

Müllerian duct anomalies diagnosed by saline contrast sonohysterography: prevalence in a general population

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Objective: To estimate the prevalence of uterine müllerian duct anomalies in a general population.

Design: Cross-sectional study.

Setting: University hospital in collaboration with the Danish Civil Registry.

Patient(s): A total of 1,654 women randomly recruited from a general population; 686 women were eligible and accepted inclusion (429 pre- and 257 postmenopausal). Saline contrast sonohysterography (SCSH) was finally performed in 622 women (aged 20–74 years) (the procedure was impossible owing to cervical stenosis in 58, contraindicated in 2, other patient-related factors in 4).

Intervention(s): The shape of the uterus was dynamically evaluated in the transversal and longitudinal planes during SCSH and classified in accordance with American Fertility Society as normal, arcuate, septate (partial, complete), bicorn (partial, complete), or unicorn. History of previous miscarriage and menstrual cycle was obtained by a questionnaire.

Main Outcome Measure(s): Prevalence of müllerian anomalies, miscarriage, and oligomenorrhea.

Result(s): The overall prevalence of müllerian anomalies was 9.8% (61 of 622) (95% confidence interval [CI] 7.5–12.1). The majority had arcuate uteri ($n = 42$, 6.8%), 17 partial septate (2.7%), 1 complete septate (1.6%), and 1 unicorn uterus (1.6%). Müllerian anomalies were significantly more frequently diagnosed in nulliparous (20% [26 of 128]) compared with parous women (7% [35 of 494]). Müllerian anomalies were more frequent in women with oligomenorrhea compared with women with normal menstrual periods (19% [15 of 79] vs. 10% [34 of 339]). One first-trimester miscarriage or multiple miscarriages (more than one) were not significantly more frequent in premenopausal women with müllerian anomalies compared with women with normal-shaped uteri (24% [6 of 25] vs. 22% [57 of 265]).

Conclusion(s): In a general population examined by SCSH the prevalence of Müllerian anomalies is estimated at 9.8%. Müllerian anomalies were more frequent in nulliparous women. Both impaired fertility and a pregnancy-associated modulation of the uterine corpus are among explanations. Müllerian anomalies were associated with oligomenorrhea in premenopausal women. In this general population there was no association between miscarriage and müllerian anomalies; however, the number of cases was limited. (Fertil Steril® 2014; ■: ■–■. ©2014 by American Society for Reproductive Medicine.)

Key Words: Müllerian duct anomalies, congenital uterine malformations, saline contrast sonohysterography, prevalence, oligomenorrhea, reproductive medicine, miscarriage

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The female genitals are derived from the paramesonephric duct (müllerian) by a lateral fusion of the two paired müllerian ducts, which conjoin and form the uterus

and the upper part of the cervix. Septal absorption by apoptosis results in a single cavity.

Congenital uterine anomalies arise from either agenesis, fusion defects, or

absorption defects (modulation defects). Various classification systems have been developed to describe congenital uterine anomalies (1–4). The American Fertility Society classification is in widespread use, but a new exhaustive classification system has been suggested (5). Congenital uterine anomalies have been related clinically to several reproductive consequences (6, 7): oligomenorrhea (8), early miscarriage (9, 10), preterm birth (11), and fetal malpresentation, depending on the type and severity of the malformation.

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Estimates of prevalence in a general population have been derived from studies of women scheduled for laparoscopic tubal ligation (prevalence 15%) (12) or transcervical tubal sterilization (prevalence 1.9%) (13). In 1997, using three-dimensional (3D) ultrasound technology, Jurkovic et al. (14) examined a population of women undergoing ovarian cancer screening or with suspected pelvic abnormalities (prevalence 5.4%) (14). Ilan Tur-Kaspa (15) evaluated women with abnormal uterine bleeding (prevalence 9.5%) or infertility (prevalence 20%) with saline contrast sonohysterography (SCSH). The prevalence will vary depending on the definition of müllerian anomalies (MA), the diagnostic method used, and the population studied. The diagnostic methods have been classified in three groups according to diagnostic accuracy. The best diagnostic methods with accuracy >90% are combined hysteroscopy and laparoscopy, sonohysterography, and 3D ultrasound. The best methods are capable of accurately identifying uterine anomalies and classifying them to appropriate subtypes (16).

The prevalence of MA in unselected populations was estimated at 5.5% in a recent systematic review that included studies using optimal tests (7). The prevalence among very young women has not been elucidated in the previous studies, and women seeking sterilization are assumed to have an obstetric history before the decision for sterilization.

The information available on MA in a general population is sparse. The primary aim of our study was to document the prevalence of MA in a general population using SCSH and the

American Fertility Society classification criteria. The secondary aim was to relate the observed MA to history of miscarriage, to elucidate whether a possible impact on early pregnancy is detected and explore the previously described (8) relation between MA and oligomenorrhea.

MATERIALS AND METHODS

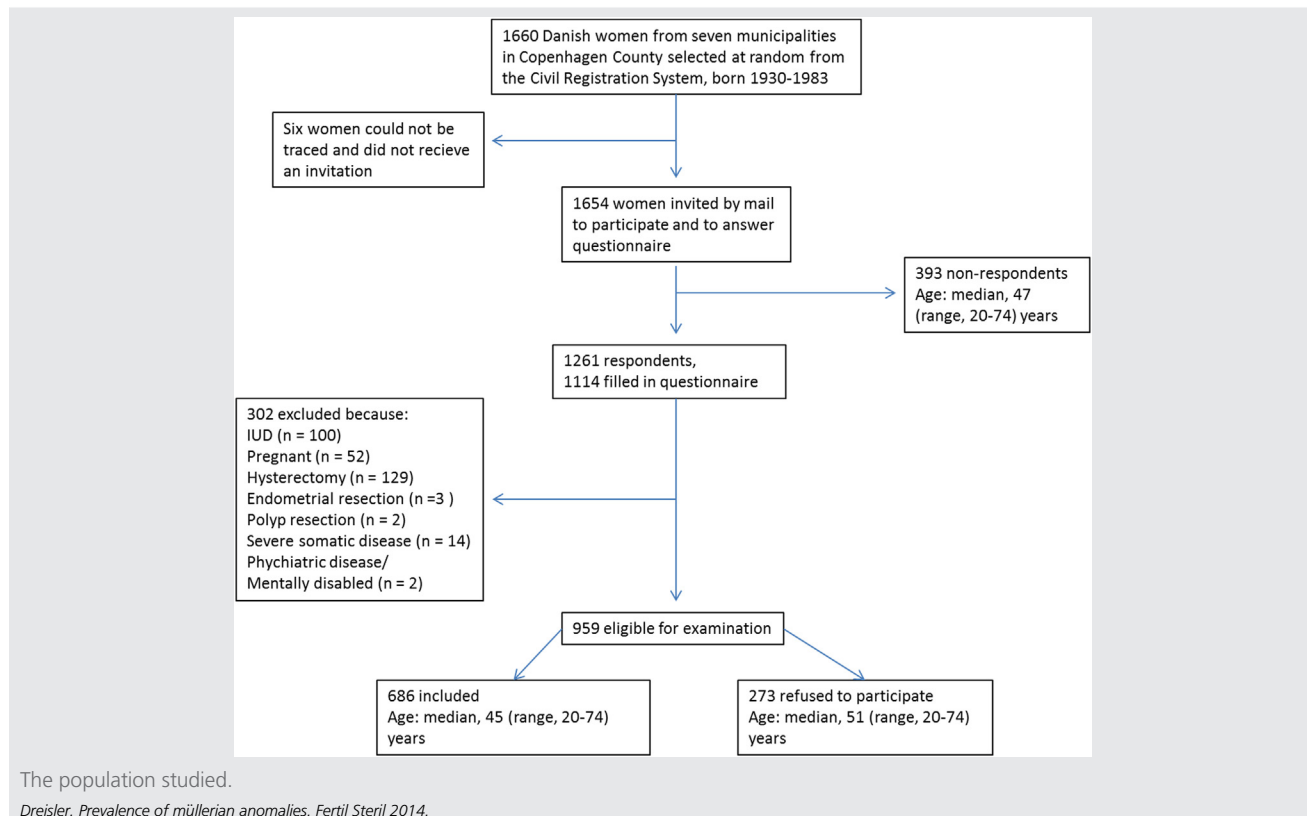
Subjects

Sixteen hundred sixty women were invited after random selection from the Danish Civil Registration System, which identifies every Danish citizen by a 10-digit number. Women born outside Denmark were not included. The women were living in seven municipalities comprising a mixture of socioeconomic areas: low-, middle-, and high-income areas were represented. The selected women were recruited by letter, including a questionnaire; 1,261 responded (76%). Three hundred two women were excluded (Fig. 1), and another 273 refused to participate. Finally, 686 women accepted examination with both transvaginal scan and SCSH. The age range was 20–74 years (median 45 years). The included women were slightly younger than those who refused to participate (median 51 years, range 20–74; $P < .05$).

Of the included women, 429 were premenopausal and 257 were postmenopausal (defined as no natural bleeding for 12 months).

Saline contrast sonohysterography was successfully performed in 622 women, aged 20–74 years, median 44 years

FIGURE 1



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