An Historically Hidden Health Problem: Alcohol and Pregnancy

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Overview

For most of the 20th Century, alcohol was considered to be safe to drink at anytime and any level during pregnancy. We now know that this view was wrong. By the mid-1970s a birth defects disorder attributable to prenatal alcohol had been recognized in both France and the U.S., and our perspective on the safety of alcohol in pregnancy began to change.
This Birth Defect was named Fetal Alcohol Syndrome

FAS was characterized by three key features:

• A specific pattern of facial features
• Growth deficiency
• And the presence of brain or neurobehavioral deficits – subsequently noted to fit a characteristic pattern

Photo courtesy of Teresa Kellerman
Face of Fetal Alcohol Syndrome

Cardinal Features

- Short palpebral fissure
- Elongated & Hypoplastic philtrum
- Thin upper vermilion lip border (hypoplastic “cupid’s bow”)

Associated Features

- Low nasal bridge
- Epicanthal folds
- Minor ear anomalies
- Micrognathia
OTHER PHYSICAL FEATURES OF FAS FEATURES

Renal
Cardiac
Skeleton
Eyes/Ears

.....and other minor abnormalities
CNS Deficits in FAS

**Physical and Neurophysiological:**
- Sm Head Circumference < 10th
- Structural Abnormalities
- Hearing/Visual abnormalities
- Fine and Gross Motor Deficits

**Cognitive:**
- Global Intellectual Impairment
- Learning Problems
- Executive Functioning Deficits (Planning; Abstract reasoning)
- Math Deficits > Language Memory Deficits
- Poor Visual Spatial Abilities

**Impaired Behavioral Regulation:**
- Impulse Control Problems
- Attention Problems
- Mood or Behavioral Regulation
- Perseveration

**Deficits in Adaptive Functioning:**
- Communication Issues
- Poor Social Skills
- Problems with Daily Living
- Motor Challenges
Fetal Alcohol Spectrum Disorders

- It did not take long before researchers began to notice that there were children with a history of prenatal alcohol exposure who showed the neuro-behavioral deficits without having the facial features of FAS.

- Several terms were proposed over the next years to refer to these individuals, such as, Partial FAS (pFAS) and Alcohol Related Neurobehavioral Disorder (ARND).

- By the early 2000s, the term Fetal Alcohol Spectrum Disorders (FASD) was introduced to cover the full range of deficits arising from prenatal alcohol exposure.
# Epidemiology: Current Evidence on the Prevalence of FAS and pFAS in Select Locations (Countries)

<table>
<thead>
<tr>
<th>Location (Reference Year)</th>
<th>FAS* (FAS+pFAS) Rate per 1000</th>
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<tbody>
<tr>
<td>United States: Mid-Western City (May et al. October 2014)</td>
<td>6 – 9 (17 – 26) FASD (+ ARND) = 21 – 48</td>
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<tr>
<td>Italy; Lazio Region (May et al. 2007)</td>
<td>4 – 9 (27 – 55)</td>
</tr>
<tr>
<td>Croatia: Urban Region (Petkovic et al. 2010)</td>
<td>6 (41)</td>
</tr>
<tr>
<td>Croatia: Rural Region (Petkovic et al. 2013)</td>
<td>17 (67)</td>
</tr>
<tr>
<td>Poland (Okulicz, et al. 2015)</td>
<td>4 (12) FAS + pFAS (+ ARND) = 20</td>
</tr>
<tr>
<td>South Africa: Western Cape (May et al. 2009)</td>
<td>51 – 67 (68 – 90)</td>
</tr>
<tr>
<td>South Africa: Northern Cape (Urban et al. 2008)</td>
<td>67 (75-119)</td>
</tr>
<tr>
<td>NW Australia: Fitzroy Valley (Fitzpatrick, et al. 2015)</td>
<td>120</td>
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</tbody>
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All obtained from In School Active CaseAscertainment

*IOM 1996 prevalence estimated in U.S. for FAS at 0.5 – 2 per 1000
Misconception on Alcohol Safety in Pregnancy

Given its high prevalence, why were we so unaware of the risk of alcohol in pregnancy for so long in the 20th Century?

There appears to be two primary reasons:

1. Rejection of knowledge on risks from drinking in pregnancy that had existed before Prohibition;

2. Lack of medical familiarity with the pattern of deficits that would become known as fetal alcohol syndrome so that:
   • The deficits would go undiagnosed,
   • Or, not attributed to the causal agent, alcohol.
Some Early Observations on Alcohol and Pregnancy

- But there were early historical indications that societies were aware of the dangers of alcohol in pregnancy.
- One of the earliest occurred almost 300 years ago during the London Gin Epidemic in the years 1690 – 1752.
- On 19 January 1725, the London College of Physicians partitioned the House of Commons stating:

A Ginnery (etching)
We... do think it our Duty most humbly to represent that we have with concern observed, for some years past, the fatal effects of the frequent use of several sorts of distilled Spirituous Liquors... and too often the cause of weak, feeble, distempered children, who must be instead of an advantage and strength, a charge to their Country.
Henry Fielding, Esq.

- But the Gin Epidemic continued for 25 more years when several social commentators brought additional attention to the issue.

- Among them was Henry Fielding in *An enquiry into the causes of the late increase of robbers...with some proposals for remedying this growing evil*. London: A. Millar; 1751.

- He wrote: “What must become an infant who is conceived in Gin? With the poisonous distillations of which it is nourished, both in the Womb and at the Breast” -- 1751 quote of Henry Fielding.
GIN LANE
William Hogarth
1751
Depiction of the London Gin Epidemic

Pawn shop, coffin maker and ginneries prospering

Man hanging from rafters

Wasting disease

Baby dropped over railing
Many of the writings are unclear as to whether alcohol effects on children were being ascribed to:

- alcohol consumption in pregnancy;
- male and/or female alcohol use at the time of conception or before conception;
- damage to genetic factors (germ cells);
- toxic damage to the fetus from alcohol-exposure in the womb (teratology);
- alcohol exposure post pregnancy;
- or even the direct feeding of alcohol, in place of breast milk, to the infant.
Sullivan 1899

• First true epidemiological study.
• Liverpool Jail
  600 children of 120 alcoholic women
  28 non-drinking relative controls
• Infant mortality 2-1/2 times higher
• Healthy children with forced abstinence in prison

*Image: the convict nursery at Brixton
1904 Ballantyne

• J.W. Ballantyne, in the 1904 *Manual of Antenatal Pathology and Hygiene*, divided pregnancy into the germinal, embryonic and fetal stages.

• He noted that alcohol can act in all three phases causing:
  - *structural abnormalities* in the first phases,
  - And, *spontaneous abortion*, and *premature labor* in the latter two.
During the Temperance period of the late 19th and early 20th century, Temperance organizations mounted extensive campaigns citing research findings from early investigations on the adverse effects of alcohol, including those related to adverse fetal outcome, in their effort to legislate Alcohol Prohibition.

Much literature including journals, brochures and posters were published by these organizations conveying findings from early epidemiologic studies of alcohol on pregnancy.

FOR EXAMPLE…….
W.C. Sullivan, M.D. 1906

“Alcoholism”
Laitinen XII
International Congress on Alcoholism, 1909

“Statistics of 19,519 children in 5,735 families”
In many American and European Countries these efforts resulted in the establishment of Prohibition for a period of time:

- Russia (1914 – 1927)
- Canada (1917 – 1927)
- **United States (1919 – 1933)**
- France (1916)
- Iceland (1915-1922) – beer was still prohibited until 1989
- Norway (1916–1927)–fortified wine and beer also prohibited from 1917-1923
- Hungary (1919)
- Finland (1919-1932)
Alcohol and Pregnancy Attitude After Prohibition

In the post-Prohibition period there was a scholarly rejection of any information that had been used earlier to argue for Prohibition:

- “...the idea of germ poisoning by alcohol in humans may be safely dismissed..., Jellinek, E.M., and Jolliffe, N. Journal of Studies on Alcohol. Vol. 1, Number 1, pg 110-181 (1940)

- ...mental deficiencies are due to “poor stock” of alcoholic families. Alcohol Explored, Haggard and Jellinek, 1942

- Mark Keller (1955) “the old notions about children of drunken parents being born defective can be cast aside...”*

* Popular Pamphlet #3, Rutgers Centers for the Study of Alcohol
Given the accepted safety of alcohol with respect to pregnancy, it is not surprising that the danger of using alcohol in a new obstetric procedure would be missed.

In the mid-1960s the use of very high dose alcohol to treat threatening pre-mature labor – the “alcohol drip” was introduced.


The medical acceptance of alcohol use in obstetrics likely contributed to the delayed recognition of FAS and FASD.
Recognition of FAS

• The pattern of deficits that we now recognize as FAS was first reported in the scientific literature in 1968 by a French pediatrician, Paul Lemoine, but no attention was paid to his report.
• In 1973, two American pediatricians (Ken Jones and David Smith) also observed this pattern in children of women who had consumed alcohol heavily during pregnancy.
• They introduced the term “fetal alcohol syndrome.”
Recognition of FAS

• This name helped to bring more focus to FAS,
• But in addition, research supported by what was then a new federal government institute, NIAAA, was able to support the research to confirm the existence of FAS and what would later be called FASD.
• Following a research conference in early 1977, NIAAA issued the first Health Advisory on alcohol use in pregnancy:
Health Advisory: Fetal Alcohol Syndrome

“Recent research reports indicate that heavy use of alcohol... during pregnancy may result in... The Fetal Alcohol Syndrome.”

“Given the... evidence available... pregnant women should be particularly conscious of the extent of their drinking. While safe limits are not known... risk is established... above 6 drinks per day....”

Recommended not more than 2 drinks per day.

June 1, 1977
In 1980, Congress recommended to the DHHS and Treasury that a new and updated advisory be issued this time by the Surgeon General.

In the 1981 Advisory, now with stronger evidence, the perspective had changed from ‘safe until proven dangerous, to advise caution until proven safe’:

“The Surgeon General advises women who are pregnant (or considering pregnancy) not to drink alcoholic beverages and to be aware of the alcoholic contents of food and drugs....” May 1981

The Surgeon General’s Advisory was reissued in 2005.
The Bottle Label Issue

Bottle Labeling Law – November 1988
Implemented – November 1989
French Bottle Warning Icon - 2007
Remaining Research Challenges
Remaining Research Challenges

• Improving detection of FASD cases through enhanced diagnostic capabilities
• Enhanced understanding of the neurobehavioral deficits in FASD to offer improved interventions for those children and adults who are affected
• Improved prevention through education and clinical management
• With 50% of pregnancies unplanned, meaning that many fetuses are exposed to alcohol before pregnancy identification -- working to change the social norms surrounding drinking behavior whenever there is a risk of a pregnancy.
Thank You!

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