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The care of premature infants in most nurseries entails prolonged physical separation of a mother from her baby. To determine whether this period of separation results in altered maternal behavior we measured feeding performance in a group of mothers who were permitted physical contact with their premature infants (mean b.w. 1,551 g) beginning in the first days of life (Early Contact). Their feeding behavior was compared at the time of discharge and one month later with another group of mothers who first handled their babies (mean b.w. 1,409 g) after 20 days of age (Late Contact). We made 34 time lapse movies of 24 mothers feeding their infants. Mothers' and babies' reactions were analyzed in detail at 1-sec intervals for 10 min of each 15 min filmed. Each frame was scored for twenty five activities ranging from caretaking skills such as the presence of milk in the tip of the nipple to measurements of maternal affection, such as the mother's body touching the infant's trunk (cuddling). Although the amount of time the mothers were looking at their babies was the same in both groups, the Early Contact group had significantly greater 'en face' (mothers' face rotated so that her eyes and those of the infant meet fully in the same vertical plane) 14.8% vs. 5.7% ( $p < 0.05$ ) and also more cuddling 46.3% vs. 21.1% ( $p < 0.025$ ) in the pre-discharge but not the one month feeding. Both of these reflect to some extent the active interest of the mother in her infant. There were no significant differences in measures of caretaking. It is intriguing to consider whether the differences in maternal behavior are due to early initiation of physical contact.

151 *Health of the American Indian: Papago Children.* MORTON S. ADAMS and JERRY D. NISWANDER, Univ. of Rochester, Rochester, N.Y. and Nat. Inst. of Health, Bethesda, Md. (introduced by Philip L. Townes).

The health of the American Indian is a matter of increasing concern. The availability of extensive lineage records, the preservation of traditional cultural factors and the relative absence of miscegenation characterize the Papago tribe of southwestern Arizona. A complete cohort of 134 full-blooded Papago children born between July 1965 and December 1967 and living on reservation were studied with their families. In addition over 900 school children from all parts of the reservation were examined.

The survival of the Papago is dependent upon cultural patterns adaptive in the arid environment of the Southwest. However, this culture carries with it other, less desirable, consequences including (1) a high frequency of several congenital malformations (myelodysplasia and microphthalmia) due to endogamous marriage practices, (2) high mortality and morbidity from infectious disease, (3) normal perinatal development followed by growth retardation, and (4) the early onset of obesity and a high frequency of diabetes mellitus.

This study has suggested modifications of the health care system more compatible with the cultural setting which will lessen the adverse impact of these adaptations on Papago children.

152 *The Offspring of Alcoholic Mothers.* CHRISTY ULLELAND, RICHARD P. WENBERG, ROBERT P. IGO and NATHAN J. SMITH, Univ. of Washington Sch. of Med., Seattle, Wash.

Maternal chronic alcoholism was associated with 41% of infants who were born undergrown for gestational age at King County Hospital during the past two years.

In order to assess the risk of maternal alcoholism on the outcome of pregnancy and subsequent development of the infant, the offspring of 11 alcoholic mothers were followed closely in a special clinic.

Twelve infants (one set of twins) were studied. Ten infants (9 mothers) were undergrown for gestational age (range 34-40 weeks). Except for poor maternal diet, lack of prenatal care (7 mothers), and premature delivery (4 mothers), pregnancies were apparently normal. Five mothers were 35 years old or older. Six were Indian, four Caucasian, and one Negro. Detailed nutritional histories from 7 mothers indicated that 5/7 had deficient diets during pregnancy, 2 of which were severely deficient in both calories and protein.

Eight infants failed to grow, with weight and head circumference remaining below the third percentile. Six of the eight were receiving adequate diets at home for growth, and two infants with a history of poor diet failed to grow normally when hospitalized. Gesell or Denver developmental evaluations were administered to 10 infants. Two were normal, three suspect, and five clearly had retarded development.

These observations indicate that infants of alcoholic mothers are at high risk for pre- and post-natal growth and developmental failure, and suggest that greater attention should be given to alcoholic women during the child bearing years.

153 *A Three-year Follow-up Study of Abused and Neglected Children.* STANFORD B. FRIEDMAN, CAROL W. MORSE and OLLE JANE Z. SAHLER, Univ. of Rochester Med. Center, Rochester, NY.

From 1963 to 1965, 26 children from 24 families were identified as victims of physical abuse or gross neglect. 25 of these children (23 families) were located 2 to 4 $\frac{1}{2}$ /<sub>12</sub> years (median = 2 $\frac{11}{12}$ ) following the incident of abuse. For 21 children, a parental interview was conducted and the child's physical and behavioral status was assessed. In all cases, information regarding each child was obtained from local hospitals and emergency departments, physicians, protective and other community agencies, and when appropriate, from schools.  $\frac{1}{3}$  of the children again had been subjected to abuse or gross neglect, even though 5 children had not been returned home following initial hospitalization. 70% of the children were judged to be developmentally retarded, though often mental retardation or hyperactivity was thought to have preceded the abuse. One or both parents in 18 families exhibited emotional disturbance and/or mental retardation. These and other factors result in a situation in which a child may be identified as being vulnerable to further abuse, and placement outside the home must be considered. Of the methods of intervention examined, the approach of the public health nurse was judged to be most successful.

154 *Psychological Sequelae to Bacterial Meningitis: Two Controlled Studies.* SARAH H.W. SELL, WARREN W. WEBB and JOHN E. PATE, Vanderbilt Univ. Sch. of Med. (introduced by David T. Karzon).

There is a growing suspicion that survivors of bacterial meningitis have deficits which may not become apparent until the children encounter the stress of school. Controlled studies are needed to evaluate such subtle sequelae.