Published in final edited form as:

J Minim Invasive Gynecol. 2017 February ; 24(2): 305–308. doi:10.1016/j.jmig.2016.10.019.

Improving Rates of Post-Essure Hysterosalpingography in an Urban Population Using Electronic Tracking Reminders

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Abstract

Study Objective—To demonstrate the efficacy of electronic reminders for follow up hysterosalpingography after Essure hysteroscopic sterilization in an urban, tertiary-care hospital obstetrics and gynecology practice

Design—Retrospective cohort

Setting—University-affiliated, urban, tertiary-care teaching hospital obstetrics and gynecology practice.

Patients—Two hundred and fifty patients underwent Essure hysteroscopic sterilization between June 2011 and July 2014.

Intervention—Implementation of electronic reminders for the office staff

Measurements and Main Results—Two hundred and fifty of 259 (96.5%) patients underwent Essure hysteroscopic sterilization and successful placement of coils into bilateral Fallopian tubes. Of the 250 patients, 135 (54%) returned for hysterosalpingogram three months post-Essure as advised at time of procedure. The use of electronic reminders prompted another 45 (18%) patients to return for hysterosalpingogram, improving the total post-Essure follow-up rate to 72%.

Conclusion—Electronic reminders for the office staff of an urban, tertiary care hospital obstetrics and gynecology practice is an effective method for improving the rate of post-Essure hysterosalpingography.

Precis

Utilization of electronic reminders is an effective and affordable method for improving the rate of post-Essure hysterosalpingography.

Keywords

electronic medical record

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Conflicts of Interest – The authors declare they have no conflicts of interest.

Female sterilization is the second most common form of contraception in the United States. In 2002, the FDA approved Essure® (Bayer Healthcare, Whippany, NJ, USA) for hysteroscopic female sterilization, which involves nitinol (a nickel titanium alloy) coils inserted into the proximal Fallopian tubes hysteroscopically. The polyethylene fibers within the inner coils induce fibrosis of the Fallopian tubes, ultimately leading to tubal occlusion. A hysterosalpingogram (HSG) is required three months after the procedure to assess proper positioning of the coils as well as tubal occlusion. Only after this confirmatory test can patients rely on Essure for contraception. In studies of contraceptive failure with Essure, 35% of 508 unplanned pregnancies occurred in patients who did not return for post-procedure confirmatory HSG (1,2,11).

The percentage of patients who return for 3-month HSG follow-up is lacking, ranging from 12.7% (5) to 89.9% (3). The adherence rate is influenced by various characteristics of the patient population, with the lowest rates found in low-income populations (3–10). Previous studies have identified protocols and interventions for increasing the rate of HSG follow-up, by using electronic reminders through the existing electronic medical record (3), a dedicated nurse or resident to remind patients (4), and a post-Essure HSG consent form signed prior to Essure (7). While a previous study demonstrated improvement in HSG test adherence after implementation of electronic reminders, this improvement was isolated to the subgroup seen at the residents-run clinic (n=122). The overall study (n=211) and the patients in the faculty-run clinic (n=89) did not show a statistically significant improvement in adherence after electronic reminders were put in place (3).

The primary objective of this study is to show that the use of electronic reminders in an urban, tertiary-care hospital is effective for increasing the rate of HSG follow-up after Essure hysteroscopic sterilization.

Materials and Methods

This is a retrospective cohort study of 250 of 259 (96.5%) patients who underwent Essure hysteroscopic sterilization from June 1, 2011 to July 31, 2014. Institutional review board approval was obtained from Metrohealth Medical Center, Cleveland, OH where all patients were seen at the faculty obstetrics and gynecology practice. As part of the pre-procedure counseling, all patients were educated on the need for post-procedure confirmatory HSG. They were also offered interim contraception between procedure and the confirmatory HSG. All procedures were performed by attending physicians or by residents under direct supervision of attending physicians depending on resident availability. Procedures were performed in the office under local anesthesia or in the operating room under general anesthesia, based on individual physician judgment regarding clinical characteristics, patient preference, or insurance guidelines. The operative reports included information on successful placement of bilateral coils and the chosen method of interim contraception.

Patient information was identified from billing records, using CPT codes 58565 (hysteroscopy, surgical; with bilateral fallopian tube cannulation to induce occlusion by placement of permanent implants) and 58340 (hysterosalpingography). Patient demographic

data were collected and Chi-square tests were performed to determine association between patient characteristics and HSG adherence.

There were eleven attending physicians in this practice who performed Essure hysteroscopic sterilizations during the study period. The attending of record was ultimately responsible for patient follow-up. Information was collected on each provider's method of tracking patients and use of electronic reminders. HSG follow-up rates were calculated for the entire practice and also for each provider based on use of electronic reminders. No attending physicians who performed Essure hysteroscopic sterilizations were excluded from the study.

Most of the providers in this practice used a feature of Epic (Madison, WI), the existing electronic medical record system, to create electronic reminders. After the Essure procedure was successfully completed, providers manually set up reminders for themselves and/or their staff postdated three months from the date of the procedure at the time when patients were due to return for 3 month follow up HSG. If at that time, the patient had not completed or had not yet scheduled an HSG, the patient was first contacted by telephone or electronic portal message (if available). If the patient was not reached by telephone or electronic portal message, a certified letter was sent to the patient to arrange for the follow-up HSG.

Results

Two hundred and fifty of 259 attempted Essure procedures (96.5%) were successful in the bilateral placement of coils. One hundred and thirty five of 250 patients (54%) had completed HSG follow-up three months after Essure hysteroscopic sterilization. Through the use of electronic reminders, those who did not complete HSG at three months were identified and contacted. As a result, an additional 45 patients completed the HSG, and the total rate of HSG follow-up was 72% (180/250).

Table 1 illustrates the demographics and characteristics of the study population. The mean age of all patients who attempted Essure hysteroscopic sterilization was 32.2 years. The mean gravidity was 4.2 and mean parity was 3.1. Table 2 displays the rate of HSG follow-up by provider (A–K). Each provider performed between 2 and 72 Essure hysteroscopic sterilizations during the study period. Of note, providers *E* and *I* did not report routine use of electronic reminders, whereas all other providers systematically used an electronic reminder to remind staff to contact patients for follow-up HSG. In total, of the 250 patients who had undergone successful placement of bilateral coils, nine patients had no HSG performed and no documented attempts to contact for follow-up.

The patient characteristics associated with lower adherence to follow-up HSG were younger age ($p = 0.0002$), higher parity ($p = 0.0013$), and insurance type (Table 3). Seventy-three percent of this population had public insurance, but out of those who did not follow-up for HSG, 85.7% had public insurance. Differences in race and interim use of contraception were not associated with rate of HSG adherence.

Discussion

The rate of follow-up HSG 3 months after Essure hysteroscopic sterilization in this population was comparable to previously published rates for similar populations. The patient characteristics associated with HSG non-adherence were also similar to those previously studied (8,10). Maximizing HSG follow-up rates is especially important in this population due to the higher unplanned pregnancy rate (12). The baseline adherence rate in this urban population is low, though similar to that reported in other urban populations (6,10). The use of electronic reminders increased patient adherence and is a good option owing to its ease of use and application of existing resources. There has only been one previous study looking at the use of electronic reminders in 211 patients, though this study did not demonstrate a statistically significant improvement in adherence (3). This previous study did note an improvement in adherence after establishing electronic reminders in the resident-run clinic (n=122)(3), leading to the current study as the first to validate the efficacy of electronic reminders in a larger sample of patients.

Whether it is pre-procedure counseling, pre-procedure HSG consent forms (7), systematic use of electronic reminders (3), or dedicated staff to contact patients (4), all have been shown to increase HSG follow-up rates. In this practice, there was no existing protocol for ensuring HSG follow-up, and most providers started using electronic reminders because this was already a frequently used method for creating self-reminders for other tasks. It seems logical that because electronic reminders are easy to implement through Epic and require minimal time with no additional financial burden, the use of these reminders for HSG follow-up could be adopted as standard protocol.

Contraceptive failure and unplanned pregnancy after Essure hysteroscopic sterilization are frequently attributed to lack of follow-up HSG, occurring at a rate of 0.8% (2). In this study, there was one intrauterine pregnancy diagnosed three weeks after the sterilization procedure, prior to HSG. This pregnancy carried to term, resulted in a live born infant, and HSG after delivery showed bilateral tubal occlusion. Given the timing of this pregnancy, it is likely that the patient was either noncompliant with interim contraception (birth control pills) after the Essure procedure or had an extremely early pregnancy at time of the Essure procedure given the negative pre-procedure urine pregnancy test. Therefore, another area of improvement would be to ensure that reliable and realistic interim contraception is used and the proper pre-procedure counseling given.

Finally, the impact is unclear regarding transvaginal ultrasound for confirmatory testing in this population (11). An ultrasound, in this practice, is scheduled and completed by either radiology or gynecology. However, given that it is not necessary for the provider to conduct a procedure as is the case in the HSG, scheduling is much simpler and weekend/evening appointments are available. Furthermore, transvaginal ultrasound, unlike HSG, is well-known to gynecologic patients and is relatively painless. It is unclear whether this additional flexibility and familiarity would increase compliance with confirmatory testing.

Conclusion

In summary, Essure hysteroscopic sterilization can be an effective and affordable form of contraception if performed successfully and followed by 3-month follow up HSG confirmation. In a population where patient adherence is low at baseline, the use of electronic reminders through the electronic medical record increases HSG follow-up rates. If used systematically by all providers, a standard protocol could significantly increase patient adherence to HSG follow-up after Essure hysteroscopic sterilization and minimize contraceptive failure.

Acknowledgments

Funding- Dr. Arora is funded by the Clinical and Translational Science Collaborative of Cleveland, KL2TR000440 from the National Center for Advancing Translational Sciences (NCATS) component of the National Institutes of Health and NIH roadmap for Medical Research. This manuscript is solely the responsibility of the authors and do not necessarily represent the official views of the NIH.

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Table 1Patient demographics and characteristics ($N = 259$)

	Mean (SD)	Range
Age (years)	32.2 (5.9)	22–48
Gravidity	4.2 (2.1)	0–14
Parity	3.1 (1.5)	0–11
Race	<i>n</i>	%
Black/AA	132	51.0
Caucasian	88	34.0
Hispanic	29	11.2
Other	4	1.5
Unknown	6	2.3
Insurance type	<i>n</i>	%
Public	189	73.0
Private	64	24.7
Unknown	6	2.3
Contraception	<i>n</i>	%
Depo Provera	134	51.7
Pills	79	30.5
Condoms	12	4.6
Nuvaring	6	2.3
Patch	1	0.4
IUD	3	1.2
Vasectomy	1	0.4
Abstinence	3	1.2
Unknown	20	7.7

Table 2

HSG follow-up and reminder rates by provider

Provider	Procedures performed	Procedures successful	HSG at 3 mos	Patients reminded	HSG done	Adherence rate (%)
A	5	5	3	2	5	100.0
B	11	10	8	2	9	90.0
C	26	24	8	14	15	62.5
D	72	71	41	30	47	66.7
E	3	3	2	0	2	66.7
F	2	2	0	2	1	50
G	19	19	11	6	14	73.7
H	47	47	28	18	40	85.1
I	11	9	2	4	5	55.6
J	11	9	4	5	6	66.7
K	52	51	28	23	36	70.6
	259	250	135	106	180	72.0

Table 3Patient demographics and characteristics by HSG adherence ($N = 250$)

	HSG ($n = 180$)	No HSG ($n = 70$)	p
Mean age (years)	32.9	30.0	0.0002
Mean gravidity	4.1	4.5	0.1472
Mean parity	2.9	3.5	0.0013
Race (no., %)			0.4011
Black/AA	89 (49.4)	38 (54.3)	
Caucasian	63 (35.0)	23 (32.9)	
Hispanic	19 (10.6)	9 (12.9)	
Other	4 (2.2)	0 (0)	
Unknown	5 (2.8)	0 (0)	
Insurance type (no., %)			0.0088
Public	123 (68.3)	60 (85.7)	
Private	54 (30.0)	8 (11.4)	
Unknown	3 (1.7)	2 (2.9)	
Contraception (no., %)			0.2120
Depo Provera	69 (51.1)	23 (51.1)	
Pills	44 (32.6)	13 (28.9)	
Condoms	8 (5.9)	2 (4.4)	
Nuvaring	3 (2.2)	2 (4.4)	
Patch	1 (0.7)	0 (0)	
IUD	0 (0)	2 (4.4)	
Vasectomy	1 (0.7)	0 (0)	
Abstinence	0 (0)	1 (2.2)	
Unknown	9 (6.7)	2 (4.4)	