Feasibility of “smart” hysteroscopy
Ferrero S, Simoncini F, Scala C, Leone Roberti Maggiore U, Venturini PL, Casabona F
Department of Obstetrics and Gynecology, RCCS AOU San Martino - IST, University of Genoa, Italy

Abstract

Objective: To compare the use of a portable digital camera modified hysteroscope system (mHSC) with a traditional hysteroscope system (tHSC) in diagnostic procedures.

Design: Prospective comparative study.

Setting: Academic hysteroscopy clinic.

Patients: Pre- and post-menopausal women.

Interventions: Two consultants and two registrars performed hysteroscopies by using the two systems. In the mHSC group, a digital mirrorless camera (Figure 1) was connected with a Betocchi hysteroscope (2.9 mm optical system and 5 mm sheath; Karl Storz, Germany) by using a C-mount optical coupler; a portable handheld cold light source was used (T5007.6., Zhejiang Tiansong Medical Instrument, China). The procedure was visualized on an iPad (Apple, Cupertino, CA, USA) connected to the digital camera by wireless (Figure 2). In the tHSce group, the traditional hysteroscopic equipment and the same hysteroscope were used. Primary endpoints were time to perform the hysteroscopy and number of failed procedures. Secondary endpoints were discomfort perceived by the patients and difficulty experienced by the physicians in performing the procedure. The videos of the procedures were recorded and blindly reviewed by two consultants who were asked to judge the quality of the image (Video 1 and Video 2).

Figure 1. The digital mirrorless camera used in the mHSC group (Sony Alpha 5000)

Figure 2. In the mHSC group, the procedure was visualized on an iPad (panel A) connected to the digital camera by wireless (Panel B)
Patients accepting to undergo the hysteroscopy by using the mHSC were included in the experimental group. Patients refusing to undergo the procedure by using the mHSC were used as controls. The study was approved by the local ethics committee. Each participating patient signed a written informed consent for the procedure.

**Measurements & Main Results:**
140 patients were included in the study (32.9% were menopausal); 70 hysteroscopies were performed with the mHSC and 70 with the tHSC. There was no significant difference between the two study groups in the time required to visualize the uterine cervix by vaginoscopic approach (p = 0.831), to enter the uterine cavity (p = 0.361), to examine the uterine cavity (p = 0.852) and in the number of failed procedures (p = 0.310).

The patients experienced similar discomfort in the two groups (p = 0.456). Both registrars and consultants reported a similar difficulty in performing hysteroscopies by using the two systems (p = 0.203 and p = 0.489, respectively). There was no significant difference in the quality of the images between mHSC and tHSC (p = 0.775).

**Conclusions:**
The current study shows the feasibility of hysteroscopy by using the mHSC. The mHSC is easily portable and it is less expensive than the tHSC. This system may allow to perform hysteroscopies in low resource settings.