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## Pregnancy Outcomes of Women with Diabetes in Alaska

In 1986, the Section of Epidemiology, Alaska Division of Public Health initiated a statewide Diabetes Control Program in conjunction with and funded by the U.S. Centers for Disease Control. One goal of the program is to prevent complications in women with diabetes who become pregnant. This bulletin reports preliminary results of a study of pregnancy outcomes among women with diabetes in Alaska.

### Background

Pregnant women with diabetes were identified as a subset of individuals in the statewide diabetes database. We developed this database by collecting detailed information on all persons with physician diagnosed diabetes who had been treated at one (or more) of a wide variety of health care delivery sites in Alaska between January 1, 1984 and December 31, 1986. Comparable information was supplied by the Indian Health Service. For each pregnant woman identified, we gathered information on all pregnancies between 1980 and 1988. Women with gestational diabetes were not considered in this analysis.

### Results

During 1980-1988, 40 pregnant women with diabetes were identified in Alaska. Two women had left the state and were lost to followup. Outcomes were known for 42 pregnancies experienced by the remaining 38 women--four each had two pregnancies during the study interval.

Nearly 90% of the women were white (34/38), three were black (7.9%) and one was an American Indian (2.6%). Maternal age ranged from 18 to 39 years, with 32 (76.2%) of the women 20-29 years of age. Thirty-four (90%) of the women had Type I diabetes. Nine (21.4%) of the pregnancies were in primigravidas.

Seventeen pregnancies were complicated by one or more of the following acute maternal complications: Hypo- or hyperglycemia, pregnancy induced hypertension, or diabetic ketoacidosis. These complications resulted in 33 separate hospital admissions for a total of 321 hospital days. Among nine women known to have retinopathy, one progressed to blindness during pregnancy.

Two infants were stillborn--one at 29 weeks gestation had severe congenital malformations including holoprosencephaly and caudal regression syndrome, the second infant was delivered at 20 weeks with death attributed to umbilical torsion.

Neonatal complications experienced by the 40 live born infants included:

- Ten infants with congenital malformations, specifically - patent ductus arteriosus (4), hypertrophic cardiomyopathy (3), and septal hypertrophy, imperforate anus, renal agenesis, displaced penile meatus, bowed tibia, and atrial septal defect (1 each).
- Other complications included: hypoglycemia (21; 50%), macrosomia (10; 25%), respiratory distress syndrome (9; 22.5%), low birthweight (4; 10%), polycythemia (4; 10%), and birth trauma due to shoulder dystocia (3; 7.5%).
- Neonatal intensive care was required for 18 (45%) of the infants--admission averaged 16 days (range 5-48 days). One infant developed necrotizing enterocolitis due to *Staphylococcus epidermis* and another had coagulase negative staphylococcal bacteremia.

### Comments and Recommendations

The complications experienced by these patients is substantial and alarming. The rate and seriousness of congenital anomalies indicates the high risk involved when a woman with diabetes becomes pregnant. Effective medical management of such patients is difficult and usually requires highly specialized experience and training. To reduce the high rate of complications, we recommend:

1. All women of childbearing age with diabetes should be informed of the risks associated with pregnancy. Women who wish to postpone or prevent pregnancy should receive appropriate birth control.
2. Health care providers should work closely with their female patients of child-bearing age with diabetes who wish to conceive in order to achieve euglycemia ideally three months before conception.
3. Pre-natal care should be started as early as possible. A team management approach (including an obstetrician, endocrinologist, ophthalmologist, nurse practitioner, and dietician) is essential for these high risk patients. Blood glucose levels should be meticulously maintained throughout the gestational period.

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