

MENARCHEAL AGE AND MISCARRIAGE¹

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Recently, Liestol (1) and Casagrande et al. (2) have shown that miscarriage rates decrease with increasing menarcheal age, although in the latter study this association was restricted to the first pregnancy. These results prompted us to examine associations between menarcheal age and the occurrence of miscarriages among the women who participated in a multicenter breast cancer screening program, the Breast Cancer Detection Demonstration Project (3). Our study population consisted of a sample of white screenees interviewed at ages 31–74 years, who had been selected as controls in a case-control study of breast cancer (4). Completed interviews were available for 1250 controls; of these 158 were eliminated because they had never been pregnant, 16 because of unusual pregnancy outcomes (primarily ectopic pregnancies), and six because of missing information. We had self-reported information about the outcome of the first five pregnancies for the remaining 1070 women.

Our first analysis used selection criteria similar to those of Casagrande et al.: we ignored a woman's pregnancies following her first miscarriage; we also ignored pregnancies resulting in and following an induced abortion. These exclusions were made to remove any effect of induced or spontaneous abortion on the probability of miscarriage in a subsequent pregnancy. The miscarriage rates according to menarcheal age for the first five pregnancies are shown in table 1. We

observed a decreasing trend in the miscarriage rate with increasing age at menarche only among first pregnancies, a result similar to that observed by Casagrande et al. (2). This trend was apparent through menarcheal age 14, after which the miscarriage rate substantially increased. This rate was particularly high (19.1) for those with menarche at age 16 or later. Univariate adjustment for age at interview, age at first pregnancy, year of pregnancy, income, menstrual cycle irregularity and Quetelet's index did not substantially alter these results. No trend by menarcheal age was seen in miscarriage rates for the second through fifth pregnancies.

Since the age-adjusted miscarriage rate was higher in women with a prior miscarriage (22.7 per cent) than in those without (11.6 per cent), we divided our study subjects into two groups. Table 2 shows miscarriage rates during the first pregnancy according to eventual number of miscarriages. For women with at most one miscarriage, an early (younger than 11) or late (older than 15) menarche was associated with an elevated risk. No other trends by menarcheal age were apparent. Adjustments for age at first pregnancy left the pattern of miscarriage risk by menarcheal age essentially unchanged. In contrast, among women with two or more miscarriages, risk of miscarriage in a first pregnancy decreased with increasing menarcheal age, although this observation was based on only 90 women.

These data suggest that the declining trend in miscarriage rates with increasing age at menarche observed in other studies may reflect the distribution of

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TABLE 1
Miscarriage rate for the first five pregnancies as a function of menarcheal age (data from the Breast Cancer Detection Demonstration Project (4))

Menarcheal age (years)	Pregnancy no.					Total
	1	2	3	4	5	
	No.*	No.	No.	No.	No.	No.
<12	22/166	11/125	10/73	4/29	0/10	47/403
12	31/253	22/202	17/114	4/53	5/24	79/646
13	37/324	21/248	12/134	7/63	2/29	79/798
14	16/176	20/137	10/77	5/35	1/15	52/440
15+	25/151	11/106	6/57	6/25	1/7	49/346
Total	131/1070	85/818	55/455	26/205	9/85	306/2633

* Numbers shown are: number of miscarriages/total number of pregnancies excluding those resulting in an induced abortion and those subsequent to an induced abortion or miscarriage.

TABLE 2
Miscarriage rate in a first pregnancy as a function of menarcheal age by total number of miscarriages (data from the Breast Cancer Detection Demonstration Project (4))

Menarcheal age (years)	Women with 1 miscarriage		Women with 2 or more miscarriages	
	No.*	%	No.*	%
<11	6/32	18.8†	21/9	233.3‡
11	9/119	7.6†	6/8	75.0‡
12	17/230	7.4†	7/7	100.0‡
13	27/303	8.9†	8/5	160.0‡
14	12/163	7.4†	7/4	175.0‡
15	7/74	9.5‡	9/7	128.6‡
16+	8/59	13.6‡	12/7	171.4‡
Total	86/980	8.8	45/90	50.0

* Numbers shown are: number of miscarriages/total number of pregnancies excluding those resulting in an induced abortion.

† Adjusted for age at first pregnancy.

‡ For comparison with the menarcheal age categories of table 1, the miscarriage rate for less than 12 years was 9.9 per cent.

§ For comparison with table 1, the miscarriage rate for menarcheal age 15 years or greater was 11.3 per cent.

menarcheal age among women who have more than one miscarriage. (These women represented only 8 per cent of our study population, yet they accounted for 34 per cent of the miscarriages occurring in first pregnancies.) Although initially we found an association between risk of miscarriage in a first pregnancy and menarcheal age, after removal of "habitual aborters" the only clear pattern remaining was higher risk for women with extremely early or late menarche. Our findings should not be considered conclusive since our data were collected retrospectively, but it should be interesting to compare these results with

the findings of prospective investigations and studies of more diverse populations.

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