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## ‘One-stop shop’ ultrasound evaluation of an infertile patient: doing less is no longer an option

Sir,

We read the article by van Welie *et al.* (2022) with great interest. The authors conducted a multicenter, prospective, comparative study with a randomized design on 1026 women who underwent hysterosalpingo-foam sonography (HyFoSy) and hysterosalpingography (HSG).

Their findings show that using either HyFoSy or HSG in infertile women leads to similar pregnancy outcomes, although HyFoSy is associated with significantly less pain. Van Welie *et al.* (2022) thus conclude that HyFoSy should be the first-choice tubal patency test during fertility work-ups.

However, their study, although highly important, misses a number of crucial steps. The assessment of the uterine cavity, tubal patency

and the ovaries constitutes a key component of female infertility work-ups. The benefits of a comprehensive ‘one-stop shop’ concept for the evaluation of the genital tract in infertile patients was initially suggested by Kelly *et al.* (2001) and reiterated more recently by Groszmann and Benacerraf (2016). They also stressed the value of a single comprehensive ultrasound (US) examination in a sequence composed of a two-dimensional (2D), a three-dimensional (3D) US and a Doppler, followed by sonohysterography to evaluate the uterine cavity, and a hysterosalpingocontrast sonography to assess tubal patency.

In our hospital clinic, our ‘one-stop shop’ procedure consists of a comprehensive US evaluation of the female pelvis that incorporates 4 different steps in one exam. The first step is the initial 2D US scan of the pelvic organs. This yields information not only about the pelvic anatomy, uterus and ovaries but also identifies pelvic pathologies including endometriosis, adenomyosis, hydrosalpinx (Melcer *et al.*, 2022a). The second step is the 3D US, given that there is a higher prevalence of congenital uterine anomalies in infertile women than in the general population (Chan *et al.*, 2011). Because the structure of the uterus impacts successful implantation, any congenital anomalies that could be associated with impaired reproductive performance need to be identified. The third step involves saline or lidocaine (Melcer *et al.*, 2021a) infusion sonography to achieve distension and allow visualization of the uterine cavity. During the exam, the hyper-echogenic foam (HyFoSy) can be visualized as it moves from the uterine cavity, then along the fallopian tubes into the peritoneal cavity. Unfortunately, the uterine cavity cannot be fully assessed with hyperechogenic contrasts, because they mask the identification of hyperechoic intracavitary lesions. This is why saline infusion sonography is now considered the gold standard equivalent of hysteroscopy for the detection of intrauterine abnormalities (Seshadri *et al.*, 2015). This highly sensitive and specific test can diagnose uterine polyps, submucous myomas, uterine anomalies and intrauterine adhesions and be used to screen for infertile patients (Seshadri *et al.*, 2015). The fourth step is the administration of HyFoSy to evaluate tubal patency (Melcer *et al.*, 2022a,b). Research has indicated that hyper-echogenic foam is an accurate, safe tubal patency technique and a suitable alternative to HSG (Exalto and Emanuel, 2019). Our recent systematic review and meta-analysis confirmed that HyFoSy can accurately diagnose tubal occlusion and performs similarly to standard tests. The combined sensitivity and specificity estimates were 0.99 (95% CI: 0.89–0.99) and 0.91 (95% CI: 0.53–0.98), respectively, with a positive and negative likelihood ratio of 11.5 (95% CI 1.5–87.5) and 0.006 (95% CI 0.0003–0.12), respectively. The diagnostic odds ratio was 1931.008 (95% CI 69.7–53460.8) (Melcer *et al.*, 2021b).

Thus overall, although van Welie *et al.* (2022) should be congratulated for their findings, their study needs to be seen as just one part of the comprehensive ‘one-stop shop’ concept for the evaluation of the genital tract of infertile patients. Given its proven advantages, we recommend incorporating this ‘4 step evaluation’ into routine female infertility work-ups. Doing less is no longer an option.

## Conflict of interest

None.


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## Reply: ‘One-stop shop’ ultrasound evaluation of an infertile patient: doing less is no longer an option

Sir,

We thank Dr Melcer and Dr Maymon for their interest in our article. Dr Melcer and Dr Maymon comment that our study results need to be seen as just one part of the comprehensive ‘one-stop shop’ fertility work-up in infertile couples (Melcer and Maymon, 2022). We agree that hysterosalpingo-foam sonography (HyFoSy) is not the only part of the work-up. Indeed, other features, such as uterine polyps, submucous myomas, uterine anomalies and intrauterine adhesions can also be visualized, although their prognostic and therapeutic impact is largely unclear.

We want to stress that our study does not take into account the direct therapeutic effect of tubal flushing. Recent studies showed a fertility-enhancing effect of tubal flushing during hysterosalpingography with oil-based contrast, resulting in higher pregnancy and live birth rates (Dreyer et al., 2017; Fang et al., 2018; Wang et al., 2019; Wang et al., 2020). Direct therapeutic effects of tubal flushing using HyFoSy versus other types of contrast are still to be assessed.

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## Conflict of interest

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