妊娠確率と性交のタイミングに関する予備的解析

A preliminary analysis on fecundability and timing of sexual intercourse

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Background: Probability of conception per menstrual cycle (fecundability) is linked to incidence of infertility. Considering that compared to Western couples Japanese couples tend to show lower frequency of intercourse and that fertile period in a menstrual cycle lasts only for a week or so, timing of intercourse might matter more for Japanese couples as to a woman can achieve a pregnancy or not in a specific menstrual cycle.

Objectives: To analyze how frequency and timing of sexual intercourse affects fecundability.

Methods: A prospective cohort study was conducted in Japan targeting nulliparous women (n=80) who were trying to conceive and had no known history of infertility. The participants were followed up until confirmation of clinical pregnancy, or for up to 24 weeks, during which daily information on menstrual bleed and sexual intercourse (with or without insemination) was collected. The participants also tested ovulation and pregnancy using home test kits. For statistical analysis first day of positive ovulation test in each cycle was labelled F-1. In each cycle eight days, i.e. F-6 (5 days before F-1) to F1 (2 days after F-1), were defined to cover the fertile period. Baseline characteristics were compared between participants who did vs. did not conceive during follow-up. Using the cycle-level data logistic regression analysis was conducted with conception in each cycle as an outcome and frequency and timing of intercourse as explanatory variables.

Results: During follow-up 35 out of 80 women conceived. The mean (SD) number of days with intercourse with insemination was 3.2 (3.0) per menstrual cycle and it was 0.4 (1.4) for intercourse without insemination (n=367 menstrual cycles). Women who discontinued contraception 24+ months before the survey were less likely to conceive (Table 1). The multiple logistic regression analysis revealed that intercourse on F-1 is positively associated with fecundability, while number of days with intercourse per cycle was not (Table 2). Unexpectedly we found that probability of conception was higher if a cycle had sexual intercourse without insemination, after adjusting for frequency and timing of intercourse with insemination.

Table 1 Basic characteristics of the participants at study baseline by conception during follow-up (n=80). Mean (SD) or n (%). P-values by Wilcoxon's rank sum test for continuous variables and by Fisher's exact test for categorical variables.

		Conceived during follow-up		
Characteristics	Total (n=80)	No (n=45)	Yes (n=35)	P-value
Age (year)	29 (3)	30 (3)	29 (3)	0.099
Partner's age (year)	32 (5)	32 (5)	32 (4)	0.981
BMI (kg/m^2)				0.011
<18.5	12 (15%)	2 (4%)	10 (29%)	
18.5-22.9	56 (70%)	36 (80%)	20 (57%)	
23.0+	12 (15%)	7 (16%)	5 (14%)	
Smoker	4 (5%)	2 (4%)	2 (6%)	1.000
Duration since discontinuing contraception (month)				0.004
0-11	50 (63%)	25 (56%)	25 (71%)	
12-23	14 (18%)	5 (11%)	9 (26%)	
24+	11 (14%)	10 (22%)	1 (3%)	
Do not remember	5 (6%)	5 (11%)	0 (0%)	

Table 2. Logistic regression analysis on conception and frequency and timing of sexual intercourse (n=367 menstrual cycles; n=35 with and n=332 without conception).

	Odds ratio (95% confidence interval)	
Explanatory variable	Bivariate models	Multivariate model[c]
Intercourse[a] on F-6	1.5 (0.5, 3.5)	0.9 (0.3, 2.4)
Intercourse[a] on F-5	2.8 (1.2, 6.0)	2.3 (0.9, 5.8)
Intercourse[a] on F-4	1.9 (0.8, 4.1)	1.7 (0.6, 4.5)
Intercourse[a] on F-3	1.4 (0.5, 3.2)	1.1 (0.4, 2.6)
Intercourse[a] on F-2	1.1 (0.5, 2.5)	1.0 (0.3, 2.4)
Intercourse[a] on F-1	3.8 (1.9, 8.1)	3.5 (1.6, 7.6)
Intercourse[a] on F0	1.0 (0.5, 2.2)	0.8 (0.3, 1.8)
Intercourse[a] on F1	1.2 (0.4, 2.6)	0.8 (0.3, 2.1)
Number of days with intercourse[a] per cycle	1.1 (1.0, 1.3)	1.1 (0.9, 1.2)
Any days with intercourse[b] per cycle	2.9 (1.4, 5.9)	2.3 (1.1, 4.9)

a: with insemination, b: without insemination, c: all the explanatory variables shown in the table were included in the model