MATERNAL EXPOSURE TO ORGANOPHOSPHATE PESTICIDES, PON1 POLYMORPHISMS AND MISCARRIAGE

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Background and Aims: Although there is evidence from animal studies of impaired reproductive function by exposure to OP, the effects on spontaneous abortion have not been sufficiently evaluated in epidemiological studies. Paraoxonase (PON1) detoxifies organophosphates by cleavage of active oxons. Some PON1 gene polymorphisms could reduce the enzyme activity and increase susceptibility to OP toxicity. The aim of this study was to assess the association between occupational exposure of women to organophosphate pesticides (OP) and miscarriage, and to evaluate the association of PON1 polymorphisms of mothers (PON1_55, PON1_192 and PON1_108) with miscarriage.

Methods: A cross-sectional study was conducted in a population of women resident in communities highly exposed to OP. A total of 313 women, floriculture workers or spouses/couple of floriculture workers, were selected. They all had at least one pregnancy during last 10 years. We obtained information for 534 pregnancies. The PON1_55 and PON1_108 genetic variants were obtained by PCR-RFLP, while the PON1_108 polymorphism was analyzed by RT-PCR.

Results: We did not found a significant association between occupational exposure to pesticides and miscarriage. Concerning PON1 polymorphisms, the risk of miscarriage was twice higher in mothers carrying the PON1_192RR genotype compared to 192QQ genotypes (OR=2.2; 95% CI 0.93, 5.36). The PON1_55 M allele showed a higher risk of miscarriage compared with mothers carrying the PON1_55 LL genotype (OR=4.8; IC95% 1.6–14.2).

Conclusions: These results suggest that women carrying genotypes PON1_192 RR, PON1_55 MM and PON1_55 ML which are exposed to OP have higher risk of miscarriage.