

The Discovery of Fetal Alcohol Syndrome

The term Fetal Alcohol Syndrome (FAS) was first published in a 1973 article in the British medical journal *The Lancet*. In that article, a group of pediatricians and psychiatrists at the University of Washington Medical School helped to define the morphological defects and developmental delays that can affect children born to alcoholic mothers. Those observations include pre- and post-natal growth deficiencies, minor facial abnormalities, and damage to the developing brain that can result in behavioral, learning, and cognitive abnormalities.

Other teratogens responsible for birth defects such as thalidomide and rubella (German measles) had been identified prior to that time; however, the medical community did not consider alcohol a danger to normal embryonic development prior to the publication of the 1973 article. That benign view of alcohol consumption during pregnancy reflected the intersection between medical knowledge and socio-cultural forces that shaped the knowledge during that time. The time period in which FAS was classified influenced the definition and discovery of the defects.

The reproductive revolution of the 1960s included the wide-spread use of oral birth control pills. That revolution helped prompt a cultural shift in the relationship between men and women with regards to fertility, pregnancy, and parenthood. The 1973 US Supreme Court decision *Roe vs. Wade* and the subsequent legalization of abortion in the US influenced the definition of FAS. The contentious social and medical issues surrounding abortion introduced the concept of fetal rights and prompted discussion of what role society should have in regulating reproductive issues.

The temperance and eugenics movements of the late nineteenth and early twentieth centuries further complicated the history of alcohol in the US and its social relation to reproduction. During those movements, alcohol was linked to so-called hereditary damages that were passed down between generations, and was thought to result in heritable imbecility, which the eugenics movement sought to regulate. The wide-spread belief that alcohol consumption by men and women predisposed their offspring to social vice was one reason why the temperance movement gained such prominence in the early twentieth century.

With the repeal of Prohibition in 1933, concerns of how alcohol impacted development gradually began to disappear from the US social consciousness. Alcohol went from a vilified and harmful poison to a more benign agent, and was even thought to have beneficial effects. Doctors in the mid-twentieth century recommended alcohol as a means of social relaxation and intravenous alcohol treatments were even used to delay preterm labor in some women.

The thalidomide scare of the 1950s and 1960s occurred after numerous children were born with severe appendicular defects to women who had taken thalidomide as a morning sickness remedy during pregnancy. The thalidomide scare began to highlight how an agent introduced during pregnancy could impact fetal development. Rather than external agents having an impact on development, teratogens began to be defined as agents that could impact fetal development at any stage of gestation. That explanation was further confirmed by fetal-focused increases in medical technology, including ultrasounds and fetal monitoring. The discovery of FAS was not so much an empirical exercise in recognizing a relationship that was unnoticed prior to the 1950s as it was a reflection of medical understanding of the time.

Important to the classification of FAS in the US were David W. Smith and Kenneth L. Jones, pediatricians that specialized in dysmorphology at the University of Washington's medical school. Dysmorphology is the study of congenital abnormalities that arise during development. The creation of March of Dimes and other organizations that brought problems of birth defects into the public

sphere fueled the burgeoning field of dysmorphology in the early 1970s. At that time, Smith was a professor of pediatrics and an influence in the growing field of researching birth defects. Jones was completing his residency in dysmorphology under Smith.

In 1973, Smith and Jones examined a group of eight children at the University's Harborview Medical Center to try to determine what caused their developmental delays. During initial visits, four of the eight children were observed with similar growth deficiencies, abnormally small heads (microcephaly), and delays in cognitive development. The common factor uniting those children was that their mothers were alcoholics. Smith and Jones suspected that alcohol might be acting as a teratogen, and causing the developmental defects observed in the children.

Despite prevailing medical opinion to the contrary, Smith and Jones began to accumulate case studies of children born to alcoholic mothers in order to expand the cohort of affected individuals. The two physicians enlisted the help of fellow University of Washington residents, psychiatrist Ann P. Streissguth and pediatric physician Christy N. Ulleland. Streissguth worked to clarify the cognitive abnormalities of affected children. Ulleland had published an article in 1972 titled "The Offspring of Alcoholic Mothers". Ulleland described case studies of children born to alcoholic mothers between 1968 and 1969. A total of twelve children had been observed with pre- and post-natal growth deficiencies, often classified as failure to thrive, and mental disabilities. The children she had examined for her paper Smith and Jones reexamined for the features of FAS.

In 1973, Smith, Jones, Ulleland, and Streissguth submitted their findings, "Pattern of Malformation in Offspring of Chronic Alcoholic Mothers" to *The Lancet*. The journal rushed normal process of peer review and revision, presumably due to the importance of the study, and news of the paper's acceptance for publication arrived a mere week after it had been submitted. The journal published the article in June of 1973. The article discussed morphological abnormalities, cognitive defects, and growth deficiencies observed in children whose mothers heavily consumed alcohol during pregnancy. Both male and female children from three different ethnic groups were included in the examination, ranging in age from eleven weeks to four years.

Five months later, Jones and Smith published a second article in *The Lancet*, "Recognition of the Fetal Alcohol Syndrome in Early Infancy". In that article the authors presented a historical survey of anecdotal associations between prenatal alcohol abuse and the effects of FAS. The authors presented an additional three case studies of children affected by FAS in the article. That article was also the first to introduce a survey of the gross morphological defects affecting the central nervous system.

In June of 1974 Smith, Jones, Streissguth, and Ntinios C. Myriantopoulos published a third article in *The Lancet*, "Outcome in Offspring of Chronic Alcoholic Women". In that article, case studies collected in the Collaborative Perinatal Project, which began in 1959, were closely examined for evidence that children born to alcoholics suffered from the characteristics of FAS. The National Institute of Neurological Disorders and Stroke funded the project which had previously been surveyed to help determine if thalidomide was a teratogen. Among the 55,000 women included in the Collaborative Perinatal Project, alcoholism was only recorded in the medical charts of twenty-three. That was because in the 1970s alcohol was considered benign to fetal development. Although none of the children were formally examined in the project, a significant correlation was noted between maternal alcohol consumption and perinatal mortality or severe birth defects. The article ended with the suggestion that chronic alcoholics should be counseled as to whether abortion was a viable option in light of those severe birth defects.

In the interim, Jones learned of the research that had been conducted by Paul Lemoine in Nantes, France in 1968. Jones contacted Lemoine in order to discuss the research, which consisted of the examination of 127 children from 69 French families with chronic alcoholism noted in at least one parent. Among the children observed, the facial abnormalities described bore a striking similarity to those catalogued by Smith and Jones. The children examined also displayed a range of cognitive defects that manifested as low IQ, hyperactivity and developmental delays in motor coordination and language skills. Despite its publication five years prior to the observations made by Smith and colleagues, the article was largely unrecognized in both France and medical communities abroad.

Both Jones and Lemoine followed their initial cohorts into adolescence to ascertain the long-term

effects of FAS. Among the eleven original children examined by Jones and colleagues, four were severely mentally handicapped and another four were moderately mentally handicapped. Two of the original children had died and the last could not be contacted. Of Lemoine's original 127 children, 105 had been institutionalized as a result of psychological issues or mental handicaps.

Later laboratory analysis of animal models helped to define how alcohol functions as a teratogen, and the developmental timeline of alcohol's teratogenic effects. In 1988 a US federal-level Surgeon General's warning was issued that cautioned against drinking when pregnant, and was required to be displayed on all alcoholic products. Since then various state-level alcoholic regulations and court cases have arisen surrounding the Surgeon General's warning. Some mothers who drink during pregnancy have been charged with reckless endangerment, child abuse, or attempted homicide. The discovery of FAS presented the need to redefine how society perceives its role in regulating drinking when pregnant, a relationship that continues to be defined today.

Sources

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