Comparison of warm and cold contrast media for hysterosalpingography: a prospective, randomized study

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Objective: To compare the use of warm medium and cold medium for alleviating pain and side effects during hysterosalpingography (HSG).
Design: Prospective randomized study.
Setting: University hospital.
Patient(s): Two hundred infertile women who needed HSG were recruited from January 2010 to June 2011. The exclusion criteria were acute low reproductive duct infection, known hypersensitivity to iodine, genital bleeding, or malignancy.
Intervention(s): Subjects were randomized to undergo HSG using a medium prewarmed to 37°C or a medium at room temperature.
Main Outcome Measure(s): Incidence of vasovagal episodes and visual analog scale (VAS) pain scores during HSG.
Result(s): Patients' VAS pain scores during HSG were significantly lower in the warm media group initially but showed no statistical difference at 30 minutes after injection. Medium temperature showed a linear association with VAS score. The total number of vasovagal episodes was higher in the cold medium group.
Conclusion(s): Warm contrast medium alleviates the pain associated with HSG and decreases the incidence of vasovagal episodes during HSG.
Clinical Trials Registration Number: NCT01339338. (Fertil Steril® 2012;97:1405–9. ©2012 by American Society for Reproductive Medicine.)
Key Words: Hysterosalpingography, contrast media, pain

As an essential step of an infertility work-up, hysterosalpingography (HSG) has remained widely used in many countries since it was first described in 1914 (1). HSG is considered to be a noninvasive and safe procedure; however, it still has some adverse effects. Lower abdominal pain and vasovagal episodes are mainly acute reactions to the contrast media. Approximately 16%–54% of patients undergoing HSG experience vasovagal symptoms, which include nausea, vomiting, sweating, weakness, and even bradycardia (2, 3). Many techniques have been developed to reduce the frequency and severity of the adverse reactions associated with HSG, including prophylactic analgesia, pretreatment with corticosteroids, and the use of nonionic contrast media (4–7). The benefits of these techniques are disputed; for example, a recent Cochrane review (8) reported that the use of pain medications during HSG was not associated with a decrease in patients' pain levels.

Another technique, the use of warm instruments and solutions, has been explored and has been shown to increase patient comfort in a number of arenas. Prewarming hands and instruments before physical examination and local active warming during acute pelvic pain are both associated with increased patient comfort (9). Experiences from peritoneal dialysis (10) and laparoscopy (11) indicate that warm dialysis solution or air insufflations can reduce the severity of pain. A randomized study (12) on sonohysterography (SHG), another technique for examining tubal and uterine cavity pathologies, suggested that warming echoic contrast media to body temperature is a simple and effective intervention for reducing discomfort during the exam. Owing to the differences in SHG and HSG, namely the quantity and content of the media used, it is unknown whether this intervention would also have an impact on the pain levels experienced during HSG. The aim of this study was to compare the pain levels and incidence of vasovagal events using warm medium or cold medium for HSG.

MATERIALS AND METHODS

Study Design and Patients

This was a randomized study conducted from January 2010 to June 2011 at the Taizhou Hospitals of Zhejiang Province and the Enze Women's Hospital, which are two major reproductive medical centers in the Taizhou District of China. Women who visited the hospital for HSG were recruited during the study periods. Exclusion criteria were: acute low reproductive duct infection, a known hypersensitivity to iodine, genital

Received November 14, 2011; revised February 26, 2012; accepted February 28, 2012; published online March 27, 2012.
Y.-Y.Z. has nothing to disclose. Y.-Z.M. has nothing to disclose. W.-L.W. has nothing to disclose.
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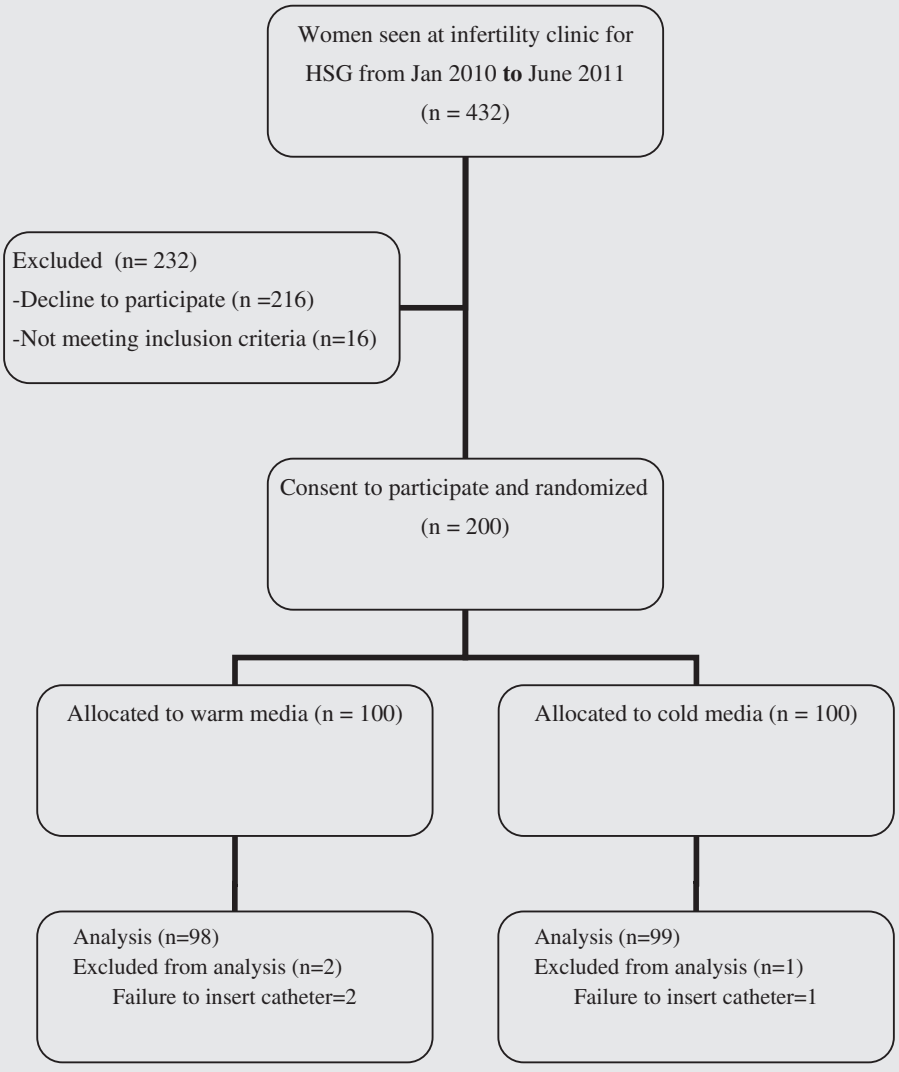
Fertility and Sterility® Vol. 97, No. 6, June 2012 0015-0282/$36.00

doi:10.1016/j.fertnstert.2012.02.039

FIGURE 1



Correlation between the medium temperature and pain score. Pearson correlation −0.470, which was significant at the .01 level (two tailed). VAS = visual analog scale.

Zhu. Warm contrast media for HSG. Fertil Steril 2012.

bleeding, or malignancy. After signing a consent form, the subjects were randomized into two groups by a computer-generated allocation sequence. The randomization was performed in each hospital. Subjects allocated to the experimental arm underwent HSG using a contrast medium warmed in a water bath at 37°C, whereas cold medium at room temperature was used for HSG in the controlled arm of the trial. The Institutional Ethics and Review Committee for Reproductive Medicine approved this study.

Measures

Each subject answered a questionnaire requesting age, history of transcervical surgery, and average pain during menstrual period. HSG was scheduled during the follicular phase of the menstrual cycle. One team of radiologists performed all of the HSGs using a fluoroscopy system (Axiom Iconos R200; Siemens, Germany). HSG was performed according to Baramki's description (13). Prophylactic antibiotic and spasmolytic drugs were not used. After the insertion of a balloon catheter, the nurse injected warm or cold nonionic water-soluble contrast medium (Iopamiro 300; Bracoo, Shanghai Sine Pharmaceutical Corp.) according the randomization assignment.

The contrast medium was stored in the control room where the air conditioner was turned off. The warm medium was incubated at 37°C in digitally controlled water baths. The medium temperature was confirmed using an electronic thermometer before injection, and the medium was injected immediately after it was aspirated from ampules. The researcher who recorded the pain score and side effects was blinded to the group assignments of the patients. A 10-point visual analog scale (VAS) was used to measure pain. Patients