Organochlorine compounds and menstrual cycle function

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We are conducting a study to examine whether women who have been exposed to chlorinated pesticides or PCBs have alterations in their ovarian function as measured by the frequency of menstrual cycle disturbances. Such disturbances may impact the frequency of infertility and sub-fertility, as well as that of other hormone-dependent illnesses such as breast cancer and osteoporosis. The target population is a group of Laotian immigrants who are frequent consumers of fish caught locally in the San Francisco Bay. Contaminant levels above health protective advisories have been documented in Bay fish and shellfish for a number of these substances. Immigration from Asia, as well as consumption of contaminated fish, have been shown to be associated with higher organochlorine pesticide body burdens. Exposure will be determined by measuring serum levels of a panel of pesticide metabolites, including those of DDT, chlordane, hepatochlor and others, as well as PCB congeners. In addition, mercury levels are being measured in the blood. Menstrual function is assessed by measuring urinary metabolites of steroid hormones daily during three menstrual cycles of approximately 50 Laotian women of reproductive age. The participants are also asked to complete two detailed in-person interviews about various factors, including fish consumption.

We have previously conducted a study (WRHS) of menstrual function in a group of 400 women who collected urine daily for an average of 5 cycles. Using these samples we have developed algorithms to determine ovulatory status, day of ovulation and menstrual cycle disturbances such as short luteal phase, which will also be applied to the new sample. This previously collected sample will serve as a baseline comparison group for the current sample. In addition, it will provide a source of data on the effects of lifestyle (such as smoking and alcohol consumption) and demographic (such as age and ethnicity) factors on menstrual function, allowing for more efficient examination of a small group of exposed women in the current study. In addition to serum organochlorine levels, questionnaire measures of exposure (e.g. species-specific fish consumption, occupational exposure and previous residence) will be examined in relation to ovarian function defined as continuous measures (e.g. cycle length, steroid conjugate levels) and dichotomous “abnormalities” (e.g. short luteal phase or anovulation).

An important aspect of working with this refugee, lower socioeconomic status community is to encourage community empowerment through participatory research, which in turn improves trust and cooperation. Steps have been taken to develop partnerships with various community organizations. Staff who spoke one of the three prominent dialects (Mien, Lao, or Khmu) were hired from the local community and have been provided with training to present information about reproductive and environmental health to the community. Participants were recruited at large community events, through adult English classes, medical clinics, colleges and elementary schools, personal contacts, and announcements in native-language media. Over 200 women have been screened for eligibility, which was based on age, place of birth, fish consumption, lack of hormone medications, etc. At this time, we have nearly completed data collection for about 50 women. The measurement of steroid hormones is on-going and exposure measurement will begin soon. Of 62 cycles with completed hormone measurements, very preliminary data (e.g. no adjustment for hormone patterns) indicate 12.9% meet our definition of long cycle (>35 days) (vs. 6.7% in WRHS) and 6.5% have short cycles (<25 days) (vs.

8.7% in WRHS). The mean cycle length is 29.8 days. This concurs with analyses by ethnicity within the WRHS sample, which indicated that Asians were at greater risk of long cycles compared to Whites and had a mean cycle length which was about one day longer. This poster will provide more description of the methods, some results from WRHS and preliminary results from the Lao study group.