

A Population- Based Prospective Cohort Study of Personal Exposure to Magnetic Fields during Pregnancy and the Risk of Miscarriage

D-k Li, R Odouli, S Wi, T Janevic, I Golditch, T D Bracken, R Senior, R Rankin and R Iriye.

(EPIDEMIOLOGY, 2002;Volume 13, pages 9-20)

Abstract: To study the effect of magnetic fields on the risk of miscarriage, we conducted a population- based prospective cohort study among pregnant women within a large health maintenance organization. All women with a positive pregnancy test at less than 10 weeks of gestation and residing in the San Francisco area were contacted for participation in the study. We conducted in-person interviews to obtain information on risk factors for miscarriage and other potential confounders. All participants were also asked to wear a magnet field-measuring meter for 24 hours and to keep a diary of their activities. Pregnancy outcomes were obtained for all participants by searching the health maintenance organization's databases, reviewing medical charts, and telephone follow-up. We used the Cox proportional hazard model for examining the magnetic field-miscarriage association. A total of 969 subjects were included in the final analyses. Although we did not observe an association between miscarriage risk and the average magnetic field level, miscarriage risk increased with an increasing level of maximum magnetic field exposure with a threshold around 16 milligauss (mG). The rate ratio (RR) associated with magnetic field exposure >16 mG (vs<16 mG) was 1.8 [95% confidence interval (CI) = 1.2 - 2.7]. The risk remained elevated for levels (in tertiles) of maximum magnetic field exposure >16 mG. The association was stronger for early miscarriages (<10 weeks gestation) (RR = 2.2, 95% CI = 1.2 - 4.0) and among "susceptible" women with multiple prior fetal losses or subfertility (RR = 3.1, 95% CI = 1.3 - 7.7). After excluding women who indicated that their daily activity pattern during the measurements did not represent their typical daily activity during pregnancy, the association was strengthened; RR = 2.9 (95% CI = 1.6-5.3) for maximum magnetic field exposure >16 mG, RR = 5.7 (95% CI = 2.1-15.7) for early miscarriage, and RR = 4.0 (95% CI = 1.4-11.5) among the susceptible women. Our findings provide strong prospective evidence that prenatal maximum magnetic field exposure above a certain level (possibly around 16 mG) may be associated with miscarriage risk. This observed association is unlikely to be due to uncontrolled biases or unmeasured confounders.