Intrauterine Device Use, Sexually Transmitted Infections, and Fertility:

A Prospective Cohort Study

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AJOG at a Glance

A. Why was this study conducted?

This study was conducted to determine if there is an association between intrauterine device (IUD) use and time to conception, after controlling for past sexually transmitted infections (STIs).

B. What are the key findings?

In this prospective observational study of 461 participants attempting conception, we found no association between IUD use (ever) and time to conception. Past infection with *Mycoplasma genitalium* was associated with time to conception and higher rates of infertility.

C. What does this study add to what is already known?

There are few prospective cohort studies evaluating contemporary IUD use and time to conception. This study adds to the literature demonstrating the safety of contemporary IUDs. The findings also suggest that *Mycoplasma genitalium* may be an important STI that may impact time to conception and fertility.

ABSTRACT

Background: In the 1970s, numerous medical reports, media coverage, and litigation around the Dalkon Shield intrauterine device (IUD) led to a perception that all intrauterine devices cause upper genital tract infection and infertility.

Objective: To assess the association between intrauterine device use and time to conception.

Study Design: The Fertility After Contraceptive Termination Study is a multicenter, prospective cohort study of women stopping their contraceptive method to attempt conception. We recruited participants between 2011 and 2017. Participants were a convenience sample of women recruited from academic centers in Philadelphia, PA, Los Angeles, CA, St. Louis, MO, Indianapolis, IN, Aurora, Colorado, and Salt Lake City, Utah. Women were eligible if they stopped their contraceptive method within the past 120 days prior to enrollment, were between 18 and 35 years of age, had no history of infertility or sterilization, and had at least 6 months of follow-up. Baseline data included demographic and reproductive characteristics, past contraceptive use, nucleic acid amplification testing for sexually transmitted infections, and serology for past infection with *Chlamydia trachomatis, Trichomonas vaginalis,* and *Mycoplasma genitalium*. The primary exposure was intrauterine device use (ever); the primary outcome was time-to-conception. All participants were followed longitudinally for 24 months. We used piecewise exponential proportional hazards models with multiple imputation to provide hazard ratios (HR) and their respective 95% confidence intervals (CI).

Results: Of the 461 participants, mean age was 28.2 years, 38.7% were Black, 34.1% were considered low socioeconomic status, and 59.7% had a history of intrauterine device use. Without adjusting for any covariates, the median time to conception was shorter for participants who had a history of intrauterine device use (5.1 months) compared to participants

who never used an IUD (7.5 months). After controlling for potential confounders, the association of past IUD use with time to conception was not statistically significant (HR_{adj}=1.25, 95% CI 0.99, 1.58). In our multivariable model, age, nulligravidity, Black race, low socioeconomic status, and past *Mycoplasma genitalium* infection (HR = 0.76, 95% CI = [0.58, 0.99]) were associated with longer times to conception. The rate of infertility was higher in participants with past *Mycoplasma genitalium* infection (68% versus 80% without past infection; p = 0.019).

Conclusions: We found no impairment of fertility with ever use of an IUD. Serologic evidence of past *M. genitalium* infection was associated with longer times to conception and higher rates of infertility. *M. genitalium* infection is a potential modifiable cause of infertility.

Abstract word count: 400 words

Keywords/Phrases: Intrauterine device (IUD), contraception, fertility, infertility, sexually transmitted infections, *Mycoplasma genitalium,*

INTRODUCTION

Since the Dalkon Shield intrauterine device (IUD) was used for contraception in the 1970s, there has been a concern that IUD use may be associated with time to conception and infertility. Hubacher's landmark study published in the New England Journal of Medicine in 2001 provided evidence to dispel this concern. This case-control study of 1895 women noted that copper IUD use was not associated with an increased risk of tubal factor infertility, once the investigators controlled for sexually transmitted infection (STI) with *Chlamydia trachomatis,* which was associated with infertility.[1]

Patient perception regarding the risks of IUD use including concerns about infection and impaired fertility still persist among patients and providers and may impair the acceptance of IUDs as a method of contraception.[2-4] In a survey of over 1600 women in the St. Louis region, Hladky and colleagues noted that common concerns about IUDs included ectopic pregnancy, sexually transmitted infections, and infertility.[2] A clinician survey in the same geographic region revealed that 29% of providers believed that the IUD increases the risk of pelvic inflammatory disease (PID).[3] The Guttmacher Institute surveyed a nationally representative sample of unmarried young adults, ages 18-29 years, and noted that 42% of 18-19 year-old and 31% of 21-24 year-old adult women believed that the IUD was "highly likely" to cause PID.[4] Two 2014 qualitative studies also echoed women's concerns regarding infection and infertility.[5,6]

We searched the medical literature for a longitudinal study that evaluates contemporary IUD use and fertility in patients in the U.S. comparing current FDA-approved devices and other contraceptive methods. We found one retrospective cohort study by Stoddard and colleagues. This report of 69 IUD users and 42 users of other contraceptive methods found no association between IUD use and subsequent fertility.[7] The goal of our prospective cohort study was to

evaluate the association of IUD use and time to conception in a cohort of women who discontinued their contraceptive method in order to attempt conception. We hypothesized that IUD use would be associated with longer time to conception after stopping a contraceptive method. We were also interested in the association of past sexually transmitted infection, specifically *Mycoplasma genitalium* and *Chlamydia trachomatis*, with time to conception.

MATERIALS & METHODS

The Fertility After Contraceptive Termination (FACT) Study is a multicenter prospective observational cohort study of 498 participants designed to assess time to conception after discontinuing an FDA-approved contraceptive method. We included patients discontinuing the IUD (either copper T380A or levonorgestrel 52mg), subdermal etonogestrel implant, oral contraceptive pills (OCPs), contraceptive patch or vaginal ring, depot medroxyprogesterone acetate (DMPA), or barrier method of contraception. FACT study participants met the following inclusion criteria: 1) age 18-35 years; 2) desiring conception; 3) sexually active with a male partner; 4) ability to consent in English or Spanish and 4) willing to comply with all study procedures and follow-up. We excluded patients with a positive pregnancy test at baseline; if they had a history of infertility or were surgically sterile; and if they used DMPA in the past 5 months, as DMPA can be associated with a longer return to fertility.[8] Prior to enrollment, we obtained institutional review board approval, and all participants completed the informed consent process.

Experienced family planning investigators recruited potential participants from the following cities: Los Angeles, California; Denver, Colorado; Indianapolis, Indiana; St. Louis, Missouri; Philadelphia, Pennsylvania; and Salt Lake City, Utah. Patients were enrolled if they had stopped their contraception in the past 120 days and desired conception. Following

enrollment, a research assistant administered a survey to assess baseline demographic and reproductive characteristics, medical/surgical history, date of contraceptive method discontinuation, date participants started trying to conceive, partner's reproductive history, and sexual history. Also, participants were specifically asked if they had used an IUD in the past. We defined low socioeconomic status (SES) as self-reported inability to pay for basic needs such as food, transportation, or housing and/or being enrolled in economic assistance program such as food stamps, welfare, or unemployment.

Upon enrollment, vaginal swabs were collected for sexually transmitted infection (STI) nucleic acid amplification testing for the following current STIs: *C. trachomatis, Neisseria gonorrhea, Mycoplasma genitalium*, or *Trichomonas vaginalis*. Serum was collected to assess serology for evidence of past *C. trachomatis* (CT)*, M. genitalium* (MG)*,* or *T. vaginalis* (TV) infection.

Follow-up surveys were conducted via phone at 6, 12, 18, and 24 months after the baseline survey to assess for pregnancy. Follow-up surveys asked participants about any pregnancies and their pregnancy outcomes that have occurred in the past 6 months. We also asked for the frequency and timing of intercourse, menstrual cycle regularity, and any changes to health or medications that may affect fertility. Medical record request authorization forms were sent to all participants so that we could perform medical chart reviews to validate pregnancy outcomes. Date of conception was determined by best available evidence using the patient's last menstrual period or gestational age as determined by ultrasonography.

Patient demographics and characteristics were summarized with means and standard deviations or frequencies and percentages and compared using appropriate statistical tests (i.e., t test, chi-square test, or Fisher's exact test). Our primary outcome, time to conception, was

defined from the date of stopping contraceptive method to the date of conception, censoring those who had not yet conceived on the date of last survey assessment. For women who had survey assessments regarding pregnancy, but no date of conception or last menstrual period recorded, left and interval censoring were used based on interview dates. For example, if a women said 'No' at the 6-month assessment to getting pregnant but reported 'Yes' at the 12-month assessment, then conception occurred sometime between the 6-month assessment date and the 12-month assessment date. Women who reported a pregnancy at their first follow-up assessment were left censored at the time of assessment. Women who only reported 'No' to becoming pregnant, were right censored at their last assessment date. We also estimated the percentage of women who did not conceive within 12 months (infertility).

The median time to conception (months) and 95% confidence intervals for each type of infection was estimated using nonparametric estimates of the survival function . Additionally, the p-value corresponding to the generalized log-rank test for equality of the survival curves is reported. Nonparametric curves for the probability of conception were plotted with strata defined by either prior IUD use or MG infection status.

To gain precision in parameter estimates, we used multiple imputation using the fully-conditional specification to impute missing covariate information for age, marital status, low SES, nulligravida, IUD use, and race. This method assumes data are missing-at-random and is appropriate as there was very little missing covariate information (< 5%). Infection status was not imputed since a larger proportion of data was missing.

Proportional hazards models with piecewise constant baseline hazard were used to determine if IUD use or infection status (MG, CT, or TV) was associated with time to conception after adjusting for covariates of patient age at enrollment (years), race (Black, white, other),

marital status (married/cohabitating vs other), nulligravid, and low SES. A separate model was fit for each type of infection since these infections are correlated. For each infection type, a categorical variable was included (positive, negative, and unknown/missing). Model results were combined across the 20 imputed datasets using Rubin's rules.[9] Appropriate model diagnostic plots were examined to assess model assumptions and adequacy.

Our *a priori* sample size calculation was based on the ability to detect a relative risk of infertility in the IUD group of 1.75 assuming a baseline rate of infertility of 15%, with type 1 error set at .05. If we observed equal prior IUD users and non-users in our convenience sample, then 404 participants would be required to achieve 80% power to detect this relative risk.

RESULTS

We enrolled 498 women and 461 participants met inclusion criteria and had available follow-up data for at least 6 months. The demographics and characteristics of the patient population, stratified by ever use of an IUD, are provided in Table 1. The mean age of the cohort was 28.2 years. Thirty-nine percent were Black; 34.1% were of low socioeconomic status, and 38.3% were nulliparous. In terms of current infection (positive polymerase chain reaction testing at baseline): 0.2% were positive for *Neisseria gonorrhoeae* (GC); 4.3% were positive for *C. trachomatis* (CT)*;* 7.6% were positive for *T. vaginalis* (TV)*;* and 9.1% had evidence of *M. genitalium* (MG) infection. Serologic testing revealed that 42.8% had a past infection with either *C. trachomatis, T. vaginalis, or M. genitalium*. The most common past infection was *M. genitalium* (33%). Of the 461 participants, 275 (59.7%) had a prior history of IUD use; most of these women (>85%) recently stopped their IUD to attempt conception. When we compared the

characteristics of past IUD users to non-users, we found that IUD users were older and were less likely to be nulligravid (Table 1).

Of the 461 women, 116 (25.2%) were right censored at their last assessment date as conception did not occur. We obtained accurate time of conception date for 327 (94.8%) of the 345 woman that conceived. . Nine participants (2.0%) were left censored as they were pregnant at the time of first survey assessment without a date of conception. In addition, 9 (2.0%) participants were interval censored as they became pregnant between survey assessments without a date of conception available.

Prior to adjusting for any covariates, the median time from stopping contraceptive method to conception was 6.1 months (95% confidence interval (CI) 4.9, 7.3). More than three quarters (76.5%) of participants conceived by 12 months. Time to conception was shorter for women with a history of IUD use than women without (5.1 months versus 7.5 months, respectively, p-value = 0.029; see Table 2). The nonparametric curves with strata defined by prior IUD use is provided in Figure 1 with the y-axis representing the probability of conception and the x-axis representing time in months from stopping contraceptive method.

Without adjusting for any covariates, median time to conception was estimated to be longer for women with serologic evidence of past infection versus those without but was only statistically significant for *M. genitalium* or any past infection: *T. vaginalis* 8.2 months versus 5.9 months (p-value = 0.243); *C. trachomatis* 7.6 months versus 5.6 months (p-value = 0.226); and *M. genitalium* 8.9 months versus 5.0 months (p-value =0.006). The estimated failure curves with strata defined by past infection of *M. genitalium* are provided in Figure 2.

From the piecewise exponential model including the *M. genitalium* infection status (Table 3), older age (adjusted hazard ratio (HR) = 0.95, 95% CI = [0.92, 0.98]), low SES (HR =

0.71, 95% CI = [0.54, 0.94]), nulligravida (HR = 0.76, 95% CI = [0.58, 0.98]), black race (HR = 0.71, 95% CI = [0.53, 0.95]), and positive serology for *M. genitalium* infection (HR = 0.76, 95% CI = [0.58, 0.99]) were all significantly associated with a *longer* time to conceive (p-value < 0.05). In the subset of women with MG past infection status and in which we could determine whether they were pregnant by 12 months, 76.4% (259/339) conceived by 12 months. Among participants with positive MG serology, 68.3% (71/104) conceived by 12 months compared to 80.0% (188/235) MG-negative women (p=0.019).

Being married (or having a cohabitating partner) was associated with a shorter time to conceive (HR = 1.59, 95% CI = [1.13, 2.24]. Previous use of an IUD (HR = 1.25, 95% CI = [0.99, 1.58]) almost met the cut-off of significance and was in the opposite direction than expected in that women that used an IUD had a shorter time to conceive (p = 0.056). Body mass index (BMI) was added as potential covariate after initially running the models. BMI was found to be associated with race in that BMI was significantly higher for Black women (mean = 32.0), compared to white women (mean = 26.0). Prior to including infection status, we examined the fit of the models with and without including BMI and found that BMI was not statistically significant with age (as continuous) and race in the model.; thus, we did not include BMI in the reported model. The proportional hazards assumption was only questionable for the covariate of low SES; thus, we additionally ran the model by stratifying by low SES, but model results were similar to reported model. Thus, we deemed the proportional hazards assumption for the overall model to be appropriate.

The association of covariates with time to conception were similar for the model using *C. trachomatis* serologic status for past infection status with the exception that nulligravid did not meet the cut-off for statistical significance (HR = 0.77, 95% CI = [0.59, 1.01], p-value = 0.056), see Appendix Table 1. Positive serology for *C. trachomatis* infection was not significantly

associated with time to conception after adjusting for covariates (p-value = 0.536). The association of covariates with time to conception for the model with past *T. vaginalis* infection was also similar to the model with *M. genitalium* infection (see Appendix Table 1). However, positive serology for *T. vaginalis* infection was not significantly associated with time to conception (p-value = 0.271; see Appendix Table 2).

COMMENT:

We found no association of a history of IUD use (ever) with time-to-conception. In fact, the effect estimate was in the positive direction: time to conception was shorter for participants with a history of IUD use compared to participants without such history. This association, however, was not statistically significant. Median time to conception and rates of infertility (failure to conceive within one year) were higher than that reported in the literature, but this difference may be due to the characteristics of the patients enrolled in our study (e.g. greater percentage of women of low SES, greater percentage of women of color, and high rates of past STI). Other typical factors associated with lower conception rates (e.g. age, nulliparity, marital/cohabitation status, and Black race) were associated with longer times to conception, as expected.[10-12] Serologic evidence of past *M. genitalium* infection, was also associated with infertility; this is an intriguing finding. Past infection with *C. trachomatis* or *T. vaginalis* were not associated with time to conception.

Infertility affects approximately 12% of reproductive-aged women each year. Although many factors exist contributing to the diagnosis of infertility, one recognized preventable risk factor for infertility is genital tract infections.[1] Untreated lower genital tract infections may eventually lead to ascending infections such as pelvic inflammatory disease (PID). PID involves

inflammation and infection of the upper genital tracts and may cause structural or functional fallopian tube damage known as tubal factor infertility.[13-15]

Ascending *C. trachomatis* infection can lead to PID and cause inflammation and tubal scarring.[16] Hubacher found a statistically significant association between tubal occlusion and the presence of *C. trachomatis* antibodies among women who had not used a copper IUD (odds ratio, 2.4; 95% CI 1.7, 3.2). There was no significant association between antibodies to *C. trachomatis* and tubal infertility among women who had used an IUD, but the number of women in this subgroup was small. [1]

The literature evaluating the association of *M. genitalium* and infertility is sparse. A Swedish serologic study found that a positive serum IgG for *M. genitalium* was more common among women of infertile couples (5.4%) than among fertile controls (1.6%; OR 3.5, 95% CI 1.1, 10.8); but after adjusting for positive serology for *C. trachomatis,* this finding was no longer statistically significant (adjusted OR=3.0 (0.95 to 9.5)).[17] In a large study of women with clinically diagnosed PID, Haggerty found that *M. genitalium* positivity was strongly associated with endometritis (upper tract infection), but they found no association of *M. genitalium* and infertility. [18] This study had limited power to assess this association.

Our findings add to the body of medical literature that has shown little impact of IUD use on conception rates. The strength of our study is the multicenter recruitment of a diverse sample, prospective recruitment and follow-up, and a high number of IUD users. We tested for current STIs, and also obtained serologic data regarding past STIs to be sure we could control for past STIs in our multivariable model. FACT participants complied with our research study procedures and had excellent follow-up rates.

Our study does have some limitations. First, while our sample size was large, this was a convenience sample. Even with a large sample size, the number of positive current infections was too small for meaningful analysis. Our original sample size calculation was based on a relative risk for infertility assuming an equal number of women would have prior IUD use vs no prior use. However, we used time to conception as our primary outcome measure which provided more statistical power. If the median survival in those without IUD use is approximately 6 months, then our current sample size would provide 80% power to detect a HR of 0.75 for those with previous IUD use relative to non-users based on a two-sided log-rank test. Also, it is possible that some participants may have not accurately recalled the precise date they stopped their method and started to attempt conception. This may also have varied between methods. Accuracy of the estimates of time to conception was only minimally reduced by the need to use interval censoring since careful conception dating was conducted for the majority (95%) of women. We also could not assess duration of IUD use in our cohort. Contrary to our findings, Doll and colleagues found that duration of IUD user in women who have never given birth was associated with higher rates of infertility.[19] However, in the Doll study almost all IUDs were copper, women using IUDs were more likely to be older and to not desire future fertility. Despite the multicenter recruitment, our study sample may not be generalizable to all women in the U.S. We studied time to conception but, unfortunately, we do not have data regarding the cause of infertility (e.g. tubal factor).

In conclusion, we found no evidence to support the association of IUD and infertility. Further studies should assess the role of specific STI pathogen (i.e., *M. genitalium*) and race on time to conception, and whether screening and treatment for *M. genitalium* can reduce the risk of infertility.

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TABLE 1: Patient demographics and characteristics at baseline stratified by previous IUD Use

	Previous IUD Use			
	No (N=186)	Yes (N=275)	Total (N=461)	p-value
Age				0.002[1]
N	185	271	456	
Mean (SD)	27.5 (4.19)	28.6 (3.79)	28.2 (4.00)	
Body mass index (BMI)				0.901[1]
N	184	272	456	
Mean (SD)	28.4 (8.42)	28.3 (7.42)	28.4 (7.83)	
Race, n (%)				0.852[2]
Black	74 (40.0%)	103 (37.9%)	177 (38.7%)	
White	95 (51.4%)	147 (54.0%)	242 (53.0%)	
Other	16 (8.6%)	22 (8.1%)	38 (8.3%)	
Hispanic, n (%)				0.684[2]
No	172 (92.5%)	257 (93.5%)	429 (93.1%)	
Yes	14 (7.5%)	18 (6.5%)	32 (6.9%)	
Married/Partner, n (%)				0.152[2]
No	39 (21.0%)	43 (15.8%)	82 (17.9%)	
Yes	147 (79.0%)	230 (84.2%)	377 (82.1%)	
Nulligravid, n (%)				<.0001[2]
No	85 (46.4%)	192 (72.2%)	277 (61.7%)	
Yes	98 (53.6%)	74 (27.8%)	172 (38.3%)	
Low SES, n (%)				0.740[2]
No	121 (65.1%)	183 (66.5%)	304 (65.9%)	
Yes	65 (34.9%)	92 (33.5%)	157 (34.1%)	
CT infection (serology), n (%)				0.305[2]
No	125 (76.7%)	199 (80.9%)	324 (79.2%)	
Yes	38 (23.3%)	47 (19.1%)	85 (20.8%)	
MG infection (serology), n (%)				0.685[2]
No	101 (68.2%)	155 (66.2%)	256 (67.0%)	
Yes	47 (31.8%)	79 (33.8%)	126 (33.0%)	
TV infection (serology), n (%)				0.787[2]
No	146 (84.4%)	227 (85.3%)	373 (85.0%)	
Yes	27 (15.6%)	39 (14.7%)	66 (15.0%)	

TABLE 1: Patient demographics and characteristics at baseline stratified by previous IUD Use

	Previous IUD Use			
	No (N=186)	Yes (N=275)	Total (N=461)	p-value
				0.636[2]
Past Infection (serology), n (%)				
No	102 (58.6%)	151 (56.3%)	253 (57.2%)	
Yes	72 (41.4%)	117 (43.7%)	189 (42.8%)	
Current Chlamydia (CT), n (%)				0.242[2]
Negative	167 (94.4%)	259 (96.6%)	426 (95.7%)	
Positive	10 (5.6%)	9 (3.4%)	19 (4.3%)	
Current M. genitalium (MG), n (%)				0.617[2]
Negative	144 (90.0%)	225 (91.5%)	369 (90.9%)	
Positive	16 (10.0%)	21 (8.5%)	37 (9.1%)	
Current Trichomonas vaginalis (TV), n (%)				0.621[3]
Negative	164 (92.1%)	246 (92.1%)	410 (92.1%)	
Positive	13 (7.3%)	21 (7.9%)	34 (7.6%)	
Unsatisfactory	1 (0.6%)	0 (0.0%)	1 (0.2%)	
Current N. gonorrhoeae (GC), n (%)				--
Negative	175 (98.9%)	268 (100.0%)	443 (99.6%)	
Positive	1 (0.6%)	0 (0.0%)	1 (0.2%)	
Unsatisfactory	1 (0.6%)	0 (0.0%)	1 (0.2%)	

[1]Equal variance two sample t-test; [2]Chi-Square p-value;[3]Fisher's Exact test

SES = socioeconomic status

MG = *Mycoplasma genitalium*

CT = *Chlamydia trachomatis*

TV = *Trichomonas vaginalis*

Table 2: Median time to conception by past infection status or IUD use

	N	N Conceived	Median (months)‡	95% CI	Generalized log-rank test p-value
IUD Use	461	345			
No	186	132	7.50	[5.76, 9.28]	0.029
Yes	275	214	5.13	[4.24, 6.35]	
MG Infection	382	288			
No	256	202	4.84	[3.95, 6.55]	0.006
Yes	126	86	8.52	[5.53, 13.29]	
CT Infection	409	305			
No	324	245	5.56	[4.51, 7.27]	0.226
Yes	85	60	7.60	[4.41, 10.63]	
TV Infection	439	329			
No	373	282	5.53	[4.61, 7.20]	0.243
Yes	66	47	8.22	[4.11, 13.29]	
Past Infection	442	331			
No	253	198	5.13	[4.24, 6.58]	0.016
Yes	189	133	7.76	[5.53, 10.20]	

†Pregnancy occurred during follow-up if women were uncensored, left censored, or interval censored.

‡Median time in months from stopping contraceptive method to conception.

IUD = intrauterine device

MG = *Mycoplasma genitalium*

CT = *Chlamydia trachomatis*

TV = *Trichomonas vaginalis*

TABLE 3: **Multivariable piecewise exponential model for time from stopping contraception| to conception (combined across 20 imputations)**			
Variable	**HR**	**95% CI**	**p-value**
Previous IUD Use	1.25	[0.99, 1.58]	0.056
Age	0.95	[0.92, 0.98]	0.001
Low SES	0.71	[0.54, 0.94]	0.016
Married/Partner	1.59	[1.13, 2.24]	0.008
Nulligravid	0.76	[0.58, 0.98]	0.038
Race (Black vs White)	0.71	[0.53, 0.95]	0.023
MG past infection (serology positive vs negative)	0.76	[0.58, 0.99]	0.047

HR = hazard ratio

CI = confidence interval

SES = socioeconomic status

MG = *Mycoplasma genitalium*

IUD = intrauterine device

Legend

Figure 1: Nonparametric estimates of probability of conception stratified by prior IUD Use.

Figure 2: Nonparametric estimates of probability of conception stratified by past *Mycoplasma genitalium* infection.

Figure 1

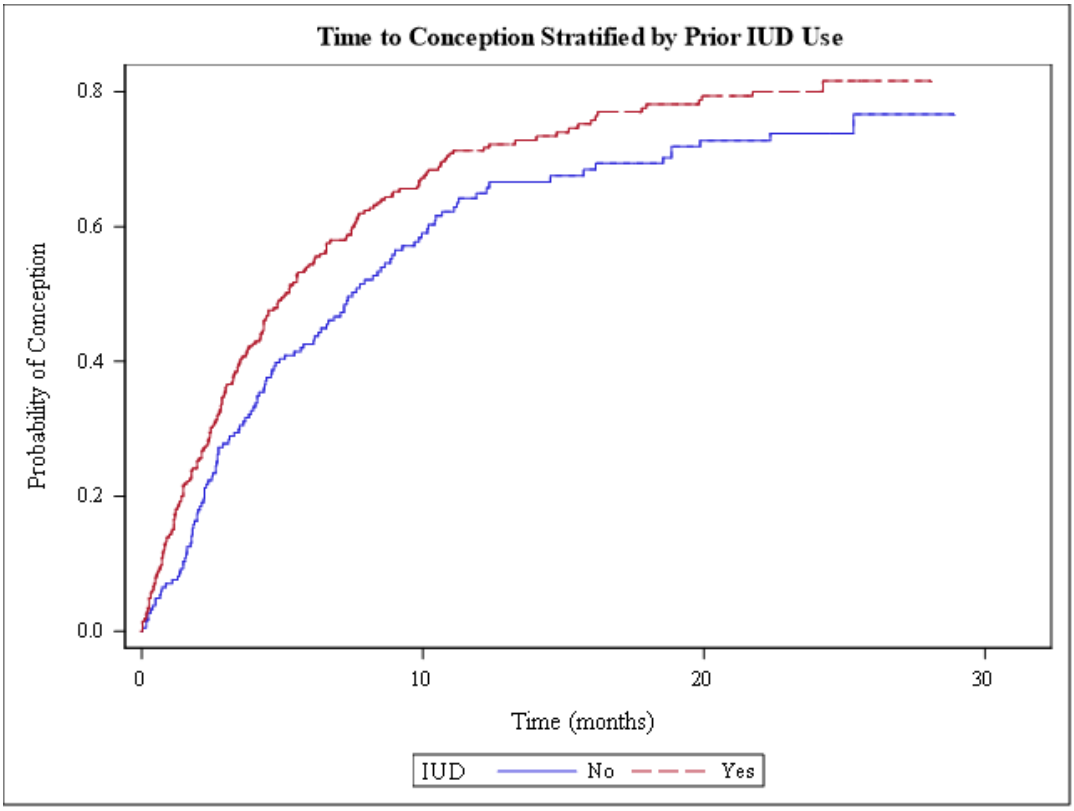
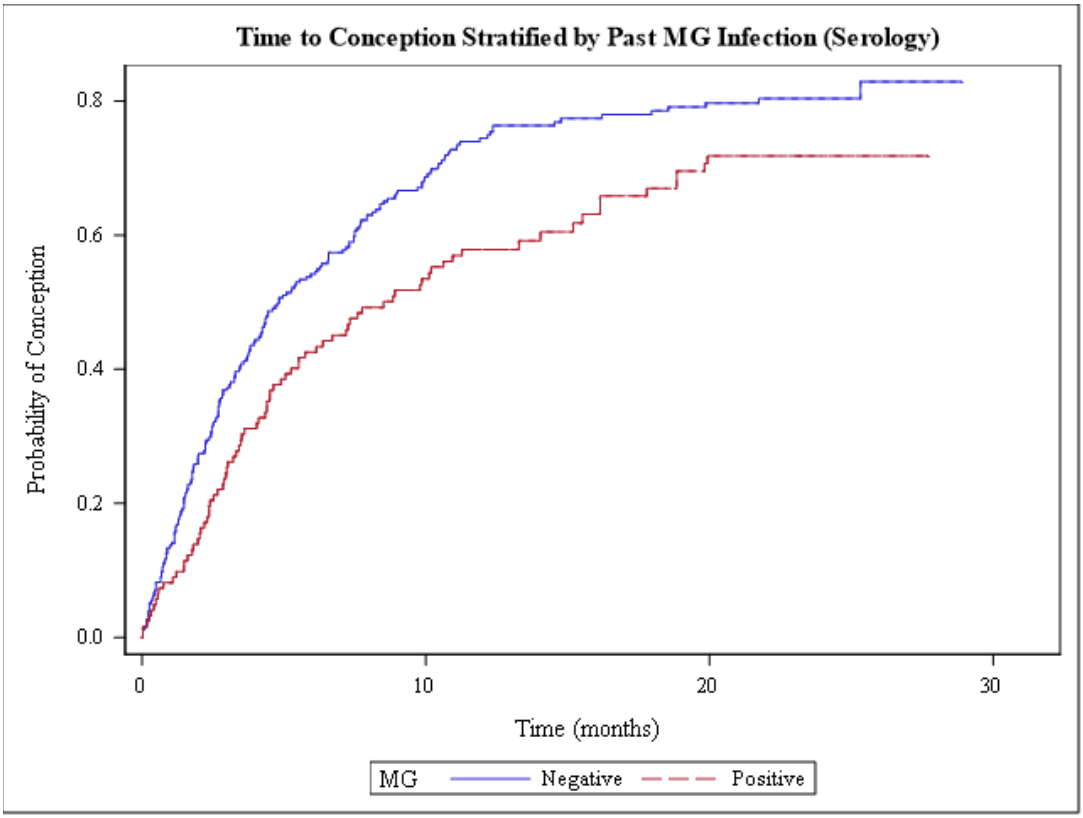

Time to Conception Stratified by Prior IUD Use
Probability of Conception
0.0
0.2
0.4
0.6
0.8
0
10
20
30
Time (months)
IUD
No
Yes

Figure 2


Time to Conception Stratified by Past MG Infection (Serology)
Probability of Conception
0.0
0.2
0.4
0.6
0.8
0
10
20
30
Time (months)
MG
Negative
Positive