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Three Fetal Alcohol Syndrome case reports are presented, as well as results from animal studies with a description of the pathogenesis.

The Effect of Maternal Alcohol Consumption During Pregnancy

BARBARA WILLIAMS, M.D., *Atlanta**

Historical Background

THE DELETERIOUS effects of maternal alcohol consumption on the fetus have long been recognized. The early Carthaginians recognized this and thus forbade alcohol to newlyweds to prevent conception of malformed children. In 1621, in *The Anatomy of Melancholy,* Burton quotes Aristotle: "Foolish and drunken and harebrained women most often bring forth children like unto themselves, morose and languid." The Gin Epidemic in England in the first half of the 18th Century caused the College of Physicians to appeal to Parliament for tighter controls on alcohol, stating that parental drunkenness was "a cause of weak, feeble, and distempered children." Sullivan, at the turn of the century, studied 120 female alcoholic inmates in the Liverpool jail and found a perinatal mortality rate 2.5 times greater than that of their non-drinking female relatives.[1]

In America, after the repeal of Prohibition, there was a general rejection and ridicule of these earlier observations. In 1955, the Yale Center for Alcohol Studies released a pamphlet stressing that "the old notions about children of drunken parents being born defective can be cast aside."[2] The 1975 edition of Goodman and Gilman's Pharmacology text has the statement that "alcohol gains free access to the fetal circulation but it does not seem to harm the fetus."[3]

In 1967, Fuchs demonstrated the effect of alcohol on inhibiting uterine contractions in threatened premature labor.[4] The subsequent widespread use of such therapeutic infusion of ethanol, which is known to be readily transferred to the fetus by the placenta,[5] stimulated research on the effects of ethanol on the fetus.[6-10]

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Morphologic Characteristics of Fetal Alcohol Syndrome

In 1973, Jones and Smith described for the first time in the United States a recognized pattern of multiple congenital anomalies with microcephaly, short palpebral fissures, cardiac anomalies, and prenatal onset of retardation of growth and development.[11] Similar morphologic characteristics had been observed by Lemoine in France among 25 children of chronic alcoholics.[12] Figures 1[11] and 2[11, 13] show the characteristic hand and facial malformations associated with the Fetal Alcohol Syndrome (FAS). The principal features of FAS are listed in Table 1 with the frequency of observation found among the 41 children studied by Hanson, Smith, and Jones[13] compared with three children determined to have FAS at Grady Memorial Hospital in November 1977. These latter three children will be presented in this paper as a confirmation of earlier descriptions of FAS and in order to more fully delineate some deviation from the now recognized syndrome.

Case Reports

Case #1: Baby T., a 1550-gram female, with a gestational age of 34 weeks, was born to a 31-year-old woman. The mother had a history of chronic alcoholism of 8 years duration. She had been hospitalized or seen in the medical emergency clinic on various occasions, both prior to and during early pregnancy, for alcoholic hepatitis and alcoholic gastritis. She admitted drinking at least 1 pint per day of moonshine or package store liquor in the first 13 weeks of pregnancy.

Prenatal growth deficiency was demonstrated in her infant, with a birth weight and birth length at the

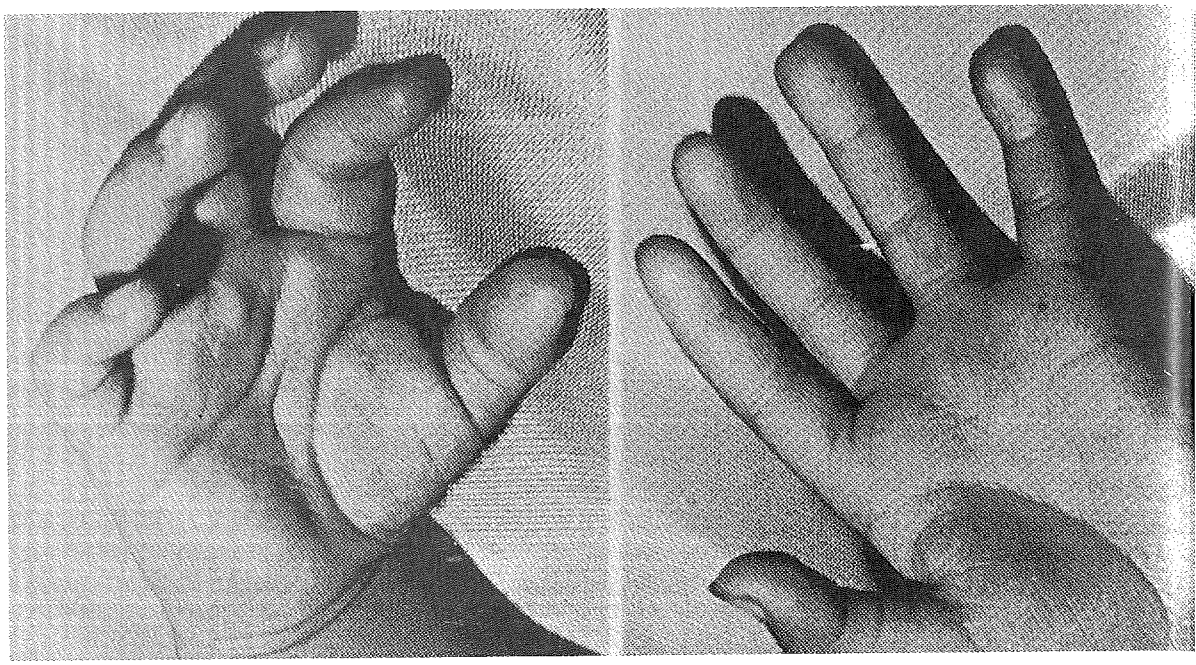

Figure 1 — Aberrant palmar crease patterns are characteristic of FAS.[11]

50th percentile for 29½ and 30 weeks gestation, respectively. Head circumference, however, was normal for 34 weeks. Microphthalmia, micrognathia, abnormal palmar creases, jitteriness, and hypoplastic labia majora were among the more common findings of the syndrome found in this newborn. In addition, hypoplastic ribs with a flail chest and hydronephrosis and hydroureter of the right kidney were also present. Renal anomalies have only recently been described in this syndrome, although the earlier case descriptions did not mention whether or not renal studies were done on the patients.[4] This infant was also found to have bilateral cataracts.

Case #2: Baby W., an 1100-gram male with a gestational age of 32 weeks, was born to a 39-year-old multiparous woman with a history of two miscarriages, and six previous premature births. In the past 8 years, the mother had presented to the medical emergency clinic on frequent occasions with trauma secondary to ethanol intoxication and alcoholic gastritis. Several of these occasions occurred during early pregnancy with this infant. Birth weight and birth length were both markedly deficient, at the 50th percentile for 27 weeks and 26 weeks gestation, respectively. Head circumference was 50th percentile for 28 weeks gestation. Common FAS dysmorphogenesis noted in this baby included microcephaly, microphthalmia, micrognathia, classic palmar creases, clinodactyly, hemangiomata, and jitteriness. Additionally, a ventricular septal defect was diagnosed, the most common cardiac defect found in children with FAS. This baby also had a cleft palate and eventration of the diaphragm.

Case #3: R.B., a 2½-year-old boy, was adı to the hospital for a seizure disorder, and was to have unusual facies consisting of microce microphthalmia, esotropia and ptosis of the eye, severe myopia and retinal degeneration, gated philtrum, classic palmar creases bisecti first and second fingers, incomplete extens both elbows, and low-set ears. He had prenat postnatal growth deficiency in birth lengt weight, and subsequent height and weight urements well below the 3rd percentile, n retardation of both motor and intellectual fur At birth, he had been noted to be jittery, and right diaphragmatic eversion. Catheterizati vealed valvular pulmonic stenosis, a cardiac noted in only one other published case of I Investigation revealed that his mother was a c alcoholic with multiple hospital admissions. S died of cardiorespiratory arrest during an alc withdrawal seizure when the child was 2 ye age, 8 months after he had been removed fr custody and placed in a foster home.

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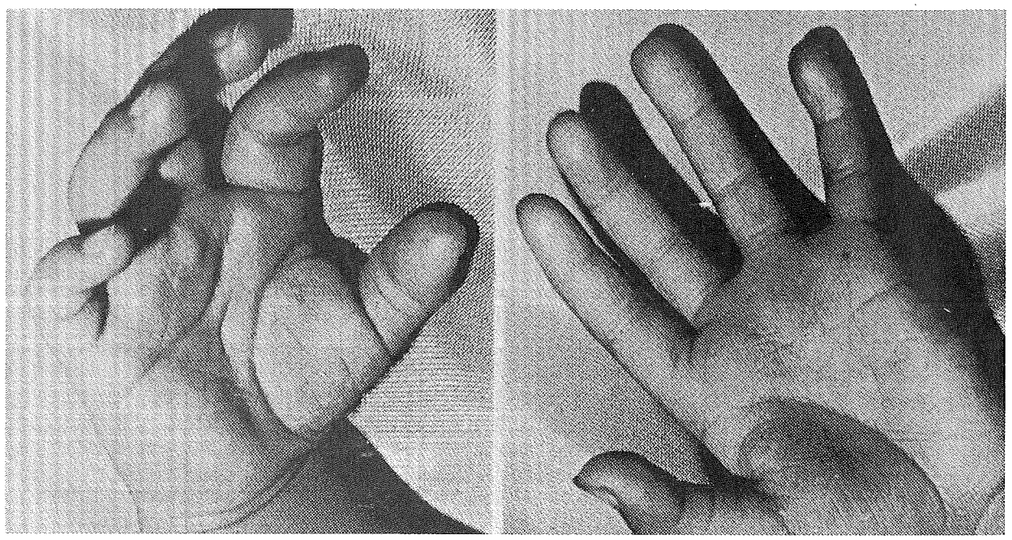

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The average alcohol consumption may not be as important as the maximum blood alcohol concentrations obtained during binge drinking . . . in the first trimester.

A high blood alcohol level during a critical time of embryonic development probably is necessary to produce the full symptomatology of FAS. The average alcohol consumption may not be as important as

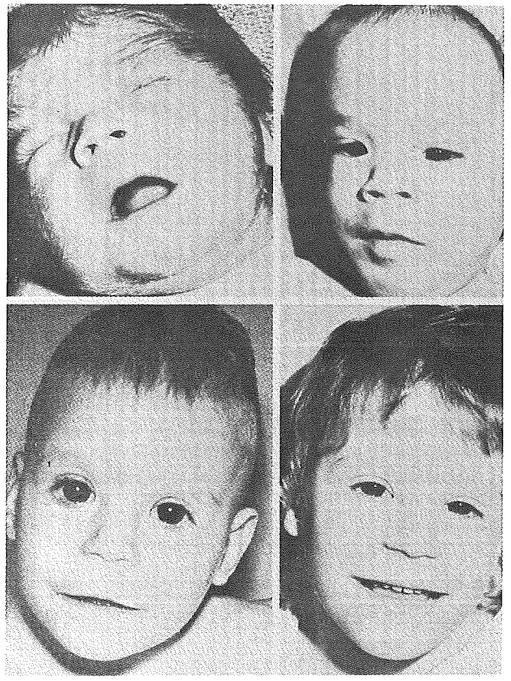

Figure 2 — Top: Boy with FAS at birth (L)[11] and at 6 months of age (R). Bottom: Girl with FAS at 16 months of age (L) and at 4 years (R).[13] Note short palpebral fissures, low nasal bridge with short or upturned nose, epicanthic folds, mid-face hypoplasia, and long convex upper lip with narrow vermilion border. A narrow bifrontal diameter, ocular ptosis, strabismus, wide mouth, prominent ears, and decreased periocular zone of hair inhibition are also common features.

the maximum blood alcohol concentrations obtained during binge drinking at critical periods in the first trimester. During the third trimester, it is more likely a chronic blood alcohol level that leads to pre- and postnatal growth deficiency and perhaps to some aspects of mental retardation. Animal models are necessary in order to control the multiple variables such as nutritional intake, caffeine, and nicotine consumption which so frequently accompany excessive alcohol intake in humans.

Results of Animal Studies

Despite the inevitable limitations of generalizing findings from animal studies to humans, the ability to control multiple variables which produce a compound obstetric risk make animal studies necessary and invaluable in studying the effect of varied amounts of alcohol on the fetus. To date, there is an animal model of the fetal alcohol syndrome in the chicken, mouse, rat, guinea pig, and zebra fish. Comparisons between humans and other animal species can best be made on the basis of blood alcohol concentrations, which is most critical in the mediation of the adverse consequences, and controls for differences in pathways and rates of alcohol metabolism among species.

St. Sandor[16] studied the effects of ethanol first in chick embryos, and later in albino rat fetuses. Early maldevelopment and mortality occurred in a considerable portion of the embryos, and the remaining subjects showed considerable and significant loss of

TABLE 1 — Common Abnormalities in Fetal Alcohol Syndrome

Abnormality	Number Affected	Number Observed	(%)[11]	Grady Memorial Hospital Case Reports #1	#2	#3
Growth and Performance						
Prenatal Growth Deficiency	38	39	(97)	+	+	+
Postnatal Growth Deficiency	37	38	(97)	+	+	+
Developmental Delay; Mental Deficits	31	35	(89)	?	?	+
Fine Motor Dysfunction	28	35	(80)	+	+	+
Craniofacial						
Microcephaly	38	41	(93)	−	+	+
Short Palpebral Fissures	35	38	(92)	+	+	+
Midfacial Hypoplasia	26	40	(65)	+	+	−
Epicanthic Folds	20	41	(49)	+	+	+
Limb						
Abnormal Palmar Creases	20	41	(49)	+	+	+
Joint Anomalies (minor)	17	41	(41)	+	+	+
Other						
Cardiac Defect	20	41	(49)	−	+	+
External Genital Anomalies	13	41	(32)	+	−	−
Hemangiomata	12	41	(29)	−	+	−

+ = present.
− = absent.
? = undeterminable.

weight toward the end of incubation. The central nervous system seemed to be the most sensitive organ. In the albino rats, St. Sandor found that 2 g/kg intravenous alcohol induced twice the number of abnormalities as 1.5 g/kg and that two heavy intoxications were more injurious than three lighter ones. Effects on the bones were most apparent in the extremities and facial areas, the same regions as observed in human infants with FAS.

The most dramatic effect of maternal alcohol consumption on the fetus is seen in the central nervous system.

Chernoff[17] administered alcohol orally to two strains of mice differing in ethanol preference and alcohol dehydrogenase activity. Blood alcohol levels of 73% to 398% were achieved, equivalent to 3 ounces of absolute alcohol for 73 mg% blood alcohol concentration in man. Chernoff found a definite growth deficiency due to ethanol, with fetal abnormalities involving skeleton, brain, heart, and eyes, similar to that of FAS in humans. The rat strain with the lower alcohol dehydrogenase activity was more sensitive to the effects of alcohol, which is significant in the light of recent studies which show ADH to be an isoenzyme, with human fetuses having only one of these isoenzymes present in the liver prior to 20 weeks gestation, with an enzyme activity level only 3-4% that of the adult liver.

Kronick[8] in 1976 administered varying levels of ethanol to pregnant mice and established a dose response curve, with fetal death occurring in response to the highest maternal doses, and varying degrees of growth deficiency and malformations occurring with lower doses. The animal studies are quite compelling and clearly suggest a risk for fetal outcome in humans when alcohol consumption is 3 to 4 ounces or more of absolute alcohol per day, i.e. six to eight drinks. It is to be emphasized that it is not necessary to achieve this level on a chronic basis to have dysmorphogenesis, but binge drinking achieving this level on any number of days prior to day 85 of pregnancy has the risk of producing such a syndrome.

As to the pathogenesis of alcohol on the fetus, it is known that alcohol equilibrates rapidly across the placenta, and that maternal alcohol that has been degraded to aldehyde is oxidized by placental enzymes before entering fetal blood. Because of the immaturity of fetal enzymes, the fetal blood alcohol level falls at only one-half the rate of the mother, giving rise to the possibility of achieving greater concentrations in fetal blood, as well as having a greater period of time in which to affect the fetus. Ethanol in fetal blood induces severe acidosis and hypoxia,[18] with the most fundamental effects of ethanol being at the level of the cell membrane and the mitochondria, with impaired function of the ATP-activated Na^+-transport system, and impairment of mitochondrial oxidation of fatty acids to carbon dioxide. It also has profound effects on carbohydrate, lipid, and protein metabolism, with decreased rates of leucine incorporation. Decreased levels of ribosomal protein content and total RNA content has been found in fetal livers exposed to ethanol in utero.[19]

The most dramatic effect of maternal alcohol consumption on the fetus is seen in the developing central nervous system. Autopsies were performed on eight offspring exposed to heavy alcohol concentrations in utero. Six of the brains showed widespread malformations resulting from migratory failure of neuronal and glial cells, resulting in multiple heterotopias. The anterior superior gyri were fused through leptomeningeal infiltration, and the cerebral cortex was incompletely developed with relative agyria and large lateral ventricles. Agenesis of the corpus callosum was found, a finding also present in the animal models exposed in utero to ethanol. Some of the structural and functional abnormalities in the fetal alcohol syndrome, such as microcephaly, mental deficiency, and fine motor dysfunction, as well as some of the joint anomalies, may all be secondarily related to the malorientation of the brain caused by the migratory failure described.[20]

Any woman at risk of becoming pregnant should be educated as to the effects of alcohol on the fetus.

Summary

The research on the impact of maternal alcohol consumption on human infants has demonstrated that FAS is clinically observable, with the primary characteristics of pre- and postnatal growth and developmental deficiency, microcephaly, microphthalmia, and cardiac defects.

Because factors other than alcohol, such as nicotine, caffeine, and nutritional intake of vitamins, protein, and trace metals may confound human studies, animal studies have been invaluable. The evidence from the animal studies clearly suggests a risk for adverse outcome of a pregnancy during which alcohol consumption exceeds three ounces of alcohol per day, the equivalent of six drinks, a not uncommon quantity of alcohol among many pregnant women. Further animal experiments must be undertaken to assess the possible risks at lower doses, and longer prospective human studies are necessary to clarify a statistically significant risk

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The relevance of the recognition and understanding of the fetal alcohol syndrome in the field of obstetrics is obvious. It is important to counsel patients who are known to be chronic alcoholics regarding the risks of pregnancy. Additionally, because the major teratogenic effects of alcohol take place prior to the recognition of pregnancy in many cases, and because binge drinking as well as chronic alcohol consumption can be deleterious, any woman at risk of becoming pregnant should be educated as to the effects of alcohol on the fetus.

While the incidence of fetal alcohol syndrome is at present unknown, conservative estimates show that there are at least one million alcoholic women in the United States, many of child-bearing age. As early as the 1960's, an estimated 21% of women experienced moderate drinking problems, and 4% experienced severe problems. With the markedly increased incidence of alcoholism among teenagers over the last decade, the problems of fetal exposure to the adverse effects of alcohol should not be underestimated.

References

1. Rosett HL: Effects of maternal drinking on child development: an introductory review. Ann NY Acad Sci 273:115-117, 1976
2. Streissguth AP: Maternal drinking and the outcome of pregnancy: implications for child mental health. Am J Orthopsychiat 47(3):422-431, 1977
3. DeBeukelaer MM, Randall CL: Renal anomalies in the fetal alcohol syndrome. J Pediat 91(5):759-760, 1977
4. Fuchs F, Fuchs A-R, Poblete VF, Risk A: Effect of ethanol on threatened premature labor. Am J Obstet Gynecol 99(5):627-631, 1967
5. Mann LI, Bhakthavathsalan A, Liu M, Makowski P: Placental transport of alcohol and its effect on maternal and fetal acid-base balance. Am J Obstet Gynecol 122(7):837-844, 1975
6. Chernoff G: A mouse model of the fetal alcohol syndrome. Teratology 11:14A, 1975
7. Dilts PV: Effect of ethanol on maternal and fetal acid-base balance. Am J Obstet Gynecol 107(7):1018-1021, 1970
8. Kronick JB: Teratogenic effects of ethanol administered to pregnant mice. Am J Obstet Gynecol 124(7):676-680, 1976
9. Mann LI, Bhakthavathsalan A, Liu M, Makowski P: Effect of ethanol on fetal cerebral function and metabolism. Am J Obstet Gynecol 122(7):845-851, 1975
10. Rawat AK: Effect of maternal ethanol consumption on fetal and neonatal rat hepatic protein synthesis. Biochem J 160:653-661, 1975
11. Jones KL, Smith DW, Ulleland CN, Streissguth AP: Pattern of malformation in offspring of chronic alcoholic mothers. Lancet 1:1267-1271, 1973
12. Lemoine P, Haronsseau H, Borteryu JP, Menuet JC: Les enfants de parents alcoholiques: anomalies observees a propos de 127 cas. (Children of alcoholic parents: anomalies observed in 127 cases.) Quest Med 25:476-482, 1968
13. Hanson JW, Jones KL, Smith DW: Fetal alcohol syndrome: experience with 41 patients. JAMA 235:1458-1460, 1976
14. Jones KL, Smith DW, Ulleland CN, Streissguth AP: Pattern malformation in offspring of chronic alcoholic mothers. Lancet 1:1267-1271, 1973
15. Mulvihill JJ, Klimas JT, Stokes DC, Risemberg HM: Fetal alcohol syndrome: seven new cases. Am J Obstet Gynecol 125:937-941, 1976
16. Sandor S, Amels D: The action of aethanol on the prenatal development of albino rats. Rev Roum Embryol Cytol (Ser Embryol) 5:51-76, 1968
17. Chernoff G: A mouse model of the fetal alcohol syndrome. Teratology 11:14A, 1975
18. Pikkarainen PH, Raiha NCR: Development of alcohol dehydrogenase activity in the human liver. Pediat Res 1:165-168, 1967
19. Rawat AK: Effects of maternal ethanol consumption on fetal and neonatal rat hepatic protein synthesis. Biochem J 160:653-661, 1975
20. Jones KL, Smith DW: Recognition of the fetal alcohol syndrome in early infancy. Lancet 2:999-1001, 1973

Statewide Conference for Hospice Movement

In response to the interest expressed in the Hospice movement, a statewide conference is planned for October 14, 1979, at St. Joseph's Hospital in Atlanta. The purpose of the conference is to bring together those involved in hospices throughout the state to discuss common interests and needs with the ultimate goal of forming a statewide organization. This conference will feature presentations by Melvin Moore, M.D., an oncologist at Grady; Vernon Gramling, Director of the Grady Hospice; L. C. Buchanan, M.D., a surgeon from DeKalb County; Mary Ann Hagler, M.D., Medical Director of the hospice in Augusta; Robert Cowgill, M.D., Medical Director of Hospice Atlanta; and Erma Lee Shephard, Ph.D., a clinical psychologist. For more information, contact Marea Jo Bickley, at 404/233-8053 or 404/255-8527. Address: Hospice Atlanta, Inc., P.O. Box 8376, Atlanta, GA 30306.