CALIFORNIA BIRTH DEFECTS MONITORING PROGRAM

Birth Defects in Lompoc

Since late 1993, the Santa Barbara County Agricultural Commissioner's Office has received complaints about pesticide use near the town of Lompoc. To evaluate community concerns about illnesses and other health symptoms, the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment was asked by the Department of Pesticide Regulation to review available health data for the Lompoc area.

This study, from the California Birth Defects Monitoring Program, looks at birth defects in Lompoc. Residents had not reported any specific concerns about birth defects to Cal/EPA; this is simply one of many possible health outcomes considered.

LOMPOC STUDY DESIGN

We reviewed Lompoc data following a protocol developed to respond to community concerns *(see page 3)*. We examined data from 1987-1989, the years Santa Barbara County was included in the Program's birth defects registry, comparing findings from Lompoc (zip code 93436) to county and registry-wide data for the same period. We evaluated rates of specific conditions, including those which may be linked to pesticides. Finally, we reviewed case information to see if there were patterns suggesting a common underlying cause.

BIRTH DEFECTS NOT INCREASED

We found nothing unusual about birth defects rates or occurrence patterns in Lompoc.

- **Was the overall birth defects rate in Lompoc higher than expected?**

  No. From 1987-1989, there were 40 babies with birth defects among the 2490 live births and fetal deaths to Lompoc residents. This rate—16.1 per 1000 births—is not unusual compared to Santa Barbara County's rate (21.4 per 1000 births) and is lower than the registry-wide average (30.5 per 1000 births) for the same years.

SUMMARY

- Lompoc's overall birth defects rate—16.1 per 1000 births—was not higher than expected.
- Rates of 7 common defects were not unusual.
- There were no patterns among cases to suggest they had a common underlying cause.
- Studying a small area such as Lompoc cannot answer the larger question: Do pesticides cause birth defects? The Program is conducting a statewide study to assess risks from exposure to pesticides in many settings.

■ **Were specific conditions elevated?**

Rates of 7 common defects—heart defects, chromosome abnormalities, pyloric stenosis, oral clefts, limb defects, neural tube defects, and intestinal atresias—were normal compared to both county and registry-wide averages.

■ **What about pesticide-related birth defects?**

Birth defects and pesticides have not been well-studied in humans, and there are no definitive conclusions about risk *(see References)*. Possible links to oral clefts, limb defects, and neural tube defects have been raised—rates for these conditions in Lompoc were not increased.

■ **Were there similarities among cases?**

One of the hallmarks of a teratogen—an environmental cause of birth defects—is that it will produce a distinctive, characteristic pattern of malformations. We reviewed the 40 cases of birth defects in Lompoc to see if there were similarities suggesting a single underlying cause. We found no resemblance between cases.

■ **Are the birth defects in Lompoc related to pesticides or other environmental conditions?**

This question cannot be answered simply by reviewing rates or cases. Finding environmental causes of birth defects requires large well-controlled studies of specific exposures. The California Birth Defects Monitoring Program is conducting a statewide study of pesticides and 4 specific conditions: limb defects, serious heart defects, neural tube defects, and oral clefts. The study looks at many possible routes of exposure to pesticides: home use, occupational use, or residence within 1/4 mile of agricultural fields. Interviews with over 2000 mothers document pregnancy exposures and events. The first study results will be published in 1997.

BIRTH DEFECTS, 1987-1989

RATE PER 1000 LIVE BIRTHS & FETAL DEATHS
(WITH 95% CONFIDENCE INTERVAL)

Lompoc	16.1	(11.5-21.8)
Santa Barbara County	21.4	(19.3-23.7)
Registry-wide Average	30.5	(30.1-30.8)

Note: Small numbers of births create statistical imprecision. Therefore, we consider both the rate and the confidence interval—the most likely range within which the true rate lies. We judge 2 rates to be similar if the rate from the larger population falls within the confidence interval of the other.

ABOUT THIS STUDY

■ Complaints about pesticides began several years after the period studied, 1987-1989, the years Santa Barbara County was part of our birth defects registry. Changes in environmental conditions or birth defects patterns may have occurred since 1989.

■ In our analysis, we grouped all births from Lompoc's zip code, 93436. Given the small numbers involved, we did not compare findings among the 5 census tract groupings used in the other evaluations by the Office of Environmental Health Hazard Assessment. However, plotting the residences of babies born with birth defects yielded no obvious geographic clustering.

- Our conclusions are based on a relatively small number of births, and have limited statistical power. Variation in demographic composition or medical practices can influence rates, complicating comparison to other areas.

REFERENCES

Studies of birth defects in agricultural areas where pesticides are used:

Field B, Kerr C. Herbicide use and incidence of neural-tube defects. *Lancet 1979*; I:1341-1342.

Gordon JE, Shy CM. Agricultural chemical use and congenital cleft lip and/or palate. *Archives of Environmental Health 1981*; 36:213-221.

Schwartz DA, LoGerfo JP. Congenital limb reduction defects in the agricultural setting. *American Journal of Public Health 1988*; 78:654-658.

White FMM, Cohen FG, Sherman G, McCurdy R. Chemicals, birth defects and stillbirths in New Brunswick: associations with agricultural activity. *Canadian Medical Association Journal 1988*; 138:117-124.

EVALUATING SMALL AREAS

Although the California Birth Defects Monitoring Program does not routinely analyze data from small areas such as zip codes or census tracts, we have developed this protocol to respond to specific community concerns about the environment.

The protocol looks for hallmarks seen when an environmental agent has been found to cause birth defects—a dramatic increase in a specific condition, a characteristic pattern of defects, and an exposure in common.

The protocol will uncover major birth defects problems, but generally cannot determine if enviromental conditions are causing birth defects. For this, sizeable studies with accurate exposure information are needed.

Steps for evaluating small areas include:

- Comparing the area's overall birth defects rate to county and registry-wide rates.
- Examining rates of 7 specific birth defects which are common and likely to be uniformly diagnosed statewide: heart defects, chromosome abnormalities, pyloric stenosis, oral clefts, limb defects, neural tube defects, and intestinal atresias.
- Evaluating rates of other conditions if past scientific studies suggest possible links to the environmental exposure of concern.
- Reviewing cases to look for recurring patterns of defects or other similarities.

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