**Abstract**

**Study question:** Do the outcomes and use of ART differ between women with and without endometriosis?

**Summary answer:** ART use and outcome do not appear to differ for women with and without endometriosis, as long as endometriosis is diagnosed prior to commencing ART.

**What is known already:** Approximately 40% of women with endometriosis have infertility and ART is the recommended treatment option for these women. However, diagnosis of endometriosis can be complex and lengthy, and a delay in diagnosis can reduce the likelihood of achieving a live birth.

**Study design, size, duration:** This retrospective national cohort study used longitudinal self-report data (collected 1996-2018) from women born in 1973-1978 who are participants in the Australian Longitudinal Study on Women's Health (ALSWH). The study also used linked administrative data on Endometriosis (1970-2018), ART (1996-2020) and births (1996-2018).

**Participants/materials, setting, methods:** The outcome measures were: age at first ART cycle; use of ART treatments (IVF only; IUI only/and IVF); number of ART cycles (1-3; 4-10; 11-36); and births after first ART (no; yes) (note that births could not be tied to ART).

**Main results and the role of chance:** One in three (34.7%, n = 459/1322) women using ART had endometriosis, with 65.6% of these diagnosed before first ART and 34.4% after. Adjusted regression analyses showed women with endometriosis diagnosed before first ART were not significantly different to women without endometriosis on any outcome. However, women with endometriosis diagnosed after first ART were more likely to use IUI (adjusted odds ratio (aOR) 2.14, 95% CI 1.48, 3.09) and do more cycles (11-36 cycles: aOR 4.09, 95% CI 2.41, 6.95), and less likely to report a birth (aOR 0.67, 95% CI 0.45, 0.99), compared to women without endometriosis, despite no significant difference in starting age (coefficient = -0.62, 95% CI -1.36, 0.13).

**Limitations, reasons for caution:** We did not have information on the severity of endometriosis, or the reasons for using ART, which can influence treatment and outcomes. We were not able to reliably link births with ART treatment. Finally, it is possible that some of the women in our 'no endometriosis' group did have endometriosis and were unaware of it, although prevalence rates match population estimates.

**Wider implications of the findings:** These findings support previous studies that have found no difference in outcome of ART for women with endometriosis, but add the new insight that this is only true if endometriosis is diagnosed prior to commencing ART. A delayed diagnosis can create disadvantage during ART treatment. Early recourse to IVF may be advantageous for pregnancy prospects for women with endometriosis.