetics in alleviating discomfort is inconsistent, since several studies have found no substantial advantages compared to placebos. The study emphasizes the significance of using minimally invasive methods, utilizing state-of-the-art technology, and delivering comprehensive patient education to improve comfort and adherence to procedures. Although there have been advancements, further research is needed to create customized pain and anxiety management methods that can enhance the overall patient experience during HSG.

Keywords: Hysterosalpingography, pain management, anxiety reduction, pharmacological interventions, non-pharmacological methods, patient education, acupuncture, topical anesthetics, gynecological procedures.

1. Introduction

The average incidence of infertility among individuals of reproductive age in developed nations is around 12%, with a range of 6.6% to 26.4% (1). Infertility is a medical condition characterized by the failure to achieve pregnancy while participating in regular sexual relations without protection for at least 12 consecutive months (2). Female fertility can be influenced by several illnesses affecting the reproductive tract, cervix, ovarian tissue, fallopian tubes, endometrium, and peritoneum. Abnormalities in the fallopian tubes contribute to around 30% to 40% of female infertility cases (3). Women need not be apprehensive about experiencing discomfort during tests conducted to assess the condition of the cavity in their uterus and tubal patency (4).

Pain is a disagreeable sensation or emotion that serves as the body's innate system to alert about potential harm or injury to cells or tissues. The presence of pain may trigger an instinctive response to retreat immediately, in order to evade the painful encounter and the anticipated damage. Hysterosalpingography (HSG) is widely known for its reputation of being a test that causes significant discomfort (5). Hysterosalpingography (HSG) is a significant diagnostic test used to evaluate infertility, however it is frequently linked to discomfort and unease.

Hysterosalpingography (HSG) has revolutionized the treatment of common gynecologic issues by offering a less intrusive method. This test can be utilized to diagnose a variety of uterine conditions, such as congenital anomalies affecting the uterus and tubes, submucous fibroids, synechiae (which are adhesions between the uterine or tube walls), adenomyosis (characterized by the expansion of the liner of the endometrium deep into the underlying

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myometrium or muscular layer), and polyps. (6). The broad use of this crucial technology can be attributed to enhanced physician training, utilization of smaller diameter hysteroscopes, and increasing focus on office-based treatments. The most significant barrier to the general adoption of this procedure in an outpatient environment is the significant pain and suffering experienced by patients, resulting in failure rates as high as 84% (7).

2. Gynecological treatments and the sense of pain

Although several women adhere to regular visits with their gynecologists, there is a unanimous consensus among them that gynecological checks are necessary. Szymoniak et al. (8). carried out a survey of 100 women to get their perspectives on gynecological examinations. Seventy percent of the individuals had feelings of embarrassment and tension. Surprisingly, the most humiliating occurrences were getting onto the gynecological chair (46%) and getting ready for the test (28%), and the actual gynecological examination was identifies as the least uncomfortable aspect (20%). Speculum insertion is the standard first step for all gynecological operations. The individuals in the study conducted by Szymoniak et al. (8). expressed a preference for doctors who exhibited pleasant demeanor, decent temperament, and effective communication skills.

The presence of fear regarding discomfort during speculum insertion has been demonstrated to hinder patient adherence to regular cervical cytology screening examinations (9). Numerous techniques have been explored to improve patient comfort and lessen discomfort and anxiety during gynecological inspections. These include exploring various types of speculum, adjusting patients posture, allowing patients to self-insert the speculum, and using lubricating gel or water (10). A study was conducted to examine the efficacy of using lubricating gel against water for reducing discomfort during vaginal speculum insertion. The 2012 randomized controlled trial (RCT) found that the use of lubricating gel when inserting a speculum resulted in a substantial reduction of pain feeling by 0.75 cm on a visual analog pain scale. Nevertheless, it is crucial to bear in mind that although the statistical difference was significant, any change less than 0.9 cm is not deemed clinically relevant. Additional randomized controlled trials (RCTs) are required to provide clarity on the very straightforward, yet highly significant matter of discomfort associated with speculum insertion (11).

3. Pain aversion

Hysterosalpingography (HSG) is a commonly employed first diagnostic method for assessing female infertility. During the first use of HSG, using inflexible metal cannulae and contrast medium containing oil or ions, a significant number of patients reported experiencing moderate to severe discomfort. HSG, thus, acquired the reputation of being an agonizing examination, thereby intensifying the apprehension of pain associated with this particular technique. The primary technological advancements in recent years have focused on minimizing exposure to radiation in patients, alleviating pain and suffering, and optimizing technological effectiveness (12). To accomplish these objectives, less ionic contrast solutions and disposable thin catheters have been devised as a replacement for the conventional metal cannulae.

Sohail (13) examined the factors that influenced the initial pain threshold of 250 women who underwent HSG procedures conducted by an identical radiologist. Concern was strongly linked to unbearable pain during the operation, but a calm mental state and motivation for oneself were linked to high tolerance of pain. A study was conducted on 102 individuals having periodontal or implant surgery to examine the influence of anxiety on pain perception. people who had high levels of anxiety before treatment claimed that the procedure was more unpleasant compared to people with lesser anxiety levels (13).

4. Types of medications in pain relief

1. Pain killer

Different mechanisms are used by painkillers, such as opiates acetaminophen, localized anesthetic, and anti-prostaglandins, to reduce pain. By reducing prostaglandin synthesis, inhibiting pain impulses inside the brain, preventing signals related to pain from the spinal cord from reaching the brain, and/or detecting nerve pain signals, they mostly act in the periphery. The subject of interest is to determine if women should be given analgesic medication before having HSG procedures done.

The most recent substantial Randomized Controlled Trials (RCTs) failed to identify a substantial advantage of different pharmacological approaches in reducing pain during these procedures (14). A systematic review conducted in 2007 by Cochrane analyzed eight randomized controlled trials (RCTs) that included a total of 570 women to evaluate pain

reduction for hysterosalpingography (HSG). In summary, the conclusion was that there was no substantial evidence supporting the use of any analgesic above a placebo for pain reduction during HSG. Four randomized controlled trials (with a total of 270 participants) provided data supporting the effectiveness of HSG in providing pain relief lasting longer than 30 minutes. They suggested that future randomized controlled trials (RCTs) should investigate the potential benefits of non-steroidal anti-inflammatory drugs and intrauterine anesthesia in the context of HSG (hysterosalpingography) procedures. A comprehensive investigation conducted in 2011 concluded that there is no positive impact of any pharmacological treatments in alleviating pain during HSG (15).

2. Effect of Topical Analgesics

Liberty et. Al (16) assesses the effectiveness of administering lidocaine 25 mg-prilocaine cream topically on the uterine cervix to alleviate discomfort during hysterosalpingography (HSG) and found that applying EMLA 5% cream directly to the uterine cervix prior to doing a Hysterosalpingogram (HSG) effectively decreased the pain experienced during the operation. A randomized, controlled trial was conducted at Suleyman Demirel University to determine the effectiveness of intrauterine lidocaine instillation in reducing patient discomfort during saline solution infusion sonohysterography (SIS) (17). The study involved 156 women who underwent SIS and compared pain intensity during, immediately after, and 20 minutes after the procedure. The results indicated that there were no statistically significant variations among the study group and the control group in terms of average age, number of previous pregnancies, past history of cervix surgery, presence of chronic pelvic discomfort, previous cauterization procedures, level of higher education, socioeconomic standing, menopausal situation, amount of the saline solution applied, usage of a tenaculum, and reason for undergoing saline infusion sonohysterography (SIS). The study found that intrauterine lidocaine is beneficial in reducing discomfort in parous women conducting SIS. (17).

The study conducted by Gupta et.al. (18) conducted a comparative study to assess the efficacy of both naproxen and intrauterine lignocaine in providing discomfort mitigation throughout hysterosalpingography (HSG) in women. The results showed no significant difference in pain scores between the two groups. The study concluded that intrauterine lignocaine was no more effective than oral

naproxen for pain relief during HSG. The study conducted by Chauhan et al. (19) aimed to determine the role of intracervical block as a pain relief modality for Hysterosalpingography (HSG), a procedure used to evaluate tubal factors in infertility. The study involved 100 women from a tertiary care centre in India, divided into two groups. The study group received intracervical block along with premedication, while the control group received premedication alone. The pain scores were analyzed using independent t tests. Results showed a reduction in pain from the placement of the tenaculum till the end of the procedure. Pain remained lower during the most painful steps, such as traction of the cervix and dye insertion. The study concluded that intracervical block could be offered to all women undergoing HSG to make the procedure less painful and improve compliance. (19)

3. Electro-acupuncture treatment

A study involving 107 patients undergoing hysterosalpingography (HSG) found that acupuncture can reduce pain and anxiety. The acupuncture group received electro-acupuncture 20 minutes before the procedure, while the intramuscular diclofenac sodium group received 75 mg intramuscular injection 30 minutes before the procedure. No analgesics were administered to the control group (20). The VAS scores were similar in both groups, but significantly lower than in the control group. The STAI-S scores were similar in all groups, but the acupuncture group had significantly lower STAI-S values at preoperative 5 minutes, postoperative 5 minutes, and postoperative 30 minutes. The study concluded that acupuncture has similar effects on pain reduction as other analgesics and reduces anxiety, making it suitable for use in HSG clinics.

Research by Unlu et al. (21) compared four analgesic methods during HSG, highlighting the effectiveness of combining NSAID with paracervical block or analgesic cream. The study emphasized that the instillation of liquids during HSG was the most painful step, with significant pain reduction observed in groups receiving paracervical block or analgesic cream.

A randomized controlled experiment was conducted to assess the efficacy of education and counseling as an acute intervention in mitigating symptoms of distress in women having HSG. The investigation revealed a notable disparity in anxiety and depression symptom ratings among the intervention and control groups (22). The results align with prior research, which shown that sufficient information and

counseling significantly decreased anxiety levels. Nevertheless, the anxiety levels at the beginning were elevated in patients prior to endarterectomy in comparison to women receiving HSG. Furthermore, a correlation was seen between educational attainment and the presence of symptoms associated with anxiety and depression. Specifically, those with greater levels of education had lower levels of these symptoms. The control group was not provided with any form of instruction or counselling, which enabled a more direct assessment of the effects of the treatment. The study also discovered that the intervention group did not see any decrease in pain scores, indicating the educational process and consultations alone may not be effective enough in managing pain levels. The study has some drawbacks, such as the lack of assuring fairness in anxiety and depression ratings across different groups from the beginning, the failure to uncover factors that might predict how individuals respond to therapy, and the provision of only one education and counseling session. Additional study of extended duration and economically feasible analysis is necessary to provide a more comprehensive understanding of the impact of information and counseling on reducing anxiety in women having HSG.

4. Conclusion:

Although women may experience embarrassment and discomfort during gynecological examinations, they need not be concerned about experiencing pain during HSG. To counter the negative perception of a painful examination, it is imperative for all practitioners to adopt a gentler and more contemporary technical methodology. Continuous medical education can be used to reset patients' expectations for a pain-free surgery by enhancing our skill. Patients may experience pressure and discomfort, as anticipated, and a few individuals may still experience slight pain. However, in 99% of instances, the level of pain should not exceed this. Regardless of whether you are a gynecologist or a radiologist, using refined methods such as utilizing slender and flexible catheters and employing delicate motions, inflating the balloon inside the cervix and gradually administering warm medium, can effectively render SHG, HyCoSy, and HSG treatments almost devoid of discomfort (4).

In conclusion, although there have been breakthroughs achieved in the management of pain during HSG, such as the utilization of certain analgesic approaches and contrast agents, there is still space for improvement in the way that

patient discomfort and anxiety levels are addressed. In the future, research may concentrate on tailored techniques, psychological therapies, or innovative analgesic procedures in order to improve the patient's experience while undergoing HSG.

Conflict of interest: Author declares that there is no conflict of interest.

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