Human Reproduction Open, pp. 1, 2020
doi:10.1093/hropen/hoaa030

human reproduction open

LETTER TO EDITOR

Letter: Higher reported rates of intravasation of oil-soluble contrast media—there may be a silver lining

Sir,

The recently published article reporting results of a survey on complications after hysterosalpingography (HSG) with oil-soluble contrast media (OSCM) versus water-soluble contrast media (WSCM) found an intravasation rate of 4.8% with OSCM and 1.3% with WSCM (Roest *et al.*, 2020). This result is consistent with meta-analysis (Wang *et al.*, 2019) and our local experience of an intravasation rate of 4.2% in 769 OSCM (Lipiodol) HSG patients (Peart *et al.*, 2019). However, intravasation is more readily detected when using OSCM and the apparently lower rate of intravasation of WSCM is likely attributable to a lower rate of detection.

While the factors predisposing to intravasation remain unclear, there is generally considered to be an increased risk of intravasation in patients with a history of recent uterine interventions, in the early follicular and late luteal phase, with tubal obstruction or with the use of high injection pressures. Other possible predisposing factors, including menometrorrhagia, secondary infertility, endometriosis and Mullerian anomalies are also cited (Dusak *et al.*, 2013). These factors would not be expected to differ between patients undergoing an HSG with OSCM or WSCM, and the intravasation rate is expected to be independent of the contrast agent used.

The most commonly used OSCM is Lipiodol, which has an iodine concentration of 480 mg/ml compared with 300–350 mg/ml for commonly used WSCM, representing a 35–60% greater iodine concentration in OSCM. This results in greater opacity of OSCM compared with WSCM, with enhanced visibility of small amounts of contrast (Lindequist *et al.*, 1991). In addition, the viscosity of Lipiodol is at least 2.5 times that of WSCM (Lindequist *et al.*, 1991) and transit of any Lipiodol in small vessels is likely to be slower than that of WSCM.

Thus, intravasation of WSCM is less readily detected than intravasation of OSCM, due to the physical and chemical properties of OSCM. It is undisputed that the rates of detected intravasation of OSCM are greater than detected intravasation of WSCM. However, it is important to distinguish between rates of detected intravasation and rates of actual intravasation, with the latter being more difficult to detect. It is not clear whether the true intravasation rates for OSCM and WSCM differ significantly and the reported rates of intravasation do not support the quoted conclusion that the risk of intravasation is higher with the use of OSCM compared with WSCM.

The risk of oil embolism as a result of intravasation of OSCM is a reasonable concern, and a belief that intravasation is more common with the use of OSCM may discourage the uptake of OSCM HSG for tubal flushing and assessment of tubal patency, despite the associated fertility enhancement (Dreyer *et al.*, 2017; Wang *et al.*, 2019). Importantly, there have been no sequelae of intravasation of OSCM reported in the recent literature, likely due to the ready detection of early myometrial intravasation on fluoroscopy and prompt termination of the procedure (Roest *et al.*, 2020). Rather than being a cause for concern, the higher rate of detection of intravasation of OSCM is reassuring and reflects early detection of intravasation, with a reduced likelihood of oil embolism or other complication of intravasation.

Conflict of interest

Dr J.P. reports grants, personal fees and other from Guerbet, outside the submitted work.

References

Dreyer K, van Rijswijk J, Mijatovic V, Goddijn M, Verhoeve HR, van Rooij IAJ, Hoek A, Bourdrez P, Nap AW, Rijnsaardt-Lukassen HGM *et al*. Oil-based or water-based contrast for hysterosalpingography in infertile women. *N Engl J Med* 2017;**376**:2043–2052.

Dusak A, Soydinc H, Onder H, Ekinci F, Goruk N, Hamidi C, Bilici A. Venous intravasation as a complication and potential pitfall during hysterosalpingography: re-emerging study with a novel classification. *J Clin Imaging Sci* 2013;**3**:67.

Lindequist S, Justesen P, Larsen C, Rasmussen F. Diagnostic quality and complications of hysterosalpingography: oil- versus water-soluble contrast media—a randomized prospective study. *Radiology* 1991;**179**:69–74.

Peart J, Sim R, Johnson N, Hadden W. Lipiodol HSG—back to the future. *J Med Imaging Radiat Oncol* 2019;**63**(S1):25–26.

Roest I, van Welie N, Mijatovic V, Dreyer K, Bongers M, Koks C, Mol BW. Complications after hysterosalpingography with oil- or water-based contrast: results of a nationwide survey. *Hum Reprod Open* 2020:1–5. doi: 10.1093/hropen/hoz045

Wang R, van Welie N, van Rijswijk J, Johnson NP, Norman RJ, Dreyer K, Mijatovic V, Mol BW. Effectiveness on fertility outcome of tubal flushing with different contrast media: systematic review and network meta-analysis. *Ultrasound Obstetr Gynecol* 2019;**54**:172–181.

Jane Peart*
Auckland Radiology Group, Auckland 1023, New Zealand

*Correspondence address. Auckland Radiology Group, Auckland 1023, New Zealand. E-mail: jane.peart@akradiology.co.nz
http://orcid.org/0000-0002-2481-0134
doi:10.1093/hropen/hoaa030