

Time to pregnancy and pregnancy outcome

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Objective: To investigate whether the outcome of a pregnancy is related to the time required to achieve that pregnancy (TTP).

Design: The distribution of the TTP for pregnancies ending in multiple birth, early (before week 12) and late (weeks 12–28) miscarriage, stillbirth, and extrauterine pregnancy was compared to that of pregnancies ending in singleton birth. Furthermore, the distribution of the TTP for preterm singleton births was compared to that of full-term singleton births.

Setting: Sweden.

Patient(s): Information from three previous studies on reproduction was used: Women chosen for exposure to persistent organochlorine pollutants, or exposure as a hairdresser, and their respective controls.

Intervention(s): None.

Main Outcome Measure(s): Self-reported pregnancy outcome.

Result(s): An increased TTP (i.e., decreased fecundability) was associated with pregnancies ending in miscarriage (early as well as late) and extrauterine pregnancies. Pregnancies ending in multiple live birth tended to have shorter TTPs than those ending in single live birth. No association between TTP and stillbirths was found. Among women whose pregnancies ended in singleton birth, a prolonged TTP was associated with preterm delivery.

Conclusion(s): The TTP of a pregnancy seemed to be associated with the outcome of that pregnancy. The mechanisms behind this phenomenon are, however, unclear. (*Fertil Steril*® 2005;84:966–74. ©2005 by American Society for Reproductive Medicine.)

Key Words: Fertility, pregnancy outcome, gestational age

The time needed to achieve a wanted pregnancy—time to pregnancy (TTP)—can be used to estimate fecundability (1) and has been found to be a useful tool for the assessment of reproductive effects (2). It is easily achievable information, which can be collected retrospectively (2) by using self-administered questionnaires (3). However, as easy as TTP is to inquire about, it is difficult to explain the complex mechanisms of biologic, sociologic, and environmental factors that may affect TTP. By investigating the possible association between TTP and pregnancy outcome, the understanding of these mechanisms may be facilitated (4).

Previous studies have found that pregnancies ending in miscarriage took longer to achieve than those ending in live birth (4, 5) and that miscarriages were more common among subfertile women (6). With respect to twin births, a recent study has found a reduced risk associated with a long TTP (7). Furthermore, pregnancies with a long TTP (4) and pregnancies among subfertile women (8, 9) were more likely to end with preterm delivery than to be full term.

The aim of the present study was to further explore a possible association between TTP and the risk of preterm delivery as well as different pregnancy outcomes such as miscarriage, stillbirth, multiple birth, and extrauterine pregnancies.

MATERIALS AND METHODS

Study Population

The present study is based on information collected in three previous studies, which were all approved by the Ethics Committee at Lund University. In total, 5,302 women were included in the present study.

Fishermen's Wives. In 1997, a self-administered questionnaire which included questions on TTP and pregnancy outcome was sent to women born in 1945 or later who were married to fishermen on the Swedish east coast. The rationale for the use of this group of women was that the fish caught off the Swedish east coast (i.e., in the Baltic Sea) are contaminated by persistent organochlorine compounds (POCs). Indeed, these fish are an important source of exposure to POCs in the Swedish population (10–12). Previous studies had found that Swedish fishermen and their families on average consume more fish than the general Swedish population (10, 13, 14). Thus, the east coast fishermen's wives were considered an appropriate study group to investigate health effects from dietary POC exposure.

Fishermen's wives on the Swedish west coast have been found to be similar to the east coast wives with respect to socioeconomic factors as well as fish consumption (10, 13–

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15). However, the fish caught on the west coast are less contaminated (15). Therefore, the west coast wives were considered as an appropriate referent cohort. Note that we have refrained from using the term “nonexposed.” Because POCs are so widely distributed in the environment there is virtually no person who is not exposed to these compounds. The number of respondents to the questionnaire was 505 east coast and 1,090 west coast women (Table 1).

The information collected through the questionnaires was used to investigate the relation between on one hand POC exposure and on the other TTP (16), miscarriages (17), and menstrual cycle length (18).

Fishermen’s Sisters. Similar to the fishermen’s wives, sisters to Swedish fishermen also have a high average fish consumption (10, 13, 14). Furthermore, they are more likely to have grown up in a fisherman’s family and/or fishing village than fishermen’s wives and women from the general Swedish population (19). Thus, east coast fishermen’s sisters are likely to have been exposed to POCs during their childhood and adolescence. Again, the corresponding group of women from the Swedish west coast was regarded as a suitable referent cohort.

In 1999, self-administered questionnaires which included questions on TTP and pregnancy outcome were sent to fishermen’s sisters born between 1945 and 1979. The number of respondents were 709 and 1,103 in the east and west coast cohorts, respectively (Table 1). As with the fishermen’s wives the objective of the study was to investigate the

relation between POC exposure and TTP, miscarriage (20), and menstrual cycle length (18).

Hairdressers/General Population. In order to assess health effects of working as a hairdresser, a cohort of women who had graduated from Swedish vocational schools for hairdressers was established (21). As referents, age-matched women from the general Swedish population were chosen. In 2000, all women born in 1960 or later in the two cohorts were sent self-administered questionnaires including questions on TTP and pregnancy outcome. The number of respondents in the hairdresser cohort was 2,626 and in the general population cohort 2,860 (Table 1).

The information collected through the questionnaires will be used to study reproductive outcomes among hairdressers (Axmon et al., unpublished data).

Time to Pregnancy

Information on TTP was collected somewhat differently in the three studies. Whereas the fishermen’s wives were simply asked, “How many months did it take you to become pregnant?,” a line of questions were used to establish TTP among the fishermen’s sisters and hairdressers/general population: “Did you become pregnant the first month of trying? If no, did you become pregnant the second month of trying? If no, in which month did you become pregnant?”

All women were asked the question, “Was the pregnancy a result of any medical treatment?” The women who an-

TABLE 1

Women included in a study on a possible association between time to pregnancy (TTP) and pregnancy outcome.

Original study	Cohort	Size of cohort	Responders to questionnaire	Response rate (%)	Information available on TTP	Information available on pregnancy outcome ^a
Fishermen’s wives	East coast (exposed)	795	506	64	401	378
	West coast (referents)	1,851	1,090	59	939	870
Fishermen’s sisters	East coast (exposed)	1,241	709	57	563	519
	West coast (referents)	2,023	1,103	55	866	817
Hairdressers	Hairdressers (exposed)	5,289	2,626	50	1,595	1,396
	General population (referents)	5,299	2,860	54	1,491	1,322
Total		16,498	8,893	54	5,855	5,302

^a Excluding induced abortions and still ongoing pregnancies.

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