

THE OFFSPRING OF ALCOHOLIC MOTHERS

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From October 1968 through June 1969 we observed six infants at the University of Washington's Harborview Medical Center who had three features in common. First, Each of these infants was born undergrown for gestational age, with a birth weight below the tenth percentile, by Lubchenco's standards. Second, their postnatal growth and development did not proceed at a normal rate. Four were admitted to the hospital in the first six months of life because of failure to thrive and did not grow there in spite of special attention given to their feeding and care. Finally, the mothers of all these infants were chronic alcoholics as defined by Keller's modification of the World Health Organization definition. Alcoholism is defined as a chronic behavioral disorder manifested by repeated drinking of alcoholic beverages in excess of the dietary and social uses of the community and to an extent that interferes with the drinker's health or his social or economic function.

The observation of this triad led us to examine our experience with infants undergrown for gestational age, infants under one year of age who had been admitted to the hospital for failure to thrive, and alcoholic women who had delivered at our institution. The newborn nursery and delivery records were reviewed to identify all undergrown infants born in the 18-month period January 1, 1968, through June 30, 1969. This period included the birthdates of the six index cases. The records of infants less than one year of age hospitalized with a diagnosis of failure to thrive in the same 18-month period were also reviewed. Obstetricians and paramedical personnel in the prenatal clinics were asked to assist in identifying mothers who were alcoholics. These personnel included social workers, public health nurses, and nutritionists who were intimately involved in the pre- and postpartum care of these patients. We asked them to identify known alcoholics who had delivered in the specified 18-month period and any women who were intoxicated when seen in the morning prenatal clinics or during morning home visits by the Public Health Nurse.

Harborview Medical Center serves a low socioeconomic urban population where a number of factors may combine to produce poor fetal and infant performance. During the 18-month period reviewed, there were 1,594 babies delivered at this hospital. Of these, 47, or 2.9% were undergrown (IUFG). This incidence compares closely with the 2.6% of markedly undergrown infants reported by Scott and Usher in their series drawn from all socioeconomic groups. Thirty-seven, or 2.3%, of the infants of nonalcoholic mothers were undergrown. In contrast, ten of the 12 infants born to alcoholic mothers were undergrown (TABLE 1).

The alcoholic woman is frequently difficult to identify. She does not drop out of society and may successfully restrict her drinking habit to the confines of her own home. All of these mothers, whose alcoholism was severe enough to be recognized without investigation, were maintaining homes and raising children with varying degrees of effectiveness. We may have failed to identify some alcoholic mothers who were more successful in organizing their lives and masking their alcoholism. However, even if 90% of the alcoholic women were not recognized by this investigation, a significantly increased incidence of intrauterine

TABLE 1

IUGF INFANTS, HARBORVIEW MEDICAL CENTER
JANUARY 1, 1968-JUNE 30, 1969

	Total Deliveries	Number With Birth Wt <10%	% With Birth Wt <10%
Nonalcoholic Mothers	1582	37	2.34
Alcoholic Mothers	12	10	83.3

p < .0005

growth failure would still be present in association with pregnancy in the alcoholic woman.

The performance of these infants after birth is not distinctly different from other small-for-date babies. Of these 12 infants (ten females, two males, one set of twins) born to 11 chronic alcoholic women, eight currently have weight and head circumferences below the third percentile. Ten of the infants have been evaluated with the Gesell and/or Denver developmental scales. Of these ten, five have retarded development and three are borderline even when corrected for prematurity.

The following are some of the characteristics of our alcoholic mothers. Unlike many mothers of undergrown infants, these women were not young. The youngest was 23 years of age, and five were over 35 years. This relatively advanced age is probably explained by the fact that chronic alcoholism is expected to be more common in later childbearing years. The parity of these women was also high. Only one was primiparous, and eight had four or more pregnancies. Only one of the women had toxemia, which was mild. This is consistent with the age and parity of the mothers. Only four of these mothers received any prenatal care. In contrast to this, 85% of the women who deliver at Harborview Medical Center have three or more prenatal visits.

The racial distribution of these mothers is distinctly different from our usual clinic population. Approximately 40% of the mothers delivered at our hospital are black and only 5% are Indian. Among the other 37 undergrown newborns only two, or 5% were born to Indian mothers.

Two of the mothers were heavy smokers, that is, smoked more than 30 cigarettes a day. Five had never smoked. Three of these women had biopsy proven Laënnec's cirrhosis. Information of this type is not available in the other eight alcoholic women or in the clinic population at large.

Finally, considering nutrition might be the difference between the poor alcoholic and her nonalcoholic counterpart, we obtained detailed information on seven mothers (TABLE 2). Dietary history by recall suggested that five of the seven mothers had moderate to severe deficiencies, either in protein or in calories, or both, during their pregnancies. Three admitted to consuming 25% or more of their daily caloric intake in the form of alcohol. Laboratory study, which included tests for hemoglobin, red cell indices, total serum protein, albumin, and globulin, and the assay of various vitamins in blood or urine, did not indicate the presence of specific vitamin deficiencies, except in one mother, who had serum folate less than 4 micrograms percent. One had slightly decreased serum albumin. Five had increased globulin with normal albumin, which

TABLE 2
MATERNAL CHARACTERISTICS

Age	Youngest 23 years	Five older than 35 years
Parity		1 - Primiparous 2 - 2 deliveries 8 - 4 or more deliveries
Toxemia		1
Prenatal care		7/11 no prenatal care
Race		
1 Black		
4 White		
6 Indian		
Smoking		2 heavy 5 never smoked
Laënnec's cirrhosis		3/11
Nutrition		
Diet during pregnancy (history)		
	Moderate	Severe
Protein-deficient	2	2
Calorie-deficient	1	3
Laboratory		
Folate-deficient	1	
Low serum albumin	1	
↑ Globulin (→ A/G reversal)	5	

is more consistent with liver changes of chronic alcoholism than with malnutrition. The laboratory studies were done some months postpartum; however, dietary histories did not differ at this time from those obtained during pregnancy or immediately postpartum.

In summary, we have presented a group of infants with intrauterine growth failure whose mothers had one thing in common: that is, relatively severe chronic alcoholism. Viewed another way, intrauterine growth failure occurred in 83% of the offspring of women whose alcoholism was readily recognized. We have not determined the cause of the intrauterine growth failure we have found to be associated with maternal alcoholism. However, it appears that the coexistence of pregnancy and chronic alcoholism ought to alert physicians to a high-risk situation.

Chronic alcoholism can be appropriately added to the list of maternal factors that create an unhealthy intrauterine environment for the developing fetus; the consequences of which may be lifelong.